

PLANNING FOR POST-INDUSTRIAL SOCIETY: A THEORETICAL FRAMEWORK

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by

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## ABSTRACT

This research stems from the proposition that important qualitative changes are occurring within Western Society, and that these changes call for new forms of individual and organisational adaptation.

Planning is a pre-eminently suitable way of adapting in an appropriate fashion to the complexities of change, rather than through ad hoc responses.

Four tendencies appear to be prevalent and to persist within what may be termed these technologically advanced societies; these are:

- high and accelerating rates of technological and social change;
- an unevenness in these rates of change, especially among different parts of the environment in which organisations operate;
- an increasing interconnectedness and interdependence among these environmental parts; and
- an increasing overall size and complexity of the environment and its constituent organisations.

System's theory, it is felt, will provide a particularly apt conceptual framework for the consideration of these problems, which will be made explicit and amplified primarily through an exploration of these concepts which are central to a theory of behavioural systems.

It is argued that the conditions in which social activity occurs are, in many parts of the world, becoming subject to important qualitative changes which demand new responses and modes of adaptation of behaviour, which look to what may be termed a new 'appreciative' outlook, in which a central element will be a recognition that units within ecological consideration must become the basis for achieving equitable outcomes.

Chapters 7 and 8 discuss planning, the method which all social units at all levels use when attempting to regulate relations with others in order to continue functioning effectively. Here, the conceptual framework will be used to examine this problem of planning. Further, to refine the notion of planning, technical, natural, institutional, economic, conflict and social systems will be examined. In particular, urban planning will be looked at as of increasingly critical concern as the result of the world urbanisation process.

A new paradigm for planning will be suggested which draws together the main elements of the thesis, in which the aims and techniques of enquiry will be from the making of explanations which derive from single purpose approaches to the furtherance of understanding desired from a more inclusive and comprehensive standpoint.

## PREFACE

This thesis is about social systems theory. It is my intention to develop a framework for analysis, and to illustrate the use to which this framework may be put by applying it to planning in general and to urban planning in particular. It is necessary, however, to "clear the ground" as it were, in order to establish why I think systems theory may be used as a tool for analysis and development rather than (say) a Marxist theoretic or a set of functionalist empirical techniques.

Firstly, I should state that I, like any other researcher, operate within a value set, that for me revolves around the notions of democracy, which has led me in my previous research to use the socio-technical systems approach, which in turn has been linked in the literature to industrial democracy at the shop floor level and the "Quality of Working Life" movement (Davis and Cherns: 1975). Between 1950 and the early 1970's the systems theory approach assumed increasing importance and considerable theoretical development took place. In my search of the systems theory literature, however, I found very little of theoretical importance had been written after 1972 although the socio-technical systems approach had continued in the industrial setting and indeed, some criticisms of the techniques used within this have appeared recently (Blackler and Brown: 1980; Kelly and Clegg: 1982).

It is difficult to account for the decline in the use of systems theory among researchers although two possible reasons suggest themselves. Firstly, there has been a reaction to the rather euphoric optimism of the 1960's, especially in terms of the decline in the world economic climate. It was felt, perhaps, that the systems approach to research, at least, in terms of the ways in which systems theory was being used, was not adequate to deal with power relations within society, especially when the changes which occurred seemed not to be foreseen by the systems theorists.

Secondly, social systems theory appeared to be "overtaken" by neo-Marxist structuralism in Europe, which did examine the problems of power relations in Western Society and this more effectively than the Humanist Marxism of Marcuse which had not lived up to its promise after the May '68 student riots in Paris.

Systems theory and Humanist Marxism had, paradoxically, something in common in that both took a somewhat subjective anti-positivist epistemological stance. Marxist structuralism, on the other hand, predicted that "truth" could be revealed through science, and the objective analysis of "deep structures". In America, there was a corresponding retreat by academic functionalists towards "hard" sociology; to statistics and empiricism, a move facilitated by the development of even more powerful, but cheaper computers.

How then can systems theory be useful as a concept for the development of further theory? I wish to argue that systems theory has, in the main, been wrongly conceived and used by

theorists, so that the criticisms which have been levelled at systems theory should really be directed towards those who have not properly understood it. For the rest of this discussion, I will develop the concept of systems following von Bertalanffy, and show that his original framework, if followed, may lead to a better understanding of the problems which beset us in the realm of urban planning.

The notion of "system" is an elusive one. Many books on systems theory do not offer a formal definition of the systems concept, and where a definition is attempted, it is usually one of considerable generality. For example, Angyal suggests that 'there is a logical genus suitable to the treatment of wholes. We propose to call it system' (Angyal: 1941: 243). Again in the words of von Bertalanffy, the founding father of general systems theory, 'these are correspondences in the principles which govern the behaviour of entities that are intrinsically widely different. This correspondence is due to the fact that they all can be considered, in certain aspects, as "systems", that is, complexes of elements standing in interaction' (von Bertalanffy: 1956: 1-2).

The notions of 'holism' and 'interaction' of parts are not exclusive to systems theory, and the skeletal definitions such as these have led many social scientists to the view that systems theory often represents little more than old conceptualisations dressed up in new and needlessly complex jargon.

The situation is, in fact, much more complex than this however. Von Bertalanffy wishes to use the notion of 'system' as a means for cutting through the substantive differences which exist between different academic disciplines. The subject matter of chemistry, physics, biology, sociology, etc., are linked in his view by the fact that they study 'complexes of elements standing in interaction', that is, 'systems'. The task of this general systems theory is to discover the principles of organisation which underlie such systems. One of his general aims is to achieve a 'unity of science' based upon 'the isomorphy of laws in different fields' (von Bertalanffy: 1956: 3).

In many respects von Bertalanffy's aim can be regarded as archetypical of the positivist perspective; it is based on upon epistemological assumptions dominated by a concern to search for and explain the underlying regularities and structural uniformities which characterise the world in general. However, his perspective differs from that of most positivists, in that he does not take his point of departure from the traditions of conventional science. Indeed, the contrary is true, and that is of major significance for this thesis. Von Bertalanffy is firmly set against the reductionism which characterises most areas of scientific endeavour, with its emphasis upon modes of enquiry based upon the methods and principles of conventional physics. He views his general systems theory as providing an alternative to this; instead of reducing all phenomena of study to physical events, he advocates that we study them as systems. His positivism is thus of a non-traditional kind and is dominated by the metaphor of 'system' as an organising concept.

Von Bertalanffy makes much use of 'the limitations of conventional physics' as a means of advocating his general systems approach. In this the difference between 'closed' and 'open' systems plays a very important part. Von Bertalanffy argues that conventional physics deals mainly with closed systems, that is, systems which are considered to be isolated from their environment. The method of the controlled experiment, in which the subject of study is taken out of its environment and subjected to various tests, provides a very good example of this. Such closed systems are characterised by equilibrium. As von Bertalanffy puts it, 'a closed system must, according to the second law of thermodynamics, eventually attain a time independent equilibrium state, with maximum entropy and minimum free energy, where the ratio between its phases remains constant' (von Bertalanffy: 1950).

Open systems are quite different, in that they are characterised by an exchange with their environment. They engage in transactions with their environment, 'importing' and 'exporting' and changing them in the process. A living organism provides a good example of an open system, since it maintains itself through a process of exchange with its environment, during the course of which there is a continuous building up and breaking down of component parts. The concept of an open system is thus essentially processual. Whilst a closed system must eventually obtain an equilibrium state, an open system may achieve a steady state, homeostasis, in which the system remains constant as a whole and in its phases, though there is a constant flow of the component materials. Such a steady state, however, it not a necessary condition of open systems.

This is a point of the utmost importance, and it needs to be emphasised. An open system can take a wide variety of forms. There are no general laws that dictate that it must achieve a steady state, be goal directed, evolve, regress or disintegrate. In theory, anything can happen. One of the purposes of open systems theory is to study the patterns of relationships which characterise a system and its relationship to its environment in order to UNDERSTAND the way in which it operates. The open systems approach does not carry with it the implication that any one particular kind of analogy is appropriate for studying all systems, since it is possible to discern different types of open system in practice.

The above point has not been clearly stressed or articulated in the literature on system theory, at least not in the systems literature. As far as most social scientists are concerned, there are two types of system perspectives - open and closed. The fact that the former encompasses a whole range of possibilities is hardly every recognised.

As a theoretical perspective in social science, the notion of a closed system tends to be avoided. Von Bertalanffy's argument that closed systems are characterised by isolation from their environment has proved overwhelmingly successful in persuading social theorists that the closed systems approach is inappropriate as a guiding principle for the conceptualising of social phenomena. Indeed, it has become almost obligatory for

social system theorists to decry the inadequacies of closed systems theorising. In the field of organisation studies for example, an attack upon the closed system thinking implicit in Weber's model of bureaucracy or classical management theory provides a convenient springboard for lauding the praises of the contemporary perspective of open systems theory.

Paradoxically, as a method of analysis the notion of a closed system is still dominant in many areas of social enquiry. The use of controlled experiments and interview programmes, and the attempt to measure social phenomena through attitude questionnaires, all provide examples of closed system methodologies based upon the assumption that the environment generated by the investigation has no impact upon the subject of study. The paradox is often compounded by the fact that such closed system methodologies are often employed within the context of theoretical perspectives which emphasise the importance of an open systems approach. This phenomenon has been termed "abstracted empiricism", (C.Wright Mills: 1959).

Abstracted empiricism describes the output of researchers who have allowed methodologies derived from the natural sciences to dominate their work. I use it here in a related but more specific and limited sense. If social science is considered in terms of a subjective-objective continuum, abstracted empiricism represents a situation in which a highly nomothetic methodology is used to test a theory which is based upon ontology, an epistemology and a theory of human nature of a more subjectivist kind. It is with regard to this incongruence that, for example, abstracted empiricism differs from behaviourism.

Skinner and other behaviourists adopt a perfectly coherent and congruent perspective in relation to their objective world view. Their engagement in the wholesale use of experimental and other research methods derived from the natural sciences is consistent with the nature of their theorising. Abstracted empiricism arises in situations where the methods used are inconsistent with the underlying theory. Within this thesis I have attempted to be ever mindful of this problem, and in discussing urban planning I attempt to maintain a methodology which does not retreat to nomothetic views.

Despite the widely recognised deficiencies of the closed system as a theoretical construct in social science, the full implications of an open systems approach have not been pursued in any depth. The concept has been adopted in a very partial and often misleading way. For many theorists, the adoption of an open systems perspective has been a very limited venture, confined to recognising and emphasising the environment as an influence upon the subject of study and reformulating traditional models in terms of systems concepts. More than anything, the call to adopt an open systems approach has been interpreted as a call to take heed of the environment and often little else. As Buckley has noted, "though there is a fair amount of superficial (and often incorrect) use of the newer terminology (it is almost de rigueur to mention "boundary maintenance", input-output, "cybernetic control" (sic), feedback and the like), the underlying conceptions show little advance

over the mechanical equilibrium model of earlier centuries' (Buckley: 1967: 7).

The majority of systems models used in the social sciences tend to be based upon mechanical and biological analogies, through in recent years increasing attention has been paid to cybernetic models as a basis of analysis. The mechanical models have been derived directly from the physical sciences and tend to be underwritten by the assumption that the system has a tendency to achieve an equilibrium state. Since, as I have already noted, equilibrium is only possible in closed systems, does this imply that all theorists using mechanical models are working upon closed system principles? To the extent that most of these theorists recognise the influence of the environment, the answer is no. Though adhering to the underlying concept of equilibrium - albeit mistakenly in theoretical terms - they modify their analysis to allow for the fact that disequilibrium is a very common feature of the system; or that the situation is one of dynamic equilibrium, with the system moving from one equilibrium state to another; or that the system is characterised by homeostasis. All these three strategies can be understood as attempts to save the notion of equilibrium as an ongoing concept in open systems situations where it is fundamentally inappropriate. Homeostasis is an acceptable open systems concept, but it applies an organismic as opposed to a mechanical analogy as an organising principle.

Mechanical models of open systems, therefore, tend to be characterised by a number of theoretical contradictions and are thus of very limited value as methods of analysis in situations where the environment of the subject of study is of any real significance. Environmental change is of principle significance as a source of disequilibrium. The possibility that environmental change may influence the very structure and essential nature of the system is negated to some extent by assumptions that equilibrium will eventually be resolved. The use of a mechanical equilibrium analogy thus severely constrains the openness of the system under investigation.

Similar problems relate to the use of biological analogies in systems analysis. Since von Bertalanffy's advocacy of the merits of an open systems approach, the choice of a biological organism as a model for systems analysis has proved increasingly popular and has more or less replaced the older mechanical analogies. Indeed, the biological analogy of an organism - with its emphasis upon characteristic features such as energetic input, throughput and output, homeostasis, negative entropy, differentiation and equifinality - has often been equated with the open systems approach per se. Von Bertalanffy's enthusiasm for illustrating the open systems notion with analogies drawn from biology, his former discipline, has led many social systems theorists to confuse what was intended as an illustration with a point of principle. For many, the adoption of an open systems approach has been equated with the adoption of an organismic analogy as a basis for analysis. I wish to argue later that this represents but one of a number of possible open systems analogies.

Now of particular importance as far as the organismic analogy is concerned are those which imply that the system has 'needs'; that these are necessarily geared to survival or homeostasis; and that the subsystems contribute to the well-being of the systems as a whole. The notion that a system has needs which must be fulfilled and the notion of functional unit both derive directly from the use of the analogy of the biological organism for the study of society. The notions of homeostasis and survival are characteristic of biological analogies at the level of both the organism and of the species.

As in the case of the mechanical equilibrium systems model, the use of the organismic analogy constrains the manner in which the system is viewed in relation to its environment. Firstly, the system, like an organism is cast in a responding role. Despite the fact that the relationship between system and environment is seen in theory as one of mutual influence, the organismic analogy encourages the view that it is the environment which influences and the system which responds. The emphasis is upon the environment acting upon the system rather than the other way around. Secondly, the organismic analogy tends to presume a relatively stable system structure. The system responds through recognisable channels, the constituent elements of which have a function to perform within the context of the system as a whole. Thirdly, the general nature of the response is seen as being determined by the 'needs' of the system. These needs act as a reference point for interpreting the activities of the system as a whole. Full openness, however, requires that the system be allowed to act unfettered by such assumptions.

Walter Buckley (1967) has provided a critique of the inadequacies of conventional models used in social science. He argues that in the realm of human activity it is the morphogenic nature of social arrangements which is all important, and that systems models adequate for the task of analysing these processes need to be adopted. Buckley's morphogenic view of society takes him away from the majority of more conventional social systems theorists, in that he sees social structure as emerging from the process of social interaction. Thus his morphogenic view does not emphasise structure at the expense of process, nor is his scheme concerned to provide explanations of social affairs which are geared to providing explanations of the status quo. Buckley, following Radcliffe-Brown's view that 'the social structure as a whole can only be observed in its functioning' is not constrained by any adherence to the organismic analogy. His morphogenic system theory is thus subjectivist.

Buckley's analysis opens up new horizons as far as systems theory in social science is concerned. It illustrates that systems analysis need not be confined to the use of a particular kind of well-worn analogy, such as that of the organism. Other choices offer themselves for consideration. Cybernetics models for example, seek to cut through the substantial differences which exist between machines and organisms, in an attempt to focus upon common organisational principles which define the nature of self-regulating systems. Such models offer a useful alternative to the traditional social system analogies in

situations where the study of social regulation or social engineering is a primary concern. Other analogies also offer themselves as a basis for systems analysis. If the concern is to study situations in which conflictual relationships tend to predominate, then an analogy which emphasises that the system has a tendency to break up or divide may be more appropriate. "Factorial" or "catastrophic" systems models may provide a better explanation of the subject under study. One of the central problems facing the systems analyst is that of choosing an analogy which reflects the basic nature of the phenomena to be investigated.

The emphasis of my discussion here has been placed upon the fact that systems theory is not linked to the use of any one particular analogy. The fact that more applications have been based upon the mechanical and organismic models, especially the latter, has often disguised the fact. The focus in my approach to systems theory, hopefully exhibited within these pages is upon the way in which a system is organised internally and in relation to its environment. This approach seeks to penetrate beyond the substantive nature of the machine, organism or whatever to reveal its principle of organisation. Systems theory is about organisation - the organisation of "complexes of elements standing in interaction", to use von Bertalanffy's words (1956: 2). The automatic selection of one particular kind of analogy presumes a specific kind of structure and concomitant pattern of information process, exchange, behaviour and the like. The selection of a particular type of analogy to represent a system in advance of a detailed analysis of its structure and mode of operation is akin to prescription in advance of diagnosis. This has been the principal problem with systems analysis in social science. Social theorists have generally reached for some simple mechanical organismic analogy in advance of any study of the system to which it is applied.

Nowhere has this problem been more evident than in the realm of urban planning, which I shall use to develop a contrary theme to that of the neo-Marxist structuralists who have become more dominant as the systems approach has been in retreat, (which is not to say that I shall be dealing with Marxist structuralism in my thesis). None-the-less, some mention should be made of this approach at this juncture.

Briefly, within urban planning, the work of the Neo-Marxist structuralists has found its most forceful expression in the work of Castells, who takes his epistemology and his structure of analytical concepts from Althusser, and his political theory from Poulantzas. He has attempted to clear the way conceptually for the development of a scientific analysis of the urban question. Castells then takes a highly objectivist view to urban sociology. For example, he asserts that "a science either general or particular which has neither a specific theoretical object nor a specific real object does not exist as a science" (Castells: 1976: 60). Now it is difficult to know what he means by this, but I take it to reflect his objectivity, particularly as he also maintained that the development of the city as a unit of collective consumption could not be explained in terms of the actions of individual subjects, as "transformations of

space must (thus) be analysed as specifications of transformations in the social structure" (ibid: 78). For Castells, urban sociology, in failing to be either a specific theoretical object or a specific real object cannot be considered as a science but as an ideology. Needless to say, he finds both of these objects in his own work stating the "real object" to be the "city" as a spatial unit of collective consumption, and the "theoretical object" the "city" as a residential unit of "labour-power" (ibid: 48).

Having thus defined both the "real object" and the "theoretical object" of a scientific urban sociology, Castells was in a position to develop a class analysis of urban problems (defined as problems of collective consumption involving the reproduction of labour-power). Urban problems, he declared are "in advanced capitalism .... the focal point for new forms of class struggle" (ibid: 147) and it is therefore necessary to understand urban politics scientifically.

This semantic taxonomy may be scientific but Castells becomes enmeshed in obtuse arguments and undefined terms (Pickvance: 1976; Saunders: 1981; Dunleavy: 1980; Elliott and McCrone: 1982). This is not to dismiss Castells' contribution but this high degree of abstraction serves not to enlighten us as to how urban sociology in general and urban planning in particular is to proceed.

I deal, in some detail, with the objective functionalist flight to statistical techniques in the main body of the thesis, but suffice it to say at this stage, that this flight also involves abstraction and the removal of the urban planner from the domain of public debate to the realm of the expert.

How then, may social systems theory bring urban planning back to the public realm and within the democratic process? This is the problem for this thesis. In Chapter 1, I discuss the environment in terms of planning and social change. Chapters 2 and 3 develop the concepts of systems and the systems/environment interface. Chapter 4 deals with the problem of how systems adapt to their environment while Chapter 5 begins the discussion on planning. In Chapter 6, the planners' expanding horizons are considered and Chapters 7 and 8 take us away from strategic activity in the abstract and discuss urban planning as an example of an area where the notion of appreciative management may be applied. Finally, in Chapter 9 I put forward some recommendations and suggestions for their implementation.

## TABLE OF CONTENTS

	PAGE
CHAPTER ONE	
PLANNING AND SOCIAL CHANGE	1
Dimensions of Change	2
Symptoms of Turbulence	32
CHAPTER TWO	
SYSTEMS THEORY	57
Systems Theory as a Framework	58
Contextualism	68
Other Approaches to Systems Thinking	70
Functionalism and Systems Theory	71
Formism	72
Systems Theory and the Concept of Purpose	74
Open Systems	77
Systems as Instruments	82
Collectivities	84
CHAPTER THREE	
ENVIRONMENT AND SYSTEM BEHAVIOUR	90
Environment and Behaviour	91
Perception	94
Limits on Activity	95
Mechanism and Vitalism	100
The Importance of Context	101
The Causal Texture of the Environment	103
The 'Whole Situation'	110
The Geo-Behavioural Environment	112
Goal Objects and Noxiants	114
Environments	116
CHAPTER FOUR	
ADAPTATION OF SYSTEMS TO THEIR ENVIRONMENTS	130
A Concept of Adaptation	131
Man and Environment	133
Directive Correlation	135
Passive Adaptation	138
Coenetic Variables	139
Active Adaptation	141
Ecological Adaptation	144
Environmental Complexity and Adaptation	147
Maladaptive Responses to Turbulence	160
Pathologies of Integration of the Depth Dimension	171
Pathologies of Integration on the Means-end Dimension	174
Pathologies of Integration on the Lateral Dimension	177

CHAPTER FIVE	
STRATEGIC PLANNING	183
Strategic Planning and the Social Sciences	186
The Future as the Planners Environment	193
Planning: The Active Adaptations of Purposeful Systems	216
 CHAPTER SIX	
STRATEGIES FOR THE "SOCIOSPHERE"	236
Planning's Expanding Horizons: The Sociosphere	237
The Subject Role of the Sociosphere	254
The Object Role of the Sociosphere	261
Some Implications for Societal Planning	273
 CHAPTER SEVEN	
URBAN STRATEGIES SOME PROBLEMS	277
Urban Planning and Urban Planners: The Background	279
The Current Urban Crisis: Cities in Turbulence	293
The Metropolis	296
The Problem of Growth: The Turbulent Environment	302
Interdependence of Systems	304
Recapitulation: The Need for New Strategies	305
Maladaptive Responses	307
Superficial Responses	311
 CHAPTER EIGHT	
STRATEGIC PLANNING: A NEW PARADIGM	330
From "City" to "Urban Field"	337
The Community	342
From Mobilisation of Power to the Institutionalisation of Values	349
Planning: From Product to Process	361
A Methodology	370
The Planner's Role: From Master to Midwife	372
 CHAPTER NINE	
RECOMMENDATIONS AND IMPLEMENTATION	381
 BIBLIOGRAPHY	395

CHAPTER I

PLANNING AND SOCIAL CHANGE

DIMENSIONS OF CHANGE

This study is premised on the proposition that the social fields of advanced industrial societies, considered as the milieu for the purposive social behaviours of individuals, groups and organisations, are becoming subject to important qualitative changes in their structure and dynamics, changes which will necessitate new forms of individual and organisational adaptation. These changes appear to be a function of four prevalent and very persistent tendencies operating within the advanced industrial societies: (1) high and accelerating rates of technological and social change; (2) unevenness in the rates of change among the constituent parts of the field; (3) increasing interconnectedness and interdependence among these parts; and (4) increasing overall size and complexity of the social field.

While these changes are a function of the transformation of industrial society, there is little consensus as to the form of society that is emerging. Of the designations that have been popularised, a number have given special emphasis to a limited facet of the developing societal structure. 'The affluent society' and 'the atomic age', now less fashionable than 'the service state' and 'the electronic age', are designations of this sort.

Brzezinski's 'technetronic era', Boulding's 'post-civilised society', and Toffler's 'super-industrial society' are more encompassing terms, and analysis reveals a good deal of overlap

amongst them. Here, however, the term popularised by Daniel Bell, 'post-industrial' society, is preferred.<sup>1</sup> Its advantage, as Trist (1972:157) has pointed out, lies in the implication of its metaphor:

that we may not assume that the present social order will continue indefinitely; rather must we prepare ourselves to assist the emergence of a society radically different from the industrial societies which have evolved in the last two hundred years - whether these remain substantially capitalistic or have taken on either a mixed or a socialistic complexion.

In other words industrial society was characterised as a manufacturing society, dominated by the production systems of secondary industry, the development of which is geared to the exploitation of natural resources and a system of trade considerably dependent upon international relations (Toffler 1980). It was a system in which most of the important roles are occupied by adult males - as workers, decision-makers, and 'bread-winners'; and in which families, as a consequence, was 'nucleated'. In such a society, the state has three fundamental roles: to create and regulate the conditions under which production and productivity can be maintained; to provide for a comprehensive education system that was capable of meeting the necessary manpower requirements; and to provide for the casualties of industrialism - the poor, the sick, the aged, and so on.

On the other hand the concept of post-industrialism challenges the prevailing unreflective assumptions of the relative permanence and stability of these roles has implications for our personal worlds. But particularly it challenges the concepts of

planning that have been developed and applied in industrial society, for planning has a special concern with trying to anticipate the shape of the future. If, as we believe, industrial society is undergoing a radical transformation, then it is certain that our attitudes towards planning and methods of undertaking it are going to require revision. In fact, as will be discussed, such a 're-think' has already begun.

The first part of my argument is applied to describing the transformation that is taking place and putting forward an interpretive framework. The second part applies this framework to planning activity and tries to formulate a new concept of planning that is appropriate to the conditions that are emerging in society.

In discussing the nature and the dimensions of the changes that are taking place (in particular, those changes which have significant consequences for a social system's efforts to plan its future), the concept of social field has been adopted in preference to the concepts of society or social structure, although of course these terms are used. The field concept conforms to the 'world hypothesis' of contextualism, for which the 'root metaphor' is the historical event or act (Pepper: 1942). Contextualism's basic categories are contexts or complexes, which, as explicans, are taken into consideration from whatever source they come and are interpreted one by one, as they occur. The 'world hypothesis' to which the field concept conforms is synthetic and dispersive, standing in direct contrast with the mechanistic world hypothesis, which is

analytic and integrative, but differing also from the organicist and formistic hypotheses (Pepper's four 'world hypotheses' are also discussed below).

The essential reference of the field concept is topological, and it leads to the interpretation of events and processes in terms of such genotypical properties as position, force, direction, velocity, mass, barrier, and so on - properties that are descriptive of the structure and dynamics of the field. The concepts of society and social structure that have developed in sociology and anthropology do not tend to lead to interpretations of this sort, but promote instead a mode of interpretation that is constrained by 'classificatory' thinking and order; to entities rather than events as the basis data.

This is especially true of both mechanical and organic models of society, which, when taken at all literally, tend to exclude any means of interpreting and articulating the processes of mediation between the main structural components the entities - and the parts of which they are constituted; between the social group and the psychological individual (Burrell, G. and Morgan, G. 1978). The undoubted success of such models in understanding machines and organic life is no guarantee at all of their utility in understanding social systems, whose constituent parts are not only dynamic and animate, but are, in themselves, purposeful.

Certain widely accepted sociological concepts are readily assimilable to the field-theoretic approach - the in-group

versus out-group distinction made by Sumner, Cooley's distinction between primary and secondary groups, and the more recent concepts of reference group and relative deprivation, for example. Many others are not readily assimilated - the categories of upper, middle and lower class used in stratification studies (Marx's bourgeoisie and proletariat are, by contrast, dynamic concepts), the church-sect typology; the distinction between formal and informal organisation theory for example. Where possible, field-theoretic terms will be used throughout, in preference to 'Aristotelean', class-theoretic terms.

Although the basic analogue for a field theory of social behaviour may have been mechanistic in origin (the gravitational and electro-magnetic field of physics), its fullest development in the behavioural sciences, in the work of Lewin (1935, 1936) and Brown (1936) is wholeheartedly contextualist in character (Capra: 1978). Lewin's topological psychology and his concept of life-space presented the psychological field as a spatial construct, a region, to which my descriptions of psychological behaviour can be ordered. The social field is a methodologically equivalent construct for ordering sociological and socio-psychological behaviour.

The social field precedes and endures beyond the individual life-time, coming into existence for the individual with socialisation or with confrontation. The individual is a carrier of the field in the collectives of which he becomes part - family, community, formal organisation, nation and so on, but

membership of these collectives alters the field for him and for the other members. The strength of an organisational 'philosophy' of class consciousness or group cohesion is, thus, to an extent a measure of the degree to which the social field is unified for a collection of individuals, the extent to which a given social field is shared. The social field exists only in and through individuals, but because of its pervasiveness and persistence (its spatio-temporal expanse and its historical duration) it achieves a phenomenological independence as the 'ground' on which social life is sustained, a relatively stable domain within which the effects of action and interaction are calculable to a degree that permits the maintenance of social order.

The social field is not to be thought of as simply a passive medium however, a backcloth against which social behaviour is acted out. It is a region in which all the points have positional value of direction and magnitude, and in which the total distribution of forces determines the value of positions within it. Behaviours available to the organism, individual, or group, are not, therefore, freely variable, but are contained by the properties of the field as a whole. The goals to which activity is directed, and the strength and persistence with which goals are sought, are not determined solely by the actor, but are jointly determined by the actor and the structure and energy distribution of the field. Global characteristics of the relevant field, such as its degree of stability or instability, homogeneity or heterogeneity, its overall size and complexity, and the degree of interdependence between its parts, (as well as

the more localised texture of the immediate action situation), influence the choice, structure, and success of behaviours.

Nor is the social field not simply a spatio-temporal distribution of persons and objects, but is a region of social and psychological forces which direct and constrain the striving and avoidance behaviours of individuals and collectivities. Individuals and social collectives may, therefore, be implicated in fields from which they are geographically distant. Both love and enmity between persons can endure across oceans and across decades. The espionage agent in a foreign land, the infantry patrol behind the enemy lines, the commercial salesman out of his territory - each of these is responsive to field forces which emanate from the distant 'base', as well as from the immediate situation that is confronted. The full power of forces such as these is most completely experienced by those who try to escape them - the political defector, the deserter and the escaped convict.

Equally, the field may be reduced to insignificance, or even go out of existence for actors physically present in its midst. Thus, total institutions, such as monasteries and mental hospitals, can erase the extended social field outside the institutional boundaries and localise the experiential world of their inmates almost entirely within their confines. For individuals, the experience of immense loneliness within a large and busy city is a classic example.

The field concept is radically a-historical, and, in this respect, represents a starting point quite different from the concept of society. Only those forces actually operating on the person or the group in the present are held to be capable of having effects. The social field, like the life-space, does, however, have a forward and a backward reference; so that events which have happened and events which are yet to occur or are anticipated may have effects in the present. Just as past traumas and cherished ambitions operate as contemporaneous forces in the life-space of the individual, so too do past experiences which have been shared by many people, (through world wars and economic depressions) and shared anticipations about an outcome (for example, of a general election) enrich the quality of social fields, by incorporating elements of the past and the future.

In general, the extension of the social field cannot be represented categorically; it can only be represented relationally. It is a function of the way in which the constituent parts are interconnected with other parts - their comprehension of their own dependence upon the behaviours of other parts and of the ways in which their own behaviours influence the behaviours of other parts. In some instances, therefore, the social field may transcend national boundaries; in other instances it is included within them. Jet-set connotes at least an embryonic social field that is supra-national, and aspects of social fields that are conditioned by world religions similarly extend across societal boundaries. The main intra-societal differentiation in modern society tends to be

between urban and rural fields, but many other regional, functional and cultural differentiations exist.

Transformation of the social field thus refers to changes in the structure and the dynamics of the social and psychological environments in which the behaviour of groups and individuals takes place. Just as with gravitational and magnetic fields, the global properties of the social field - the overall distribution of forces - influences all activities within the field. My main purpose in attempting to understand the current transformation of social fields in highly industrialised societies is to investigate the implications of this transformation for, in particular, planning activity.

I now return to a discussion of the four main dimensions of the transformation that I identified at the beginning.

### 1. Acceleration of change

Large-scale and continuing technological change has become ubiquitous within western societies. The internal logic of machine-based production systems geared to an expanding free enterprise market, has entailed a heavy and rising investment in technological innovation as a means for the survival and expansion of economic enterprises in the face of constant competitive challenge. We have long since learned to live with change. The essential novelty that we now have to come to terms with is the accelerating rate of social change, in a number of key areas of contemporary social systems. As David Loeks has put it:

There is an increasing awareness that man now stands well past the threshold of a universally urbanised, industrialised, technologically sophisticated world. The nature of his response to these circumstances is and will be dominated by the overweening fact of accelerated change: unprecedented, explosive, and for the foreseeable future at least, continuing. (Loeks: 1967:347)

Statistics relating to per capita consumption of energy, car ownership, computer speeds and capacities, average standards of living, productivity of labour, proportions of a society in the 'learning force' - all these, and thousands of other dimensions, combine to suggest that the industrialised societies are not merely climbing a gradient, but are mounting a steep and sharply rising curve, with respect to the material means of life.

The twentieth century marks the middle period of a great transition in the state of the human race. It may properly be called the second great transition in the history of mankind. The first transition was that from precivilised to civilised society which began to take place about five thousand years ago... (The second) may be called the transition from civilised to post-civilised society.

Part of the evidence is that:

...as far as many statistical series related to activities of mankind are concerned, the date that divides human history into two equal parts is well within living memory. (Boulding: 1964:1-2)

Individually apprehended, trends such as these do not unduly impress or disturb. In combination however, they are both reflected in, and are a determining factor behind, some of the massive structural shifts that are currently threatening to engulf our major social planning institutions. The emergence of government as the biggest capitalist of all, a massive employer and the main dispenser of social welfare, has created

fundamental problems concerning the relations to be developed between government and industry, the political system and the economic; and is thrusting a new responsibility upon the administrative arm of governments, commensurate with increasing governmental power.<sup>2</sup> Deeply ingrained assumptions bearing upon the 'natural' life cycle of family dependency, education, marriage, employment and eventual retirement require modification as mass secondary education and the advent of 'continuing' education shift the balance of numbers between the labour force and the learning force in favour of the latter; as the service sector takes over from manufacturing as the predominant employer of labour; the balance of work to leisure time alters; as 'non-linearity' of educational and career lines becomes possible with the expansion and diversification of education, the general attainment of higher levels of basic education, and the greater ease of geographical and occupational mobility.

Finally, and perhaps most dramatically, the accelerating pace and scale of urbanisation, crystallised in the unprecedented growth of the world's cities, epitomises, in material form, the dominance of man over nature in which all technology plays a part. Here, as in many other areas, the obsolescence of concepts is testimony to the pace of change. 'Town and country planning' may have been a brash and imaginative designation in its day, but as a conceptual tool for approaching the contemporary tumult of London or Chicago it appears quaint. City has been supplanted by connurbation and, subsequently, by megalopolis in order that we may conceptually encompass the new

dimensions of the urban phenomenon: more recently still, the notions of ecumenopolis and urban field encourage an even wider view of the urbanisation of the world.

Alvin Toffler has coined the term 'future shock' to refer to the psychological bewilderment and disorientation that may affect individuals, groups and entire cultures when the rate of change in their environments outstrips their adaptive capacities:

Future shock is a time phenomenon, a product of the greatly accelerated rate of change in society. It arises from the superimposition of a new culture, on an old one. It is culture shock in ones own society.

The concept of future shock....suggests that there must be balance, not merely between the rates of change in different sectors, but between the pace of environmental change and the limited pace of human response. For future shock grows out of the increasing lag between the two.

(Toffler: 1970:13,5)

In associating his concept with the parallel term, 'culture shock', he argues that the culture of the future is likely to be so radically different from the present (and, at the same time, will invade the present so rapidly) that the effect on individuals and groups will be directly analogous to that of a lateral shift between two existing, but quite dissimilar, cultures. His concepts and his intuitions correspond encouragingly with the concept of 'turbulence', which has been subject to a quite separate development during the last decade, and particularly in the identification of accelerating rates of change as a major contributory factor in the emergence of novel social environments.

## 2. Unevenness of change

The second contributory factor augments in a significant way the impact of accelerating change per se. The unevenness of change rates across the manifold segments and dimensions of extended social fields widens the range of opportunities between differently situated groups, thereby supporting tendencies towards social segmentation and creating wider possibilities for sentiments of 'relative deprivation', as more groups perceive themselves as disadvantaged compared with the standards of welfare of the more rapidly advancing parts of the system. It is useful to distinguish two component effects of differential change rates among the parts of a complex and dynamic system. One result is the structural effect of differentiation per se, revealed as an increasing heterogeneity of the system as a whole. Thus freshmen classes and recruit intakes at a military induction centre begin as relatively homogeneous groups, which subsequently differentiate over time with respect to criteria of educational attainment and leadership ability. The second component is the processual effect of 'friction', which can be expected to occur wherever contiguous parts of a system move at differential speeds or in different directions. Differentiation engenders segmentation, and creates problems of the co-ordination and regulation of parts; 'friction' engenders conflict, tension and resistances creating problems of conflict resolution and tension reduction - i.e. social and organisational 'lubrication'.

The manifestations and consequences of uneven change rates among the parts of societies have become the daily fare of the mass

media, though they naturally favour reporting the conflicts and the abrasiveness which arise from differential change, and are inclined to leave the 'mapping' of social segmentation to the statistical bureaus and the academic world.

The reality of a widening generation gap has become more and more conspicuous since the Second World War, to the extent that a generational 'bi-culturalism' can be discerned in the technically advanced societies. Dominant societal issues in the United States, such as integration and civil rights, the draft, and the role of the universities, have reverberated throughout the western world and have become the catalysts of a broad age polarisation. And, it is in the moral area, of individual and social values, where the cleavage is most directly experienced in the contemporary world. The phenomenon castigated as 'permissiveness' by older people is embraced as 'self-actualisation' by the young. The life experiences, values and expectations of the young and the old are geared to different futures. The dimensions of the divide as well as some of its consequences, are being recorded for posterity by the judiciary, for, in the transcripts of trials hearing charges against anti-war protestors, draft resistors and the publishers of underground newspapers one finds encapsulated the clash of radically different, generation-based value systems.

Uneven change rates are discernible, too, between the 'permanently disadvantaged' poor and the affluent masses, between the whites and the blacks in America; between the developed and the developing nations. As far as their means of

existence are concerned the populations of outlying rural districts are vulnerable to becoming 'trapped' in the same manner as the disadvantaged, 'ghettoised' minorities in the cities, and welfare agencies have found the problems of both groups difficult to meet in an effective way. The recent 'insurrection' of French agricultural workers and the conflict in Northern Ireland (which has attained the proportions of civil war), are each symptoms of friction between groups which are advancing materially at different rates - farmers and industrialists, Catholics and Protestants.

Much has been written about the structural handicaps of pre-industrial societies attempting to accumulate sufficient surplus resources for the investment necessary for economic 'take-off'. A few, such as Mexico and Israel, seem to have got over the 'hump', with the assistance of heavy foreign aid, but there are dozens of other societies still struggling to provide a basic subsistence for their expanding populations (e.g. India), or stalled at the point where they can produce enough to keep pace with population growth but not enough to be able to tool up for industrialisation (e.g. Indonesia).<sup>3</sup> The crises latent in this state of affairs are described by Horowitz:

Destitution, malnutrition and distressingly low standards of living are aggravated by sociological and psychological conditions. The 'demonstration effect' of modern civilisation and of standards of living superior to those of the overwhelming majority of the people in underdeveloped countries is conveyed to the latter by the media of mass communication - radio, motion pictures, etc. The socio-political repercussions of the gap between the two major areas of the world, that is to say, between the industrialised and the underdeveloped areas; are thus magnified.

The industrialised sector now faces the urgent challenge of either mitigating those politically explosive frictions and antagonisms, or of taking the consequences, which may be serious. A new approach to the interrelationship between the developed and the underdeveloped parts of the world has become inevitable. The affluent sector of the world cannot remain a quiet island in the midst of a stormy ocean, an oasis of prosperity in a desert of desperate poverty. (Horowitz: 1966:5)

There is one dimension of societal development imbalances which seems, in a significant way, to lie behind the more specific manifestations. It is located in the apparent paradox that, while scientific advancement, and its translation into technology, has created the potential for a world of plenty, and has put the natural order at our feet, the welfare (and even the survival) of a vast proportion of the world's population is as seriously threatened as at any other period in history. Elting Morison has put it this way:

....we may be caught in the irony that at the very moment when by our wit we have developed the means to give us considerable control over our resistant natural environment, we find we have produced in the means themselves an artificial environment of such complication that we cannot control it.  
(Morison: 1966:209)

Basically the fault seems to be that our knowledge grows faster than our ability to use it; our decision-making institutions have been outdated by the growing complexity and unpredictability of the phenomena about which decisions have to be made:

For many years our technological knowledge has been rapidly outpacing our decision-making institutions... Until the 19th century, society usually showed great capacity for assimilating new scientific and technological information and putting it to rather wide use. Among the novel social

adjustments to new knowledge were, for example, the limited-liability corporation, central planning units, the mass-democratic state, independent regulatory commissions, and professional managers. However, the technologies and theories of most of the older scientific knowledge did not deal directly with the central institutions and values of society.... It is modern science that has made the relationship between knowledge and social action a radical problem...

I can see only a continuously accelerating rate of innovation in most branches of science. The knowledge these innovations will create will be able either to destroy mankind physically and socially or, if used to our best advantage, to lift mankind to new heights of individual and social existence. The problem of integrating knowledge and social action is therefore becoming both more difficult and more critical.

(Dror: 1968:3-5)

It is perhaps not too immodest to suggest (as does Wiener: 1978:Ch.1) that social science understandings are now urgently required to redress the balance between our technical capacity and our social, political and economic wisdom.<sup>4</sup>

Again the United States offers the most poignant examples, but they are descriptive of a general characteristic of advanced industrial societies. The nation that has awed the world with the technical triumphs of the Apollo moon missions, pioneered the revolutionary "Planning-Programming-Budgeting-Scheduling" system in government administration, and successfully devastated vast tracts of the Vietnamese landscape with its highly sophisticated armaments and "delivery systems", has not been able to develop the social and institutional controls needed to handle the problems of waste and pollution and restore sanity to the problems of movement in the cities. There is no longer even a clear conception of "victory" to guide the war machine.

Insofar as the 'lag' involved here is in the maturity of our institutional arrangements for decision-making, policy-making and planning, then we need some kind of organisational revolution in order to overcome traditional bureaucratic thought-modes, the legacy of early forms of mass production and professional civil service and the influences of Taylor and Weber. If our understanding and control of nuclear fission can be replicated for planning and policy-making, then this basic component of unevenness of growth will have been substantially removed.

My use of the concept of 'lag' draws attention to a much earlier appreciation of the significance of uneven development. William Ogburn first used the concept of 'cultural lag' in 1914, developed the idea into a theory in the following year, and published it in his Social Change in 1922. In that work he writes:

The thesis is that the various parts of modern culture are not changing at the same rate, some parts are changing much more rapidly than others; and that since there is a correlation and interdependence of parts, a rapid change in one part of our culture requires readjustments through changes in the various correlated parts of culture.  
(Ogburn: 1950:200-201)

Commenting much later on his early work, he further explains that:

A cultural lag is independent of the nature of the initiating part or of the lagging part, provided that they are interconnected. The independent variable may be technological, economic, political, ideological, or anything else.  
(Ogburn: 1964:91)

The appearance of technological determinism in his earlier writing he ascribes to the fact that: "In our times in the western world, technology and science are the great prime movers of social change. That this is so is an almost universal observation." (Ogburn: 1964:91)

I have noted above that unevenness of growth must be viewed as augmenting the effects of rapid change itself. More than 30 years after he first developed his theory, Ogburn writes:

The application of the theory to modern times suggests a possible appendix to the theory which runs like this: the number of patents, discoveries in applied science, and inventions has been increasing in something like an exponential curve. Most of these are minor; but important ones have been coming very rapidly... As these discoveries and inventions are adopted, we must adjust to them; we must adapt ourselves to this changing environment, but we do it with a certain amount of lag. So an addendum to the theory of cultural lags is that lags accumulate because of the great rapidity and volume of technological change.  
(Ogburn: 1964:92)

We should perhaps note that Marx's dialectical materialism already contained the core ideas of structural lag and its consequences for a social system. In fact, the thesis occurs in Marx in its most exaggerated form. His radical dichotomisation of 'the parts of culture' and emphasis of the fundamental connection between them (that of their relations to the means of production) distils the essential idea of the consequences of differential growth rates. The material advance of the bourgeoisie, and its exploitation of the proletariat, culminating in the working-class revolution, is a model of the ideas with which I have been concerned.

### 3. Increasing interdependence

A third aspect of the current transformation of social fields is the increasing ecological interdependence among the parts of the field, which seems to be primarily due to the related processes of increasing functional specialisation of the parts, and dramatic extensions in the scope and rapidity of inter-species communication. A revitalisation of interest in human or social ecology and the development toward maturity of ecological psychology reflect an awareness of this transformation and provide some of the essential concepts for its comprehension.<sup>5</sup> While giving more and more attention to ecological problems, it may be as well to emphasise the distinctiveness of social ecologies.

Man, as the species Homo sapiens, is comprehended in the ecosystem problems of the biologists, but the behavioural sciences need to take into account the unique role of cultural-symbolic phenomena in the evolution of social fields, which distinguishes man from plant and animal populations. Social ecology encompasses the organisation of populations and their modes of adaptation to the environment, but has to appreciate the special significance of man's capacity for symbolic intercommunication and the distinctive ways in which such communications may be amplified, attenuated, or distorted, through a multitude of psychological and social mechanisms.

In any ecologically connected system, increases in interdependence have the consequence that the activity of a discrete part, or perturbations in a remote sector, are likely

to affect the functioning of the whole system. For social systems, industrialisation is inevitably accompanied by differentiation of its structure into more and more specialised parts, so that the completion of any major task is likely to require the involvement and the co-ordination of greater numbers of relatively independent sub-systems, and interconnectedness across extended social fields and is now being most rapidly increased by the elaboration of service and maintenance functions, which become equally indispensable to the operation of households and giant corporations.

Specialisation in other institutionalised domains has been no less profound. In science, government and administration, professional roles, occupations and organisational units have been multiplied. In response to the failure of laissez-faire economics to assist those who are disadvantaged in the marketplace, and to the need for massive investment programmes in such areas as defence, education, housing, urban rehabilitation and rural reconstruction, government has extended its influence and control into wider and more diverse areas, and in doing so has greatly increased the 'organic' interconnectedness of industrial societies.

Differentiation into a larger number of parts does not, of itself, guarantee the amplification of communications networks and the absorption of new parts into a wider set of interrelations. This has been (notoriously) the experience of such multi-centred institutions as metropolitan administrations and civil services.<sup>6</sup> Industrialisation has increased the

requirements for intercommunication between specialised parts, but has also produced the means for expanding communication capacities. While science and technology, in general, have become prime movers of an accelerating rate of change, it is specifically in the technologies of transport and communications that the greatest impact has been made on the interrelatedness of system parts. The point has been well made by Emery:

Telegraph, telephone, radio, radar, television, gramophone, typewriter, linotype, camera, duplicator, Xerox, calculator, Hollerith, computer: these names register a century of change that continues in an explosive fashion. Parallel with these have been a very great increase in speed and ease of travel, so that recorded communications flow in greater bulk at greater speed, and even the recording of communications becomes short-circuited as it becomes easier for managers, scientists and politicians, etc. to fly together than to correspond.  
(Emery: 1967:224)

Improvements in man's capacity for moving himself and for transmitting information have the character of both a precondition and a symptom of higher levels of interdependency. They have made possible the emergence of national and multinational associations in which the member groups can react to one another in 'real time'; increasing functional specialisation and geographical diversification of production, distribution and administrative systems have created pressures for innovations and further refinements to improve the speed and reliability of communications.

As I indicated in discussing the concept of social field, the parts of such fields may be related retrospectively (developing from common initial conditions), contemporaneously (actually in

interaction), and prospectively (having overlapping futures). The higher development of the human brain and central nervous system, and man's ability to communicate symbolically, impart to social fields a temporal dimension, as well as a spatial dimension, which is characterised by a greater or lesser connectivity of time-slices.

The scope and amplificatory power of communication channels have some interesting and unexpected consequences in the adoption and imitation, in remote sectors, of events and experiences occurring at some particular point. Fads and fashions can skip continents as a result of timely exposure in a prominent part of the mass media. There is some evidence for example, that the public self-immolation of a Buddhist monk in Saigon, and the equally dramatic suicide of a Czech student, Jan Tilach, during the Russian occupation of Prague, became, via the media, the 'starting condition' for imitative behaviours across the globe. The spate of aircraft hijackings is another instance, and there is now considerable agreement that campus riots in London, New York, Tokyo, Paris and many other university centres towards the end of the sixties, had a common 'ignition' in the events at Berkeley in 1963. The mass media promote contagion, and make it more probable that similar but isolated occurrences in remote parts of the world can be traced back to a single, localised event.

The 'contemporary' interrelations through which the needs and ambitions of individuals and social systems are met are, perhaps, the more widely recognised and best understood.

Specialisation implies that no one part can accomplish a complex task by itself, so that interactive relations with other parts are essential as a means for the attainment of such ends. The momentary interrelations which make an existing division of responsibilities work are the most accessible to observation and intervention, and, typically, high proportions of institutional energy and resources are expended in improving their efficiency and in correcting their relatively apparent deficiencies.

The most challenging interdependencies that are characteristic of social fields are those we have called prospective, and which tend to be more latent than manifest in the existing state of affairs. For example, the economy of all societal resources is such that the outcomes sought by its multitude of actors invariably compete with one another. This can often be anticipated and taken into account in the definition of roles and areas of responsibility, the formulation of laws and regulations and efforts to secure agreement over basic aims and values.

The ubiquity and rapidity of change make it more and more important to try to appreciate in advance, the mutual interferences of separate courses of action. The unevenness of change and greater degrees of interdependence across the social field make it increasingly difficult to do so. It can, of course, happen that activities directed to a particular end have benign consequences in another sphere which were not expected. The introduction of the motor car led to dramatic reductions in the incidence of diphtheria and other diseases that scarred

urban living during the 19th century. The replacement of the horse as a source of motive power reduced the available breeding ground for the flies that carried many such diseases. On the other hand, the building of in-city freeways to relieve traffic congestion has had the opposite and deleterious effect of increasing congestion. Enhanced ecological interdependencies increase the probability that the consequences of present actions will prove to be related in quite unexpected ways.

Durkheim's Division of Labour in Society, which was first published in 1893, significantly predates a number of the concepts and insights I have been discussing. His thesis is that while all societies are characterised by some form of 'solidarity' (broadly, social cohesion), the progress of the division of labour is accompanied by a shift from mechanical to organic forms, from cohesion based on similarities to cohesion based on interdependence of differences. The division of labour itself is advanced by increases in both 'social volume' (the sheer size of a society) and 'moral density' (the degree to which 'individuals are sufficiently in contact to be able to act and react upon one another').

Three causes of increases in moral density are outlined; firstly, the 'progressive condensation' of social life is a natural concomitant of the progress of civilization - the transition from nomadic and hunting societies to agricultural, and, finally, to industrial societies, results in an increasing concentration of the population; secondly, the formation and development of cities, resulting from the need of individuals

‘to put themselves in very intimate contact with others’, creates ‘so many points where the social mass is contracted more strongly than elsewhere’; and finally, ‘there are the number and rapidity of ways of communication and transportation. By suppressing or diminishing the gaps separating social segments, they increase the density of society’ (Durkheim: 1963:259-60). The density of society and the division of labour react upon one another: ‘If society, in concentrating, determines the development of the division of labour, the latter, in its turn, increases the concentration of society’ (Durkheim: 1963:260). The progress of societal differentiation is normally accompanied by new ‘organic’ forms of social cohesion as the relationships among the specialised parts become routinised and embodied in contracts and other laws, customs and norms.

Of further interest to my concern is his analysis of a pathological form of the process - the ‘anomic division of labour’. After drawing attention to certain phenomena manifesting a lack of social cohesion - industrial and commercial crises, labour-management conflicts, and the specialisation of science - Durkheim argues as follows:

If the division of labour does not produce solidarity in all these cases, it is because the relations of the organs are not regulated, because they are in a state of anomie.... The state of anomy is impossible wherever solitary organs are sufficiently in contact of sufficiently prolonged. In effect, being contiguous, they are quickly warned, in each circumstance, of the need which they have of one another, and, consequently, they have a lively and continuous sentiment of their mutual dependence.... But, on the contrary, if some opaque environment is interposed, then only stimuli of a certain intensity can be communicated from one organ to another.

Relations, being rare (or, we might add, entirely novel) are not repeated enough to be determined: each time there ensues new groping. The lines of passage taken by the streams of movement cannot deepen because the streams themselves are too intermittent...the case will be the same if the contiguity, though sufficient, is too recent or has not endured long enough.  
(Durkheim: 1963:368-9)

Regarding the particular case of labour-management conflicts, he offers the following explanation:

Machines replace men; manufacturing replaces hand-work. The worker is regimented, separated from his family throughout the day. He always lives apart from his employer, etc. These new conditions of industrial life naturally demand a new organisation, but as these changes have been accomplished with extreme rapidity, the interests in conflict have not yet had the time to be equilibrated.  
(Durkheim: 1963:370)

In these two passages I find support for the conclusion that the degree of connectivity among the parts of the social field is threatened by the appearance of novelty (...contiguity is too recent...) and by the rapidity of change.

As the part processes of the organism are regulated by the biochemical exchanges of homeostasis, and organic ecologies are regulated by processes of phylogenetic adaptation, so cultural systems play an essential part in the regulation of social ecologies. To the extent that the cultural system integrates the basic values, beliefs, norms, expectations, it provides a constant referent, or set of ground rules, for the regulation of newly formed interdependencies. When change comes too rapidly, and is spread unevenly across the social field, the cultural system itself tends to become disintegrated, and new

interrelationships can no longer be referred to its basic axioms, but have to be worked out independently.

#### 4. Increasing size and complexity

The extensiveness of the social field, the area within which individuals and associations perceive themselves to share some common conditions of life, and within which their behaviours form part of the relevant environment for the others, is most strongly influenced by personal mobility (geographical and social) and the power of communications. In making possible higher degrees of interdependence within the field, these factors also have the effect of extending its boundaries. Satellite television, telex links, faster and larger jet aircraft; these and other refinements of communications are currently 'shrinking the globe', in the same way that the railway era had the effect of shrinking countries. Greater fluidity of stratification systems and more opportunities for travel permit individuals to experience and share in a far wider sphere of life experiences than is possible in less mobile societies.

The popularity of McLuhan's term 'global village' is no doubt due in part to the accuracy of his perception. Commenting in an article on Boulding's recognition of a 'second great transition', Wooton writes:

Post-civilised society is a global society, and, just as civilised man had to adjust to one type of environment, post-civilised man will have to adjust to a new type of environment. It is important to understand the global dimensions of this post-civilized environment since we cannot adequately formulate policies concerning the process of

development unless we first of all have a correct understanding of the historical period in which we live.  
(Wooton: 1971:5)

One of the portents of this new supranational environment is the rise in importance of a new form of enterprise:

The multinational corporation is perhaps the best example of an institution operating within the constraints of the present while at the same time developing the institutional framework for the emerging global society.  
(Wooton: 1971:6)

Perlmutter has coined the term 'global industrial estate' to draw attention to the pervasiveness of modern industrial technology and the transnational economies of scale that it makes possible, while Steiner and Cannon, in their study of 'multi-national corporate planning' note that

rapidly accelerating foreign activities of business enterprises is an impressive development of the past ten years, and continued growth of international business is readily predictable for the future.  
(Steiner and Cannon: 1966:vii)

As a corollary, the Marxian dream of workers of the world united moves closer to some sort of fulfilment, as international labour organisations seek ways in which to combat the new degrees of manoeuvrability in negotiation, and flexibility in production, that are acquired by the international corporations.

Other economic and military developments contribute to the same tendency. The development of intercontinental ballistic missiles has reduced the whole world to a single theatre of war, whereas a few fields at the most were used at Agincourt. The complexities of the international currency system are well beyond the comprehension of the average world citizen but there

are occasions, such as the devaluation of sterling some years ago and the contemporary crisis of the American dollar, in which the extensiveness and apparent precariousness of international monetary relations is made evident, testifying again to the extent of our global interdependencies.

Within national boundaries, similar trends towards the expansion of the field relevant to particular activities can be identified. The farmer must recognise the city as a more and more important part of his world, as agriculture becomes 'industrialised' and its success more directly dependent upon the city's mass markets, finance, and export facilities. The indications are that those sectors of the rural economy which fail, for whatever reason, to move into the ambit of metropolitan influences, becomes 'dissociated' segments within the wider system, requiring active intervention merely for them to survive.

National and regional planning and development activities have been given an increasing amount of attention, and they typically have the effect of forging new links between previously segregated (or only loosely connected) areas. River basin development schemes, for instance, of which the work of the Tennessee Valley Authority is a classic example, often have the side-effect of uniting the occupants of the basin within a larger system. Co-ordinated regional development and management of employment, education, transport and the like, again widens the system of interdependencies and extends the horizons of the field for its participants. In general, the extensiveness of

these interdependencies is most clearly revealed during labour strikes affecting key distribution, maintenance, or communication systems.

For the individual and the family, no less than for the business enterprise, the relevant social world has become larger, more complex and more variegated. As progressively fewer of the needs of individuals are directly provided for by the home and the family, so their dependence upon other outside agents increases (Braverman: 1974). The expansion of urban areas and of the proportions of the population living in them, advances 'cosmopolitanism' at the expense of 'localism'. As television is defined as a necessity rather than a luxury, it assumes a major role in extending people's vision into other worlds, and becomes a dominant source of shared experiences.

The overall complexity of the social world increases for all its participants, as they become increasingly interdependent. Their inter-relations become less and less predictable under the impact of the field's rapid, but uneven, transformation.

#### Symptoms of Turbulence

These four dimensions of the transformation of industrial society are, of course, abstractions from the concrete situation, of which they are different facets, rather than separate components. In reality, they overlap and support one another in their effects on social worlds. As I have tried to suggest, the transformation has an impact upon all social units

within the field - individual, family, community, formal organisations, the state itself; environments characterised by accelerating, but uneven, rates of change, by ever-increasing size and complexity, and higher degrees of interdependence among the constituent parts, make very different demands upon individual group and organisational adaptive capabilities than do the more easily regulated environments of both pre-industrial and industrial society.

Emery and Trist have described environments of this sort as turbulent, in contrast to other simpler types of environment which are 'placid' or 'reactive'. While in these less complex and less dynamic environments, significant sources of variance for the actor originate only from other behaving systems, turbulence implies that the field itself has become dynamic, and that important sources of variance for the individual or the organisation can emerge from practically any point in the field. Thus, organisations caught up in these transformation processes are likely to be subject to a radical increase in their area of 'relevant uncertainty':

The consequences which flow from their actions lead off in ways that become increasingly unpredictable; they do not necessarily fall off with distance, but may at any point be amplified beyond all expectations; similarly, lines of action that are strongly pursued may find themselves attenuated by emergent field forces.

(Emery and Trist: 1965:26)

The critical consequence from the point of view of purposive human activities in general is that the degree of uncertainty and unpredictability associated with all future-oriented

activity increases. The relevant environment of the actor becomes so complex and so dynamic that the ramifications of any of his possible behaviours cannot be adequately anticipated beforehand. The acceleration and the unevenness of change mean that the future cannot be safely extrapolated from the past, and these forces, together with the increasing overall size and complexity of the set of interconnections relevant to the attainment of a particular outcome, render 'comprehensiveness' in the analysis of choice situations, and in decision-making, impossible (Cooper: 1976).

Trist writes:

turbulence grossly increases the area of relevant uncertainty for individuals and organisations alike. It raises far-reaching problems concerning the limits of human adaptation. Forms of adaptation, both personal and organisational, developed to meet a simpler type of environment no longer suffice to meet the higher levels of complexity now coming into existence.  
(Trist: 1970:5)

Transition from industrial to post-industrial society has proceeded furthest in urban North America, but there are signs of stress within the industrialised societies of Europe that are indicative of a similar transition. Unless we can learn to control and guide the transformation process, it seems likely that the social field for purposive human behaviours in these societies will be thrown into a state of turbulence.

The turbulent social field becomes prone to the fragmentation of the social fabric, and the breakdown of co-ordination and regulation among the subsystems. It experiences widespread lags

and breakdowns in the formation of the cultural and other symbolic apparatus which stabilise interpretations of new realities into theories and concepts, values and understandings, by means of which men can adjust to change. It is characterised by increasing vulnerability of the ecology of man-nature relations, and by increasing susceptibility to outbursts of violence and conflict between groups experiencing different rates and kinds of change. It is a domain in which the increasing size, transience, novelty and unpredictability of his primary social world is more and more likely to result in the individual becoming alienated.

This, at least, is the pessimistic scenario - a projection of the impact of turbulence which assumes that our abilities to understand and to act appropriately within such highly complex and dynamic environments will not have been subject to radical improvements; that our institutional arrangements for decision-making, policy-making and planning will not have caught up with our technological prowess.

In this study I aim to develop a framework for analysis using a holistic approach and to contribute to research currently being undertaken towards finding a solution to the problem of how man and his institutions can best adapt to the conditions of a turbulent environment.

Let us look at some of the symptoms of the drift into post-industrialism that have already been identified.

## 1. Future shock

The predominant feature of the four dimensions of turbulence that I have described - the one about which there is most agreement in the literature, and the one with the most vigorous effects upon all of the others, is the acceleration of change, innovation and diffusion, dominated itself by the rapid growth of science and technology during the last 200 years.

Commentators on the phenomenon, with their prognostications, gloomy and utopian, are abundant.<sup>7</sup> Toffler is one of the most dramatic. His study explores:

....the roaring current of change, a current so powerful today that it overturns institutions, shifts our values and shrivels our roots. Change is the process by which the future invades our lives, and it is important to look at it closely, not merely from the grand perspectives of history, but also from the vantage point of the living, breathing individuals who experience it. The acceleration of change in our time is, itself, an elemental force. This accelerative thrust has personal and psychological, as well as sociological consequences....unless man quickly learns to control the rate of change in his personal affairs as well as in society at large, we are doomed to a massive adaptational breakdown.

(Toffler: 1970:4)

Human life is characterised as a constant flow of 'situations', and situations can be broken down into six components:

.....while the boundary lines between situations may be indistinct, every situation has a certain 'wholeness' about it, a certain integration. Every situation also has certain identifiable components. These include 'things' a physical setting of natural and man-made objects. Every situation occurs in a 'place' - a location or arena within which the action occurs. Every situation also has, by definition, a cast of characters - people. Situations also involve a location in the organisational

network of society and a context of ideas or information... situations also involve a separate dimension which, because it cuts across all the others, is frequently overlooked. This is duration - the span of time over which the situation occurs.  
(Toffler: 1970:32)

It is instructive to note the similarities between this concept of the situation and the more systematically defined concept of behaviour setting formulated by Barker and Wright in their development of a naturalistic psychology (1955: see also Barker: 1968).

A behaviour setting is a standing behaviour pattern together with the context of this behaviour, including the part of the milieu to which the behaviour is attached....  
(Barker and Wright: 1955:9)

They have used this concept to order the naturally occurring behaviours observed in an English and an American town, and to try to understand individual psychological acts in terms of the physical and social settings in which they occur.

Toffler's thesis is that the acceleration of change has the result that the stream of situations we experience in our everyday lives, become increasingly characterised by transience (high rates of 'turnover', temporariness, impermanence), novelty, (the non-routine, unpredicted, surprising), and diversity (situations of 'overchoice'), and it is the inability to adapt to these phenomena which gives rise to 'future shock'. Relationships with the six components of human situations may be equally affected by transience, novelty and diversity: man-thing relations, man-place relations, social relations, man's relations with the social organisation - the 'organisational nexus' the context of ideas and information, and man's relations

with time, each may become more impermanent, more unpredictable, and more variable:

It is precisely these relationships that, as acceleration occurs in society, become foreshortened, telescoped in time. Relationships that once endured for long spans of time now have shorter life expectancies. It is this abbreviation, this compression, that gives rise to the almost tangible feeling that we live; rootless and uncertain, among shifting dunes. (Barker & Wright: 1955:43)

Elsewhere he writes:

We may define future shock as the distress, both physical and psychological, that arises from an overload of the human organism's physical adaptive systems and its decision-making processes. Put more simply, future shock is the human response to overstimulation... Caught in the turbulent flow of change, called upon to make significant, rapid-fire life decisions, (the victim of future shock) feels not simply intellectual bewilderment, but disorientation at the level of personal values. (Barker & Wright: 1955:290,322: emphasis added)<sup>8</sup>

The new form of society latent in these developments, Toffler refers to as 'super-industrial society'. This he intends to connote: "...a complex, fast-paced society dependent upon extremely advanced technology and a post-materialist value system" (Toffler: 1970:434). What happens when the changes confront an unprepared population at too great a pace is revealed in America's experience:

...the United States is a nation in which tens of thousands of young people flee reality by opting for drug-induced lassitude; a nation in which millions of their parents retreat into video-induced stupor or alcoholic haze; a nation in which legions of elderly folk vegetate and die in loneliness; in which the flight from family and occupational responsibility has become an exodus; in which masses tame their raging anxieties with Miltown or Librium, or

Quinal, or a score of other tranquilisers and psychic pacifiers. Such a nation, whether it knows it or not is suffering from future shock.  
(Toffler: 1970:325)

Other authors have been particularly concerned with the strain placed upon cultural adaptations by the pace of scientific and technological advance. The greater the rate and the dimensions of innovation, the greater the problems of refashioning concepts and value systems to cope with the changes. Thus, Ozbekhan makes the following judgement:

The prime reason for the failure of the rules and values on which our rationality rests can, as I and many others believe, be found in the massive changes and the rapid rates of change that more Western societies are undergoing. The phenomena generated by change are not only stressful, they are not only disquieting - but they put to question the validity of many general concepts that, for a long time, have provided muscle to our world view. It is admittedly difficult to maintain a world view predicated on a particular definition of facts when we are no longer sure what a fact is, or, on scarcity when we, in the industrially advanced West, are experiencing the birth pains of abundance; or, on the sanctity of toil when the possibility of a leisure society has already raised questions of social organisation so fundamental as to be frightening, and so alien to our traditional modes of thinking as to be unanswerable...  
(Ozbekhan: 1968:50)

Health services are one particular area in which western societies are currently facing a set of severe moral and ethical problems, as a result of the revolutionary progress being made in the biological sciences. Results already achieved in spare-part surgery, contraception and genetic control pose an immense challenge to widely held belief systems and values.

There are signs that within science itself, the rapidity with which new disciplines, concepts and methods are being developed is forcing changes on the traditional structure of subject-matter that will encourage synthesis as well as specialisation. Nevertheless, the problems of methodological esoterica and scientific jargon are still a huge handicap in the crossing of disciplinary boundaries.

The characteristic of turbulent society that I am talking about is known and experienced by millions of people as the 'rat race'. Further evidence of the existence of the phenomenon is that it begets its negation - in groups of people known as drop-outs and hippies, in institutions such as "free" universities, and in social relationships of contrived spontaneity - 'encounter groups', 'T-groups', and sensitivity training.

## 2. Fragmentation

The 'accelerative thrust' of science and technology results in greater transience, novelty and diversity in the life situations of individuals, and creates pressures towards the constant readjustment of concepts, beliefs, attitudes and values, as reality is revolutionised. The history of even the first part of this century shows that changes occur in both the material means of existence and in value systems. The argument as to which is the cause of the other is no longer a very fruitful one and it is widely accepted that the phenomena are mutually interactive in their effects. There is some evidence however, that at different historical times, either ideations or

production systems may be subject to the more rapid or more fundamental changes, and thus became the leading part of the system.

The bias in interpretations of the industrialisation of western society is very much towards giving technology and the organisation of production the role of prime mover. Thus, Jantsch comments:

The decisive factor in the current development...is the rapid and almost independent growth of the 'technology engineering' area per se, and its one-sided influence on the other engineering areas, primarily on the slowly developing area of social engineering, which is frequently disregarded in planning. Technology engineering is affecting the insufficiently known area of human engineering in an unknown, but certainly important way. The uncontrolled growth of this one element in our overall system, technology, is now about to assume the characteristics of cancerous growth, disturbing and repressing the healthy development of the other parts of the system.

(Jantsch: 1969:179)

The second facet of turbulent society that I wish to look at is fragmentation, or 'fracture' (Thom: 1975). Fragmentation results from the unevenness of change among different groups within society, and the tendency for other groups to put themselves outside society. Not all parts of a complex and dynamic system such as society are likely to be subject to changes at the same rates and in the same directions.

Fracturing, in contrast to the division of labour (functional specialisation), implies a reduction of cohesion and lower degrees of articulation among the segments that become separated. With fast and uneven rates of change, some segments

are likely to get left behind, others are likely to be thrust out ahead, and it seems, others are likely to opt out altogether.

In relation to material advance it is the urban and the rural poor that get left behind, these groups often being co-extensive with ethnic or religious minorities. Referring to a segment of the society being left behind in this respect implies that the disadvantaged are not merely a statistical aggregate of unfortunate individuals, but that they share other characteristics which relate their situation to the social structure, rather than simply to their personality configurations. Thus for the urban poor, the high costs of housing (often accentuated rather than alleviated by 'urban renewal' - slum redevelopment into middle-class accommodation), the size of families, barriers to education, and unemployment, help to account for a cycle of poverty in which the attainment of 'escape velocity' is beyond the means of the majority. Middle-class administered welfare schemes alleviate the symptoms - there has been a constant upward revision of the poverty level but it is found difficult to produce any preventive policy. The aged, too, are likely to become neglected by virtue of their structural position in changing world. With the steady contraction of kinship into nuclear families, 'the pensioners' become a structurally defined group, and one which, for want of political power, is likely to be left behind in the advance towards mass affluence.

Other groups advance materially much faster than the mean, and give rise to pockets of opulence, equally fractured from the total structure. The break is clearest with those persons who become sufficiently affluent for further income to be irrelevant as far as the satisfaction of their material needs is concerned. Many top entertainers, sportsmen and executives fall into this category. One suspects that the clannishness of professional golfers and the top car-race drivers derives not only from their shared experiences on the circuit, but also from the common life-styles made possible by their success. Other groups may still depend upon a continuing income, but have incomes high enough to support life styles which divide them from the mass of people. The 'nouveaux riches', the 'jet set', the 'stock-broker belt' - these terms designate groups which are as insulated from average life experiences as the 'hillbillies', the 'Okies' and the urban poor.

In the cultural-valuational dimension, other segmentations occur. Here the van is represented by creative artists, 'media men', youth sub-cultures, and the like; groups that are closely related to the information-communication system, or for whom most significance lies in the future rather than the past. Other groups do not change their values and beliefs as fast as the world around them is changing, and, indeed, are inclined to maintain that there is a special virtue in the maintenance of the traditional and the orthodox, at a time when nothing else seems very permanent at all. Institutions which embody and purvey patriotism, religious orthodoxy and privilege, tend to react defensively when attacked, with the effect of solidifying

their existing positions, and widening the gulf between themselves and the van (Stanworth & Giddens: 1974).

Intuitively, one suspects that the burning of national flags and draft cards and the baring of private parts, have become such popular sports largely because of the certainty with which they evoke sentiments of moral outrage from the morally orthodox groups.

Fracturing of the social structure is likely to be a significant feature of turbulent society to the extent that rates of change in the value systems and in material welfare are significantly different for different parts of the society. Conversely, we expect to find in relatively placid and homogeneous societies (not subject to constant change), that splintering and segmentation of the social structure is much less likely to occur.

A different order of fracturing occurs (we may think of it as active rather than passive) when a group wilfully disengages itself from the rest of society, either to create its own world, or to undermine and destroy the existing social structure. Contemporary examples suggest that this is more likely to be a response to the rapidity and direction of change, than to its unevenness, although it could be expected that groups which are neglected beyond a certain tolerance level (groups that are left so far behind perhaps, as to make their situation quite hopeless), will be inclined to break altogether with the system. It may be that the proponents of Black Power and the followers of Martin Luther King differed in their perceptions of how far

the blacks in America had been left behind. It is interesting to note that a number of the 'seceding' groups have adopted designations which emphasise their removal from the main-stream. Drop out, underground press, and free university are, in part, relational concepts, drawing attention to the realms from which they are disengaged.

### 3. Ecological Traps

The third facet of turbulent society has been described by Vickers as 'the end of free fall', and it will be useful to quote from him at some length:

Within six generations or so, we in Britain - and others elsewhere even more quickly - have blown ourselves out of the agricultural into the industrial epoch, out of a rural into an urban way of life, and out of a natural into a man-made environment....The explosion released several critical rates of change. Populations began to multiply faster; individuals began to produce and consume more, to travel and communicate more, to expect and demand more. As a result they began to depend more on each other and, soon, to get more and more in each others ways; but these consequences were noticed only later, because the explosion began in a world so under-occupied and under-developed that for a time each change could excite itself and the others without breeding limitations. This is what I call the time of free fall. It grows clearer every day that the time of free fall is coming to an end. For the man-made environment in which the industrial epoch is closing us - created as it now is by the unintended results of what everyone does - is becoming too unpredictable to live in and may soon become too unacceptable to live with... We shall have to live in a much denser political medium. We must take account of the increasing mutual demands and expectations of people and societies who are growing more numerous, more crowded, more mutually dependent - but also, at present, more diverse and more mutually intolerant. (Vickers: 1968:52)

Modes of behaviour that were felt to be appropriate during the time of 'free fall' are exemplified in the widespread practice in earlier days of what has been called 'exploitative' lumbering. Ogburn has described how the plentiful forests of the Appalachian, Great Lakes and Gulf regions of the United States were indiscriminantly cut and burnt, for timber and for agricultural land.

Then rather suddenly, it began to be realised in certain centres of thought that if the policy of cutting timber continued in the same rate and in the same manner the forests would in a short time be gone and very soon indeed they would be inadequate to supply the needs of the population.  
(Ogburn: 1950:250)

It is now generally understood that the overcropping of natural resources of plant or animal life can lead to disastrous and irreversible ecological consequences; this understanding came about with the development of a biological concept of ecology. The current concern with the problems of pollution and conservation and better management of the environment in general expresses a new level of ecological awareness, one in which man himself, and the man-made environment, become intrinsic elements of an extended ecosystem. The re-appearance of concepts of social and human ecology reveal a sensitivity to a wider system of interdependencies.

Free fall must come to an end when the recognition is forced upon us that to continue to allow the activities of individuals and organisations to be guided by self-interest will lead us into 'traps' as consequential for our urban civilisation as the dust bowls of the Prairies, and the thickening pollution of the Great Lakes have been for plant and animal kingdoms.

The trap in its basic nature is the same in every case. Whether we focus attention on the individual or on any larger human association up to the whole population of the planet, we find that its relations with its environment are changing and that these changes threaten it in three main ways. Sometimes they threaten the physical basis of its existence, such as food supply, living space, or even breathable air. Often they threaten the institutional basis for its existence, by posing tasks which its institutions, political, economic or social, cannot be adapted to. Always they threaten what I will call the appreciative basis for its existence (the word 'cultural' would be too narrow) by requiring it to revise and revalue, more radically than time permits, its understanding of the world it lives in and of whatever in that world it lives for. (Vickers: 1970:29)

This third facet of turbulent society, results particularly from the increased overall connectedness among human activities and the environment that they act upon, which increases the ecological density and makes it less and less possible for actors to adapt to the environment by themselves; joint strategies are demanded for successful adaptation. Trist has argued that one of the key consequences of post-industrialism is that welfare and development of the system as a whole become interdependent, a situation which contrasts with simpler levels of environmental complexity. 'Welfare' (well-being; continuing to function well; maintenance of the steady state) and 'development' (progression; continuing to advance; attainment of higher order steady states) refer to the static and the dynamic aspects of the socio-cultural system's adaptation. The relatively placid environments of pre-industrial societies are characterised by 'auto-regulative' welfare processes, embodied in extended kinship systems, while development processes require an active intervention, and are called into being when, for some

reason, the maintenance of welfare through kinship breaks down. Development is a function of welfare. In the more complex and dynamic environments of industrial societies, development is maintained by auto-regulative processes which are embodied in the market system, and reflected in the replacement of kinship groups by enterprises as the leading part. Under industrial conditions, welfare increasingly requires active intervention, as kinship systems are no longer able to cope. Welfare is a function of development.

In the turbulent environments which correspond to post-industrial society, welfare and development become interdependent functions. "The meta-problems created in this situation pass the limit within which auto-regulative processes can adaptively operate with respect to either welfare or development, so that an active role becomes generally required." (Emery and Trist: 1972:130). In particular, accelerating rates of change means that development becomes a pre-requisite for the welfare of sub-systems - otherwise they are left behind and rendered obsolescent, falling into states of 'ill-fare'. In addition, the increasing interdependence among sub-systems means that the ill-fare of relatively few sub-systems, especially if they occupy strategic positions, can be critical for the larger system. The increased interdependence of the fates of sub-systems, expressed in terms of their development and their welfare, leads to the point at which 'adaptation now depends on the ecological regulation of the interdependencies in all their dimensions of the innumerable sub-systems which characterise

large societies undergoing rapid but uneven change" (Emery & Trist: 1972:129). Kinship systems and enterprises are supplanted by ecological systems as the critical unit for adaptation.

To the extent that the well-being and progress of all the sub-systems become more and more strongly inter-related, the demands for regulation, co-ordination, and institutionalisation of relationships can be expected to increase also, but so far we have had relatively little success in this respect. Even where the problem can be fairly simply identified, responsibilities and authorities tend to be divided and confused. Responses to the increasingly ecological character of the man-technology-nature nexus lag behind the realities of increased environmental uncertainty and give rise to the familiar pathologies of administrative tardiness, organisational conflicts, retreat into routinisation and abdication of responsibilities.

Thus, for example, there is a sense in which pollution unites us all. The well-being and adaptivity of all parts of industrialized societies are subject to the reversibility of the rates at which some of our crucial resources are used or fouled. The ecological problems of pollution, waste disposal and resource management urgently demand a new coming to terms between industry and society, between the corporation and the city, between private gain and public good, in which the parties will engage in a joint search for a solution and jointly take responsibility for adhering to it. Already, we are witnessing

some new forms of relationship between the political and productive systems in the metering of pollutants, imposition of penalties for excessive emissions, the application of subsidies and other fiscal preferences for 'cleanness' or process or recycling, and the relocation of large users of fuel.

To the turbulent society's problems of coping with future shock, fracturing and friction can be added the difficulties of steering around the dangers of becoming 'ecologically trapped'. If the connectedness of outcomes is recognised too late, or not at all; if the mutual independence of welfare and development is not appreciated by decision-makers, then we can anticipate the setting off of some disastrous ecological processes for society as a whole, which, if they are reversible, will require huge applications of will and resource to reverse them.

#### 4. Alienation

Alienation may be related in particular to the overwhelming size and complexity of the social field which industrial man has to confront, but it also seems to be related to the rapidity of change and the lags in our institutional and value systems for which this is responsible. Friedmann, for example, makes this connection quite explicitly:

We seem to be faced with rising disorders because of our collective inability to bring environmental 'turbulence' under control. Societal actions lead to unpredicted, negative consequences on such a scale that they tend to deny the effectiveness of individual effort. One result of this is that more and more people become alienated from the society.

(Friedmann: 1969:316)

For a social system undergoing a transition of the kind we have been discussing, it is not only the sheer extensiveness and seeming immutability of the social realities that people have to meet in their lives that creates pressures towards the attenuation of their links with the social field, but also the increased instability and unpredictability of the field itself.

Faunce makes the following cogent evaluation:

The most persistent indictment of industrial society is that it has resulted in the alienation of industrial man. Loneliness in the midst of urban agglomeration; loss of social anchorage in mass society; the absence of a predictable life trajectory in an era of unprecedented social change; and the powerlessness of man within the complex social economic and political systems he has created are common themes in the social criticism of the industrial way of life...

The pervasiveness of alienation in industrial societies results from its relationship to characteristics inherent in the social structure of these societies... Rapid social change, increased structural differentiation, decreased structural integration, and rationalisation of social organisation have produced widespread feelings of powerlessness, normlessness, or meaninglessness; this pattern of social experience reduces the correspondence between the criteria used in maintaining self-esteem and those used in assigning social status, which results in loneliness, apathy, or overconformity.

(Faunce: 1968:84:102)

Unlike the other symptoms of turbulence that I have discussed, alienation is specifically an individual (or more correctly, a socio-psychological) phenomenon, having to do with the web of affiliations that, link the psychological individual to the social field. Alienation refers to the attenuation of the causal strands that connect the psyche to the social field, whereby the wholeness of man's experiences and activity becomes

fragmented. This formulation encompasses the distinction that is usually made between alienation from the social units with which the individual is connected, and alienation from the self, or self-estrangement.

This is so, because the self from which the individual becomes alienated is a social phenomenon; it is the 'looking-glass self', which is presented to us in interaction with significant others - an assimilation of others' perceptions of ourselves. The building up and maintenance of a reasonable, stable and consonant self-concept is, therefore, largely a function of the individual's meaningful involvement in systems of social action that endures sufficiently long for the individual to be able to 'locate' himself, and achieve a degree of commitment and identification with respect to the social behaviours in which he is implicated.

The generation of commitment and identification of this sort is threatened by the gathering momentum of industrial society. The weakening of kinship bonds, increments in personal mobility, greater specialisation of occupations and so on, tend to reduce the possibilities for stabilising a positive personal identity. Again, Faunce writes:

Difficulty in affirming a positive image of self is pervasive in industrial societies. Industrial man frequently participates in activities in which he has invested little of his self and in which he is consequently self-estranged in the classic sense of this term as developed by Marx and Fromm. Freed from the bonds of small-group pre-industrial society, the individual is confronted with the problem of maintaining self-esteem in an unstable, fragmented, and poorly integrated social order.

(Faunce: 1968:132)

When the stream of situations in which industrial man becomes involved grow more ephemeral and transient, less uniform and less predictable, it is harder for him to cement his image or self into his social context. He becomes self-estranged. The pervasiveness of such self-estrangement in advanced industrial society may help to account for the appeal of the concept of 'self-actualisation' that has been popularised by Argyris, particularly in the context of organisational behaviour, for self-actualisation represents the antithesis of self-estrangement - the maturing of the self rather than its vapourisation (see Argyris: 1957 and 1973).<sup>9</sup>

Estrangement from the social group can take the form of powerlessness, meaninglessness, or isolation (See Seeman: 1959, and Blauner: 1964 for discussion of the concept of alienation). The pervasiveness of the sense of powerlessness of the individual and his inability to influence, let alone control, some of the important conditions of his existence, appears to be a universal concomitant of industrialisation. The debate concerning the implications of the bureaucratisation of society for the maintenance of democratic control revolves around the question of the extent to which bureaucracy deprives the individual of his power to exert an influence over important decisions affecting his own and other's lives. Isolation refers to the more general separation of the individual from the social field that I have discussed earlier in talking of the field 'going out of existence' for him. Loneliness is, perhaps, the most common consequence of isolation (Slater: 1975).

Of meaninglessness, Faunce has this to say:

Various writers have noted the increasing difficulty in rapidly changing segmented societies in finding appropriate standards for judgement regarding courses of action or patterns of belief. Meaninglessness refers, more specifically, to the difficulty in making accurate predictions about the behaviour of others or about the outcome of our own actions. Situations have meaning to us to the extent that we are able to anticipate their outcome. Industrialism has increased the incidence of social situations that are meaningless in this sense.  
(Faunce: 1968:89)

Meaninglessness, in particular, is a consequence of the modes of production fostered by industrialism, whereby jobs and occupations have become ever more specialised, to the point at which the individual becomes incapable of understanding the relation of his own part-function to the completed product, and disinclined to take any pride in or responsibility for that product. The job itself becomes meaningless when it allows no possibility for the worker to grow as a person and express himself in some creative way.

In what does the alienation of labour consist? First, that the work is external to the worker, that it is not a part of his nature, that consequently he does not fulfil himself in his work but denies himself, has a feeling of misery, not of well being, does not develop freely a physical and mental energy, but is physically exhausted and mentally debased. The worker therefore feels himself at home only during his leisure, whereas at work he feels himself homeless. His work is not voluntary but imposed, forced labour. It is not the satisfaction of a need, but only a means for satisfying other needs.

(Bottomore and Rubel: 1963:177-8)

Marx's statement from the middle of last century has a surprising aura of modernity.

Self-estrangement, powerlessness, isolation, and meaninglessness are the social psychological correlates of the drift into post-industrialism.

## NOTES TO CHAPTER I

- 1 Brzezinski (1968), Boulding (1964), Toffler (1970), Bell (1967). See Kumar (1979) for criticism of post industrialism.
- 2 See Shonfield (1969) for an analysis of, and speculation about, the changing roles and relations of the corporation and the state in modern society.
- 3 The United Nations and the OECD definitions of a 'developing country' are given in Moyes and Hayter (1964). They list a total of 153 societies of which approximately 34 are 'industrialized' according to OECD criteria.
- 4 Some imbalances of this sort, between government, technology, and social problems, are discussed by Sayre Smith (1969) in terms of the relative degrees of political and technological 'readiness' for particular societal innovations.
- 5 See, in particular, Emery and Trist (1972) Barker (1968,1969), and the earlier work of Hawley (1950).
- 6 John Lindsay documents some gross examples of maladministration and agency inco-ordination in describing recounting his first term as Mayor of New York, (Lindsay: 1969).
- 7 A different view can be found in Horowitz (1969), who questions the thesis that innovation is accelerating, and argues that significant discoveries are in fact decreasing.
- 8 For some evidence concerning the relation between the occurrence of significant life changes and the onset of psychiatric illness, see Rahe, McKean and Arthur (1967) and Brown and Birley (1968).
- 9 Blackler and Brown have recently criticised the concept of self-actualisation as being exploitative of the environment in which people live (Blackler and Brown: 1978).

**CHAPTER II**

**SYSTEMS THEORY**

SYSTEMS THEORY AS A FRAMEWORK

This account of the transformation of social fields related to the advent of post-industrialism, and of the kinds of problems that this transformation is likely to create for the government (in the widest sense of control or management) of social systems, has been largely descriptive and partly speculative. In order to be able to respond effectively in the midst of massive upheaval and dislocation of the social world, we need, both as management scientists and as centres of action within the social field, a system of concepts and understandings that is sensitive to the problems of organised, dynamic complexity, and that has sufficient theoretical significance to act as a guide in the selection of behaviours that are most likely to serve particularised ends and interests without threatening the survival of the fields as a whole.

Notwithstanding the generally descriptive character of my preceding discussion, it has been guided by a particular conceptual framework, that of systems theory. This conceptual framework I will now make explicit and amplify, primarily through an exploration of three concepts that are central to a theory of behavioural systems: purposiveness (or purposeful behaviour); the causal texture of the environment; and adaptation. In the present chapter I sketch an outline of systems theory and its development, and discusses the concept of a purposeful system. The two succeeding chapters present concepts of the environment and of adaptation.

It is now over 30 years since von Bertalanffy gave general currency to the concept of system, and presented the fundamental distinction between open and closed systems that has become basic to the systems approach to behavioural phenomena (Bertalanffy: 1950). There is available in the literature a considerable collection of articles, anthologies and monographs which surveys the field of systems theory and I do not propose to duplicate these efforts.<sup>1</sup>

Some introductory remarks are needed however, in view of the fact that the systems concept has tended to become, over the last decade or so, all things to all men. It has become fashionable to use a systems vocabulary, with the consequence that a wide diversity of points of view and methodology can become obscured beneath a veneer of terminological similarity.

Most conceptions of the systems approach, however, appreciate that its distinctive competence rests in its capability for handling problems of organisation in a holistic manner - of interpreting dynamic complexes of interacting parts as wholes, and understanding them on this level.<sup>2</sup> Systems theory is, therefore, of particular relevance to the investigation of biological, psychological and social phenomena, as most of the critical problems of these areas are problems of organisation. They are problems to do with the ways in which an entity can endure and maintain its essential form over time, while its parts are in complex and dynamic interaction, and constantly being regenerated. These 'organisational' problems require the simultaneous appreciation of structure and process, for in

living systems these two dimensions are inseparable. (Cooper, 1976). In outlining the quest for a general system theory, Bertalanffy writes:

If we survey the evolution of modern science, as compared to science in a few decades, we are impressed by the fact that similar general viewpoints and conceptions have appeared in very diverse fields. Problems of organisation, of wholeness, of dynamic interaction, are urgent in modern physics, chemistry, physical chemistry and technology. In biology, problems of an organismic sort are everywhere encountered: it is necessary not only to study isolated parts and processes, but the essential problems are the organising relations that result from dynamic interaction and make the behaviour of parts different when studied in isolation or within the whole. The same trend is manifest in gestalt theory and other movements as opposed to classical psychology, as well as in modern conceptions of the social sciences.  
(Bertalanffy: 1956:1)

Systems theory is a reaction to the mechanistic and atomistic thought-modes of the natural sciences that dominated science for most of the 19th century. Systems theory may be thought of as a scientific revolution, in Kuhn's terms, that became unavoidable as it was realised that mechanism failed to offer the life sciences a concept of life that would distinguish scientifically between living and non-living systems and a concept of behaviour that would distinguish between the behaviour of men and the behaviour of machines. The breaks appeared on a number of fronts and soon began reinforcing one another.

In psychology, the atomistic approach was first challenged by the gestaltists, Wertheimer, Koffka and Kohler, who came to take as their standpoint the evidence in perception of experienced

wholes, and who replaced behaviourism with a phenomenological methodology. In biology, the strain on such ad hoc hypotheses as the existence of 'entelechies' and 'elans vitau' reached breaking point in the early decades of this century, and the mechanism - vitalism dispute was defused by the development of an organismic approach in the work of, for example, Woodger, Jennings, Hendersen and Cannon. In social psychology, the concept of the group mind, which had dominated attempts to understand the interdependence of the group and the individual, was similarly exposed as a vitalistic idea and succumbed to the more rational approaches of Lewin, Brown and Mead.

The character of this revolution has been further elucidated by Ashby:

Science has, of course, long been interested in the living organism; but for 200 years it has tried primarily to find, within the organism, whatever is simple ...

The same strategy - of looking for the simple part - has been used incessantly in physics and chemistry. Their triumphs have been chiefly those of identifying the units out of which the complex structures are made. The triumph has been in analysis, not in synthesis. Thus today the biochemist knows more about the amino acids of which egg-protein is composed than he does about the white of egg from which they have been obtained. And the physiologist knows more about the individual nerve cell in the brain than he does about the action of the great mass of them in interaction.

Thus until recently the strategy of the sciences has been largely that of analysis. The units have been found, their properties studied, and then, somewhat as an after-thought, some attempt has been made to study them in combined action. But this study of synthesis has often made little progress and does not usually occupy a prominent place in scientific knowledge...

...whereas physics and chemistry, given a system, promptly breaks it to pieces in order to study the parts, there is arising a new discipline that studies the system without breaking it to pieces.

The internal interactions are left intact, and the system is, in the well-known words, studied as a whole.

(Ashby: 1958:1)

The distinction between open and closed systems was of very great importance in the application of systems concepts to the understanding of behavioural systems (Bertalanffy: 1950). An open system engages in exchanges with its environment, importing from the environment certain sorts of material, transforming this in characteristic ways and exporting a new configuration of the materials back into the environment. Processes such as photosynthesis, respiration, and manufacturing may thus be regarded as conversion processes of open systems. The ability to incorporate free energy from the environment means that open systems are capable of adaptive evolution, moving towards higher degrees of complexity and organisation and that they can maintain themselves in a time-independent steady state, avoiding increases in entropy. Closed systems, on the other hand, are subject to the second law of thermodynamics and they tend always to be moving towards an equilibrium point at which no more work can be done. Being unable to import energy from the environment, they are not capable of differentiation and growth; once the initial state of the system is determined, all subsequent states of the system can, in principle, also be known. According to Bertalanffy:

Every living organism is essentially an open system. It maintains itself in a continuous inflow and outflow, building up and breaking down of components, never being, so long as it is alive, in a state of

chemical and thermodynamic equilibrium but maintained in a so-called steady state which is distinct from the latter. This is the very essence of that fundamental phenomenon of life which is called metabolism, the chemical process within living cells.  
(Bertalanffy: 1950:3)

This distinction was, in itself, of the greatest significance to the understanding of organisms and behavioural systems, and of the ways in which they differ essentially from inanimate objects and machines. The assimilation of the concept of open systems into the behavioural sciences has had as one consequence far more systematic attention to the environment of individual and social action, and the part that it plays in behaviour. As Emery and Trist have commented:

... though von Bertalanffy's formulation enables exchange processes between the organism, or organisations, and elements in its environment to be dealt with in a new perspective, it does not deal at all with these processes in the environment itself which are among the determining conditions of the exchanges.  
(Emery and Trist: 1965:22)

A concept of the environment as a causal texture that 'co-produces' the outcomes of the purposive behaviours of individuals and groups I will discuss in the following chapter.

A further source of insight and inspiration in the development of a theory of behavioural systems was the dramatic progress made in systems engineering during and after the Second World War. The funds available for research on weapons and defence systems, and the bringing together of the first operations research teams to work on problems of integrated men-machine complexes that the new weapons technology created, compounded interest and progress in understanding the system problems of

control and communication in complex organisations. The development and refinement of radar-controlled gunnery, of target-seeking missiles such as the torpedo, and of servo-mechanisms for controlling the courses of ships and aircraft had a valuable spin-off for the social sciences by providing insights for the comprehension of goal-directed and purposeful behaviour of social systems.<sup>3</sup>

In particular developments in information and communication theory and cybernetics gave rise to a powerful cross-fertilisation, with developments in the understanding of purposive human behaviour, that can be traced back to Sinter (1924) and Tolman (1932). It now appears that the development of the ability to build a machine that could regulate its own behaviour by means of feedback signals, led to an over-enthusiastic extension of cybernetics principles to problems of social life that still continues. An important corrective drawing attention to the limitations of the applicability of cybernetics to purposive behaviour, was published by Churchman and Ackoff (1950) and the subsequent collaboration of Ackoff and Emery (1972) has gone an important step beyond this in identifying the properties of purposeful systems and showing in what ways they differ from goal-seeking systems.

This much, at least, can in general be said about the background and temperament of systems thinking. In order to appreciate some of the variation that is possible within this general frame, I turn to Pepper's analysis of 'world hypotheses' (Pepper: 1942).

Pepper identifies four 'relatively adequate' world hypotheses: formism, mechanism, contextualism and organicism. The means he uses in isolating these four is the 'root metaphor theory', which, he says: "is simply a recognition of the fact that there are schools of philosophy, and an attempt to get at the roots of these schools." (Pepper: 1942:328).

The four world hypotheses amount to competing interpretations of the universe, each of which has its own conception of what the basic units are and its own mode of interpreting them. They are "hypotheses of unrestricted scope, which exclude no evidence as irrelevant on the grounds of being outside the field under discussion." (Pepper: 1942:326). Insofar as they each claim to encompass all phenomena in the universe (and none of them has the power to conclusively adjudicate over the adequacy of the others), it is open for different thinkers to adopt the hypothesis that they think or feel to be most appropriate to the problems they have to confront. If Pepper's claim is correct (that each of these four is a relatively adequate world hypothesis), then in particular instances an investigator's choice of a particular strategem may, without serious damage, be guided as much by his personal characteristics as by any objective criterion demonstrating its advantages over others. There is some evidence that systems thinkers, while each adhering to the basic conception of the system (a set of objects and the relations between them) have connected the basic systems vocabulary to a number of different world hypotheses.

The four hypotheses are outlined by Pepper as follows:

Formism is often called 'realism' or 'platonistic idealism'. It is associated with Plato, Aristotle, and scholastics, neoscholastics, neorealists, modern Cambridge realists. Mechanism is often called 'naturalism' or 'materialism' and by some, 'realism'. It is associated with Democritus, Lucretius, Galileo, Descartes, Hobbes, Locke, Berkeley, Hume, Reichenbach. Contextualism is commonly called 'pragmatism'. It is associated with Peirce, James, Bergson, Dewey, Mead. There may be a trace of it in the Greek, Protagoras. Organicism is commonly called 'absolute (or objective) idealism'. It is associated with Schelling, Green, Bradley, Bosanquet, Royce. (Pepper: 1942:141-2)

The root metaphor of formism is similarity, the experience of identity and sameness in the world around us; of mechanism, it is the machine, such as a watch or a dynamo; contextualism's root metaphor is the historic event or act; that of organicism is the organism and integration. It has to be appreciated, of course, that world hypotheses are not always made explicit, even by philosophers, and that eclecticism is, perhaps, more common than the consistent exploration of a single hypothesis.

The hypotheses are arranged in four different pair relationships. Formism and mechanism are analytic, and contextualism and organicism are synthetic. "Not that the analytical theories do not recognise and interpret syntheses, and the synthetic theories analysis; but the basic facts or data of the analytical theories are mainly in the nature of elements or factors, so that synthesis becomes a derivative and not a basic fact, while the basic facts or data of the synthetic theories are complexes or contexts, so that analysis becomes derivative." (Pepper: 1942:142).

In the second polarity, formism and contextualism are linked as dispersive theories, mechanism and organicism as integrative.

For the dispersive theories, the universe is a rather chaotic scattering of facts, lacking any overriding determination or order.

Facts are, therefore, taken one at a time as they arise, understood in the contexts in which they occur and left. For the integrative theories, on the other hand, the cosmos is highly systematic and facts occur in a determinative order, so that if enough could be known they could be described, and perhaps, predicted, down to the minutest detail. The dispersive theories are more extensive in scope than the integrative theories, but are lacking in precision. More information about its 'facts' increases the determinateness of a dispersive theory by spreading its structural corroboration into a wider context (Structural corroboration is contrasted with multiplicative corroboration; the former consists in 'the convergence of qualitatively different items of evidence in support of a single item', e.g., 'circumstantial evidence'; multiplicative corroboration is achieved in the repetition of an 'identical' item of evidence in many different instances.) The integrative theories on the other hand, straining to put all facts in a determinative order, are more precise, but suffer from inadequacy of scope. They are most likely to be threatened by the appearance of new information than are the dispersive theories. Putting the two pairs together reveals that analysis is treated dispersively by formism and integratively by mechanism, while synthesis is treated integratively by organicism and dispersively by contextualism.

## Contextualism

In this present work I respond (for reasons which become clearer in Chapter 3) to the contextualist root metaphor; the historic event, or act:

...But it is not an act conceived of as alone or cut off that we mean; it is an act in and with its setting, an act in its context.

(Pepper: 1942:232)

The contextualist's world is a world of incidents, events and acts that can be described least ambiguously by the use of verbs alone - running, loving, exploring, working, suffering and so on. Its fundamental categories are change and novelty - an explicit denial of inherent orderliness in the universe.

...disorder is a categorical feature of contextualism, and so radically so that it must not even exclude order... Change in this radical sense is denied by all other world theories. If such radical change is not a feature of the world, if there are unchangeable structures in nature like the forms of formism and the space-time structure of mechanism, then contextualism is false.

(Pepper: 1942:234)

The degree of uniformity and structure that nevertheless persists is apprehended in the concepts of quality and texture, whose sub-categories provide the framework for the interpretation of actual events and acts. The quality of an event is constituted of its spread (its 'so-called specious present'), its change and its degree of fusion; and texture can be decomposed into its strands, its contexts and its references. The quality of a melody for example, is in its experiential wholeness or gestalt - 'its total meaning'; its texture refers to the notes and the tonic relations of which it is constructed.

In general, "... the quality of a given event is its intuited wholeness or total character; the texture is the details and the relation which make up that character or quality." (Pepper: 1942:238)

For the contextualist, the investigation of a context or complex is not usually undertaken for its own sake, but is end-oriented, or pragmatic. Correspondingly, it appeals to an operational theory of truth - "truth in terms of action, of actual events having references which lead to satisfactions in other actual events." (ibid: 268).

	ANALYTICAL		SYNTHETIC	
	.....		.....	
	:	:	:	:
INTEGRATIVE	: Mechanism	:	: Organicism	:
	.....	:	.....	:
	:	:	:	:
DISPERSIVE	: Formism	:	: Contextualism	:
	.....	:	.....	:

(adapted from Pepper, 1942: p.146)

ANALYTIC:	Basic facts are elements or factors
SYNTHETIC:	Basic facts are contexts or complexes
INTEGRATIVE:	Facts occur in a determinative order, and if enough is known they are, in principle, predictable. Characterised by inadequacy of scope.
DISPERSIVE:	Facts taken one by one and interpreted as they come. The cosmos is unsystematic. Characterised by inadequacy of precision.

For the contextualist moreover, analysis is never finished, but spreads out into ever more inclusive context, so that the point at which investigation begins and ends is, finally, a rather arbitrary manner. For systems theory, the complete acceptance

of the idea that phenomena in the world may be ordered to an hierarchical array of systems and sub-systems (each system included in a larger system of which it is a part and itself being constituted of parts which are systems in themselves), means precisely that interpretation can proceed outwards into ever more inclusive contexts and inwards into an ever finer texture.

This cursory account of Pepper's ideas is, unfortunately, no more than an introduction and an appreciation of the world hypotheses of formism, mechanism and organicism in particular will require an examination of the original work. The contextualist hypothesis, to which the systems thinking of this study is oriented, is to be further outlined in the investigation of the development in psychology of a contextualistic concept of the environment and its role in behaviour. Pepper himself has shown the way in which the categories of contextualism may be fruitful in the study of behaviour, in his critical review of Tolman's study of "Purposive behaviour in animals and men" (Pepper: 1934).

#### Other Approaches to Systems Thinking

With regard to other varieties of systems thinking, it is apparent that the machine metaphor of mechanism has a dominant place in the interpretive schemes of many who identify themselves with systems engineering, systems management and systems analysis. Whenever the workings of complex men-machine systems are investigated from a methodological viewpoint, that

takes no account of the unique properties of a man, but is interested in him as a physical force, or calculator, or communicator, the investigation may usually be traced back to the categories of mechanism. The mechanistic root metaphor may well be the most appropriate for analysing inanimate systems in the natural world, but its application to the social world invariably strains the interpretation of purposive human activity. Thus, for example, essays on "The mechanics of bureaucracy" (Reiger: 1966), and on the "Cybernetics analysis of change in complex social organisations" (Cadwallader: 1959) and the theory of 'systemic planning', laboriously constructed by Catanese and Steiss (1970), spell out some parallels between mechanical and social systems, but fail to enrich our understanding of man and his socio-cultural world. Many attempts to apply systems analysis to management problems suffer from similar shortcomings (Optner: 1968, Blackler and Brown: 1978).

#### Functionalism and Systems Theory

The confusion that has sometimes arisen between systems theory and structural functionalism (or simply functionalism) in management is clarified if it is appreciated that functionalism is a kind of systems theory, that has been rather heavily dependent upon the organicist hypothesis. The equilibrium model is functionalism, developed in the work of Malinowski and Radcliffe-Brown; it reflects a synthetic bias, because its datum is a set of interrelated parts, and an integrative disposition, in its insistence on the harmony or balance of these parts.

Thus, a great deal that is understood as systems thinking in sociology relates back to the organicist root metaphor, including, of course, the more specific organicism of Spencer, Ward and others. As Pepper's analysis suggests, the strains that have been experienced in the consistent application of organic models of society have to do mainly with the inadequacy of their scope and particularly their capacity to incorporate notions of conflict, change and novelty. There has thus been a tendency toward incorporating elements of other world hypotheses, and, in particular contextualism, that will help to overcome such limitations. The incorporation of concepts of dysfunction (Merton: 1949) and of reciprocity and autonomy in functional theory (Gouldner: 1959), may have rendered it more flexible, but Nagel's excellent critique (1956) has not yet been satisfactorily answered, and Dahrendorf's more polemical evaluation of structural-functionalism (1958) has won many minds.

#### Formism

Finally, the influence of formism is also to be found in certain types of systems thinking. In Pepper's view, formism is the weakest of the four hypotheses and its full expression within a particular theoretical framework is, therefore, not to be expected. Its strength lies in the feeling of certainty that adheres to its root metaphor, the intuition of similarity, and its expression in particular disciplines is typically made manifest in class-theoretic concepts and ideas. Our feeling is that the programme of general systems theory that was launched

by Bertalanffy and Rappaport in 1956 can be related to this formistic hypothesis.

Bertalanffy commented at that time that in view of the correspondences emerging in a number of previously unrelated parts of science:

It seems legitimate to ask for a theory, not of systems of a more or less special kind, but of universal principles applying to systems in general. In this way we come to postulate a new discipline, called General System Theory. Its subject matter is the formulation and derivation of those principles which are valid for 'systems' in general.

A first consequence of the existence of general system properties is the appearance of structural similarities or isomorphies in different fields. There are correspondences in the principles which govern the behaviour of entities that are intrinsically, widely different...

In fact, similar concepts, models and laws have often appeared in widely different fields...

It seems, therefore, that a general theory of systems would be a useful tool providing, on the one hand, models that can be used in and transferred to, different fields, and safeguarding, on the other hand, from vague analogies which often have marred the progress in these fields.  
(Bertalanffy: 1956:1-2)

Boulding, at the same time, advocated an approach to the organisation of general systems theory that would proceed by arranging the empirical fields in a hierarchy of complexity of organisation and try to develop a level of abstraction appropriate to each. He identified eight such levels: frameworks, clockworks, thermostat, cell, plant, animal, human, and social (Boulding: 1956). Although this classificatory

scheme of systems (and others like it) have been taken up in the systems literature, they have not shown great promise of stimulating new developments, but are limited in their utility to a clarificatory role.<sup>4</sup>

### Systems Theory and the Concept of Purpose

The development of a non-mechanistic systems theory that is able to take account of such unique properties of humans and their behaviour as will and personality has, for a long while, been baulked by the problem of differentiating objectively between goal-seeking behaviour (of which machines as well as men are capable) and purposeful behaviour, which represents the distinctive capability of human and social systems; of demonstrating the uniqueness of human behaviour as well as its similarities with cybernetic machines. The work by Ackoff and Emery, 'On purposeful systems' (1972) puts forward a solution to these difficult problems and it is the basis of this discussion of the concept of purpose.<sup>5</sup> They adopt the following definition of the system:

A set of inter-related parts each of which is related directly or indirectly to every other element and no subset of which is unrelated to any other subset.

(Ackoff and Emery: 1972:18)

Given the interdependence and interpenetration between systems which are 'open', and their environments, it follows that an adequate understanding of living systems (all of which are open) requires an appreciation not only of the internal characteristics of the system, but also of the characteristics of the environment in which it exists, and of the nature of the

two-way exchange between system and environment. Following Emery and Trist (1965), if we use (L) to indicate some potentially lawful relation, and the suffixes (1) to refer to the system and (2) to the environment, we can say that a comprehensive understanding of such systems requires some knowledge of each member of the following set:

$$L_{11}; \quad L_{12}; \quad L_{21}; \quad L_{22}$$

$L_{11}$  refers to internal system processes,  $L_{12}$  and  $L_{21}$  to system-environment interdependancies and transactions, and  $L_{22}$  to the processes by which parts of the environment become interrelated - 'the area of interdependencies that belong within the environment itself.' Ackoff and Emery have defined the environment of a system as:

a set of elements and their relevant properties, which elements are not part of the system but a change in any of which can cause or produce a change in the state of the system,  
(Ackoff & Emery: 1972:19)

Whereas, as I have pointed out, the contextualist's framework implies that the environment of an open system may logically be extended outwards to include the entire universe, the above definition restricts it pragmatically to those parts of the environment which make a difference to the state of the system.

The relationship of producer-product which occurs in this definition is distinguished from the relationship of cause-effect, in the following way. An object (A) in a particular environment is said to be the producer of another

object (B) at a later time, if A is a necessary but insufficient condition for the occurrence of (B). In other words, there are other necessary and insufficient conditions which must occur in conjunction with (A) in order for (B) to be produced. The relationship between an acorn and an oak tree exemplifies the producer-product relation; the acorn is certainly necessary for the occurrence of an oak, but is not by itself sufficient; other conditions, soil and climate, for example, also being necessary.

The relationship of cause and effect, on the other hand, occurs when a set of circumstances at a particular point of time is both a necessary and a sufficient condition for the occurrence of another set of circumstances:

Producer-product is thus a special case of cause-effect. It applies when we consider the relationship between parts of time-slices (a time-slice is a 'bounded volume of space at a moment of time... that part of the natural world in which an investigator is interested') rather than time-slices as a whole.

(Ackoff & Emery: 1972:22)

Thus, when the time-slice that is the object of investigation is constituted of a system and its environment (and this is the way of looking at behavioural phenomena that is characteristic of the systems approach), then we can expect to find that a number of the 'products' (or 'outcomes') that we are interested in understanding are jointly produced by the system and its environment, there being at least one element or relationship in each that is necessary, but insufficient, for the outcome or product in question.

The term 'co-producer' is used to refer to "two or more objects, properties, and/or environments which are producers of the same product", with the observation added that "since no producer is ever sufficient for its product, every producer has at least one co-producer." (Ackoff & Emery: 1972:23). I shall show later that the relationship of producer-product is basic to the concept of adaptation; the adaptability of a behaving system is a function of its availability to select and use certain parts of its environment as co-producers of its outcomes.

### Open Systems

It is clear that the class of open systems includes a very wide range of phenomena. Plants, meters, servo-mechanisms, target-seeking missiles, organisms, individuals, groups, organisations - all of these are open systems. It is clear also that there are some important differences in the characteristics and capabilities of these different systems. Open systems may be differentiated along two dimensions: the range of actions of which they are capable and the range of outcomes that they can produce.

A thermostat attached to the heating system of a house, for example, is capable of only three actions - doing nothing, turning the furnace off and turning the furnace on; and as long as it is in action, it is capable of producing only one outcome - the maintenance of the air temperature within a given range. A human being, by comparison, is capable of an infinite variety of different actions and of producing an equally wide range of

different outcomes. The critical differences lie in whether or not the system is capable of choosing the actions that it will take and the outcomes that it will produce.

Three classes of system can be distinguished. Firstly, there is a group of functional systems, which are not capable of choice at all, but which merely act and react in certain prestructured ways. Both their actions and their outcomes are predetermined, by their internal properties and by the environment. The second group, of goal-seeking systems, are those which are capable of choosing their actions, but whose outcomes are determined by the environment. Finally, there is a class of purposeful systems - those which are capable of choice with regard both to their actions and to the outcomes that they produce. The fourth possible class - of systems that are capable of choosing their outcomes, but whose actions are determined - is meaningless. Systems whose actions in a particular state of the environment are determined clearly cannot exercise choice over the outcomes produced by those actions.

	outcomes predetermined	choice of outcomes
actions predetermined	: functional : systems	: - :
choice of actions	: goal-seeking : systems	: purposeful : systems

Typology of Systems - Ackoff and Emery

Functional system: In any one state of its environment, a functional system has only one action (set of actions) and can produce only one outcome (set of outcomes). Thus, the changes registered by barometers and thermometers, for example, invariably correspond to states of the environment by which they

are determined. Other functional systems are more complex and are able to display structurally different actions in structurally different environments, though never structurally different actions in the same environment. Servo-mechanisms and state-maintaining systems are generally of this type - they react differently to different states of the environment, but always so as to produce a predetermined set of outcomes - to perform the same function. A third class of functional systems is capable, in addition, of performing different functions in some different environments - an air-conditioning system that maintains a desired temperature and humidity is an example. There is, finally, a rather marginal group of functional systems - those which have only one action for all states of the environment, but which, as a result of changes in the state of the environment, can produce some different outcomes. Ackoff and Emery give the example of waste emitters, such as a factory chimney, which, under certain environmental conditions (but not others), produces pollution of the lower atmosphere.

functions of outcomes

	.....		.....
	: one function in	: one function in	:
	: all environments	: any one environ-	:
	:	ment-different	:
	:	: functions in some	:
	:	: different environ-	:
	:	: ments	:
	.....	.....	.....
	: one structure	:	:
	: in all	: PASSIVE	: PASSIVE
struc-	: environments	: FUNCTIONAL	: FUNCTIONAL
ture	.....	.....	.....
of	: one structure	:	:
actions:	: in any one	:	:
	: environment -	: REACTIVE	: REACTIVE
	: different	: FUNCTIONAL	: MULTI-FUNCTIONAL
	: structures in	:	:
	: some different:	:	:
	: environments	:	:
	.....	.....	.....

Goal-seeking systems: The basic distinction between functional and goal-seeking systems is that goal-seeking systems are able to select structurally different actions for doing the same thing in one environment. They are systems:

that can respond in structurally different ways to one or more structurally different (internal or external) events and all their responses have the function of producing a particular outcome, which is its goal... a goal-seeking individual or system is responsive, not reactive, because it has a choice of responses... Such an individual or system may accomplish the same thing in different ways.

(Ackoff & Emery: 1972:30)

A chess-playing computer, a radar-controlled gun and an electronic maze-solving rat are examples of goal-seeking systems. It must be noted that when such systems have memory, then they are capable of learning and improving their efficiency in goal-attainment over time. There is a class of multi-goal-seeking systems, which seek different goals in different environments, but which still do not determine the goal to be pursued. Most plants have the properties of multi-goal-seeking systems. Goal-seeking systems choose the means by which to pursue their goals, but the goals to be pursued are determined by the environment and not by the system itself. The computer and the rat have to be programmed by an agent from the environment.

Purposeful system: The basic distinguishing characteristic in this case is that purposeful systems can choose their goals, as well as the means by which they attempt to attain them. A purposeful system is "one which can produce (1) the same functional type of outcome in different ways in the same

structural environment, and (2) can produce functionally different outcomes in the same and different structural environments... Thus a purposeful system is one that can change its goals under constant environmental conditions; it selects goals as well as the means by which to pursue them. It thus displays will. Human beings are the most familiar examples of such systems." (Ackoff & Emery: 1972:31).

Hence, purposeful systems are, in an important way, environmentally independent - neither their courses of action nor the purposes that they pursue are determined by the properties of the environment that they are in. If for example, a mature human being was substituted for the thermostat of my earlier example and given control over the supply of warm air to a building, his possible range of actions and the range of outcomes that he could potentially produce would be far greater than that of the thermostat (a reactive functional system), and would be quite independent of any environmental state. If it were too hot, he could make the building hotter; if it were too cold, he could make it colder. If he became bored, he might simply quit performing his function. To be purposive is more than simply to react or to respond.

Animals and men have memories, and their ability to engage in choice of actions and outcomes under constant and varying environmental conditions means that they are capable of learning - specifically they can improve their knowledge of the relative efficiency of differing courses of action and they can alter the relative values of the outcomes that they can produce. In other

words, through experience they can find better ways of doing things and they can change the ranking of the goals that they seek. Given the additional capacity of communication, they can also systematically improve their knowledge of the courses of action that are available to them in particular environmental contexts. Such improvements can be made without communication, but they would then be dependent upon trial-and-error behaviour. The effectiveness of inter-species communication is naturally a decisive factor in determining the amount and effectiveness of learning that can take place.

It is evident that the capacities of purposive systems are not only much greater than, but also that they include, the capacities which are characteristic of functional and goal-seeking systems. This is so simply because the choices upon the purposive systems include the choice to deliberately suppress their freedom in selecting actions and outcomes - at least, this is true of humans. There are, in addition, abundant instances in which the potential complexity of human behaviour is downgraded to purely functional or goal-seeking activity, though they may more often be due to coercion than to voluntary choice. Part of the legacy of the industrial revolution - the "rationalisation" of production - has been the deliberate downgrading of the tasks to be performed by human beings, so that as Marx observed, they become "mere adjuncts of a machine".

#### Systems as Instruments

This is but one example of a widespread phenomenon - the use by certain systems of other systems as instruments for the

production of certain outcomes. An instrument is defined as 'an object which co-produces the outcome of an individual or system's action, which co-production is itself produced by the individual or system' (Ackoff & Emery: 1972:31). Hammers and spanners, washing machines and refrigerators, calculating machines and computers are some examples of devices that are used by individuals as instruments. It can be said, in general, that the class of functional systems and the different types included within that class, have significance almost exclusively as instruments that have been created by men to extend their inherent capacities. They do not occur naturally in the processes of biological evolution, but are artifacts.

An important general observation with regard to the use of instruments is that any device that is used as an instrument by an individual or system is always at a lower system level than that of the system or individual that uses it. It is this fact, perhaps, that allows us to stay calm in the face of the prophecy that computers or robots are going to take over the world. Conversely, when one individual or group wants to use another individual or group as an instrument, this can only be achieved through restricting the choices of the 'used' individual and curtailing his purposive behaviours. The actual builders of the Pyramids were the instruments of the pharaohs and they could be used as such only as long as their behaviours were those of function or goal-seeking systems.

### Collectivities

It should be made clear that these concepts referring to different levels of systems are quite consistent with the concept of social collectivities as systems. Although the basic analogue for the purposeful system is the psychological individual, groups, organisations, communities, even societies, may be treated in terms of the same distinctions. Insofar as the members of any social collectivity can be said to jointly produce a particular outcome or outcomes (and the group as a whole can be said to act in certain ways that enable its behaviour to be distinguished from that of other groups, and from its own behaviours at different times), then the group can be said to have an individuality and can, for some purposes, be treated as a unified entity - a system. Thus, for example, winning and losing are outcomes for a football team which are, to an extent, determined by each member's participation, and, as is well known to fans, different teams adopt very different styles of play.

A 'social individual' is defined by Ackoff and Emery as 'any collection of psychological individuals that is itself treated as an individual' (Ackoff & Emery: 1972:212). Thus, social scientists have differentiated among social collectivities, according to such properties and characteristics as their size, rates of growth and membership turnover, their degree of cohesion and type of leadership, their propensity to fragment or to endure, and so on. Families are characterised by their socio-economic status and the 'emotional climate' of the home,

communities by their relative stability or instability and by the amount of social pathology within them, organisations by changes in their efficiency, their degree of centralisation, and their style of leadership. The uniqueness of social collectivities can be expressed in terms of their culture, which corresponds to the personality of the psychological individual. (Ackoff & Emery: 1972:229).

These systems concepts of behaviour may be linked to the concept of the social field if we now think of the field as a connected network of open social systems, the relevant environments of which are, to a degree, overlapping, so that each system's environment includes some of the other systems in it. We can, for convenience, dichotomise the field into system and environment, corresponding to the gestaltist's more abstract distinction between 'figure' and 'ground', in which case the component systems are such entities as individuals, groups, communities, and organisations. Some further definitions from Ackoff and Emery may help to clarify this conceptual link:

Social system: a system whose elements are purposeful individuals.

Social group: a purposeful system whose members are purposeful individuals and who are intentionally co-producers of a common objective.

Organisation: a social group with a functional division of labour relative to its common objective(s).

Community: A social group which provides its members with, or provides them with access to, instruments for the satisfaction of some of their analogous objectives,

instruments which some of its members are responsible either for producing and maintaining or for providing the group with the means for acquiring and maintaining them, and which all its members are responsible for using in a way which does not reduce the access of any others in the group to them.

Definitions 13.4, 13.2, 13.9 and 13.5,  
Ackoff and Emery.

Conceptualising social groups as systems does, however, raise some problems concerning the relations between such systems and the parts of which they are constituted, between the behaviour of the system regarded as an individual and the behaviour of its members, taking them as individuals. It would seem that the individual members may either be used by the group for the attainment of the group's ends, or they may use the group as an instrument for the attainment of their individual ends.

Although in practice there may be some tension towards the balancing of rewards and contributions - the needs of the individual that are satisfied and the amount of his individuality that has to be surrendered - there is a meaningful polarity in the possible relations between the individual and the group. Ackoff has formalised this polarity in the following way:

Furthermore there are two types of organisation... one type, the homogeneous organisation, consists of members whose relevant function is to serve their organisation's objective. A business corporation is such an organisation. The other type the heterogeneous organisation, consists of members whose objectives it is the function of the organisation to serve. A community is such an organisation.  
(Ackoff: 1970b:24)

The significance of this in planning for different types of system is to be discussed later on.

I have shown then, that the concept of purposiveness refers to a characteristic of an open system that is defined in terms of the relationship between the system and its environment. A system is purposive in a particular environment if it can choose its goals and the means for achieving them. In what follows I will be mainly concerned with the purposive behaviour of individuals, groups, and organisations and with the specific question of how they can adapt successfully as the environments for action become increasingly dynamic and unpredictable.

Before turning my attention to the concept of the causal texture of the environment, I should note that Ackoff and Emery identify a fourth class of systems, which they call ideal-seeking systems. An ideal is an objective that cannot be obtained in any time period, but which can be approached without limit. A perfectly frictionless machine, error-free observations, the greatest happiness of the greatest number, perfect competition; these are examples of ideals. "Only those purposeful systems can be ideal-seeking that can choose between objectives; that are able to maintain progress toward an ideal by choosing another objective when one is achieved or the effort to achieve it has failed, and that consistently sacrifice objectives for the sake of ideals... a purposeful system or individual is ideal-seeking if, on the attainment of any of its objectives, it chooses another objective which more closely approximates its

ideal." (Ackoff: 1970b:241)... I will return to the discussion of ideal-seeking systems in considering ways of adapting successfully to turbulent environments.<sup>5</sup>

## NOTES ON CHAPTER II

- 1 See Buckley (1967,1968), and Churchman (1968a) and Emery (1969) for a way into the systems literature. The foundations, development and applications of general system theory are described in Bertalanffy (1968). Hall and Pegen (1956) is frequently referred to for the definition of system, and the journal General Systems in which their articles appear is a useful general source. The relevance of system theory to organisations is explored in Katz and Kahn (1966), Litterer (1969) and Maurer (1971).
- 2 An early paper by Angyal (1939) proposing a new 'logic of systems' as a counterpart to the conventional 'logic of relations', and distinguishing between understanding and explanation as two corresponding ways of knowing, is still germane to the methodology of systems theory.
- 3 Some of the more stimulating work in this area came from Rosenblueth, Wiener and Bigelow. See Rosenblueth, Wiener and Bigelow (1943), Rosenblueth and Wiener (1950) and Wiener (1948).
- 4 A general discussion of mechanical, organic and process models of social systems, together with a review of general systems theory, can be found in Buckley (1967). For some of the shortcomings of general systems theory see Hempel (1951).
- 5 An earlier discussion of the nature of ideals can be found in Churchman and Ackoff (1949).

## CHAPTER III

### ENVIRONMENT AND SYSTEM BEHAVIOUR

In this chapter, I shall explore the relationship between the way people behave and their environment, in particular the organisation as a behavioural constraint. An open systems approach to action will be contrasted with that of the closed system, which emphasises the importance of environmental considerations for purposive action.

### ENVIRONMENT AND BEHAVIOUR

It is a fundamental fact that the environments of open systems do make a difference to their ability to maintain themselves (to survive) and to the efficiency with which they perform their functions. For example, many machines only operate effectively within a given temperature range, the efficiency of ships, as means of transport, is impaired by gales, and the efficiency of a windmill is directly dependent upon the availability of wind. At the level of purposeful systems, we know that the success of a rat in solving a maze and finding food is a function of the complexity of that maze, and that the attainment of desired educational outcomes depends, to some extent, upon the maintenance of a classroom environment that is conducive to learning. We may not always know which kind of environment is most supportive for the attainment of particular purposes, as is evidenced, for example, by the debate over the desirability of a therapeutic or a punitive milieu for corrective institutions and prisons. Such debates, however, confirm the importance of the environmental dimensions in purposive behaviour.

At the organisational level, economists have made some distinctions among the kinds of environments that are relevant for the operations of business firms. The models of perfect, imperfect, oligopolistic, and monopolistic market situations are a characterisation of limited (though crucial) parts of 'business' environments. Clark (1965) and Rosengren (1964) have discussed the changing environments of the education system and the mental hospital in the United States to help account for goal-redefinition in these systems.<sup>1</sup> At the level of international affairs a good deal has been written about the distinctive way in which the 'cold war' conditioned the relationships between nations, and, on the grand view, diplomacy is the attempt by nations to formulate and maintain a state of affairs in the global environment that is supportive for the purposes of all nations (this objective has the quality of an 'ideal').

It is important to recognise that insofar as machines, as well as men, are producers (i.e. a machine by itself, such as a pump or a motorcar, is a necessary, but not a sufficient condition in a particular environment for raising water or getting from one point to another), we need knowledge of their environments in order to be able to understand their behaviour. The behaviours that I am principally interested in are the purposive behaviours of men and their organised groupings and it is, therefore, the characteristics of psychological and social environments that are to be specifically considered. Subsequent discussion may be made easier by the presentation of an extended example of the kinds of significance that attach to the environments of purposive systems - in this case an organisation.

An infantry platoon in a war zone has the task of capturing a particular enemy position and this objective is to be achieved within a given time period with the minimum possible number of casualties. Assuming that we know all that can be considered relevant about the 'internal' characteristics of the platoon itself (its organisation and its capabilities in terms of firepower, intercommunication and the like), we could not make any worthwhile forecast of the probable effectiveness of the operation, or of the chances of the platoon being wiped out, without a great deal of additional information about the nature of the battlefield - i.e. the characteristics of the platoon's environment. In assessing the viability of such an operation, a commander would want information concerning the distribution and strength of the enemy, the nature of the terrain (the distribution of 'dead ground'; its traversibility) the distribution of support facilities (food, medical aid, ammunition supplies) and atmospheric conditions (the weather, distribution of hours of darkness and daylight).

Except where such properties of the environment are determinable by the purposive behaviour of the platoon (as may be the case, for example, with the distribution of support facilities, when these are at the disposal of a more inclusive system, of which the platoon is a part), they are sui generis, having an independent existence and independent effects vis-a-vis the organisation. They belong to the  $(L_{21})$  and  $(L_{22})$  classes of relationship. In order for the platoon to carry out its task, some coming to terms between it and the environment is clearly necessary. This mediation occurs through observation and

through the platoon acting in, and on, the environment in such a way as to change the state of system-environment relations.

### Perception

The faculty of perception allows the accumulation of information. Unsystemised viewing of the landscape by the rank and file members, together with the more deliberative acts of environmental scanning which constitute reconnaissance, have the effect of incorporating into the organisation some elementary 'mapping' of the relevant threats and supports, obstacles and aids. The environment thus transposed into information and communicated amongst the members, becomes 'intelligence' (an internal characteristic of the platoon) and we can talk about its quality, quantity and distribution and the influence these have on performance and survival.<sup>2</sup> This type of mediation corresponds to ( $L_{21}$ ) relations; perception is dependent upon causal strands originating within the environment. The most significant outcome for purposeful systems of this type of mediation is learning - the process by which the environment becomes known in such a way as to make possible increases in the efficiency of purposive behaviour (Argyris & Schon: 1978).

The other type of mediation I have referred to corresponds to ( $L_{12}$ ) relations. In order to achieve its purpose the platoon will most obviously have to move, thereby changing its position relative to the enemy and all the other environmental relevancies. There are, in addition, a number of ways in which the platoon can act to change its environment in order to make

it an easier environment in which to operate. In battlefield situations, illumination may be manipulated through the imposition of a blackout and through the use of flares and smokescreens; roads and bridges can be constructed and those of the enemy destroyed; the field may be fragmented by the erection of barbed wire or the construction of ditches. Military theorists have employed the terms tactics, strategy and operations to refer to the various configurations of behaviours that are available to a military unit, differentiated principally in terms of the scope and duration of particular sequences of action.

I note here, too, that because the effectiveness of the enemy's activities is known to be a function of his knowledge of the same environment, some amount of energy and resources may be expended in making the environment appear different to what it really is. The use of camouflage, decoys and booby traps, the destruction of existing signs and the erection of false ones - the manipulation of the environment in order to plant misleading cues for the adversary - may be a significant factor in the effectiveness of the mission.

#### Limits on Activity

My general proposition which emerges from this and the earlier examples is that the environments of purposeful systems have a significant determining influence over the kinds of objectives that can be pursued and the means (courses of action) by which they can be pursued. On the face of it, this is a somewhat

naive proposition, for anyone who is conscious of engaging in purposive behaviour, in pursuit either of his own ends or those of an organisation of which he is a member, will become aware of certain ways in which the environment he is acting in limits, channels, or supports the pursuit of certain ends and the adoption of particular courses of action. An individual striving to become a politician, or to represent his country in some field of sport; a rural family battling to stay on the land in the face of a rural recession, or an organisation trying to maximize its share of the market; a welfare department trying to abolish poverty; or a planning authority trying to redevelop a central business district; in all of these cases, the system must, if it is to succeed, come to terms with an environment in which the distribution of rewards and frustrations is complex and often unpredictable; in which the means available change their character and their position over time and in which other systems are often working toward competing ends.

It is surprising, therefore, that until relatively recently, social scientists have devoted very little attention to environments as objects worthy of study in their own right. In 1954 Chein wrote:

Perhaps one of the outstanding weaknesses of contemporary psychological theory is the relative neglect of the environment by many of the most influential theoretical viewpoints. Stimulus-response psychology, for instance, tends to assimilate the entire environment, insofar as it is relevant to behaviour, into the term 'stimulus' and, perhaps, also, as in the case of reinforcement theory, 'goal objects'; for the most part many environmental features tend simply to be taken for granted... If, as I believe, a proper appreciation of the role of environmental factors is important

to rat psychology, it is ever so much more so in a humanistic psychology... Not only are human environments more complex, but the behaviours with which the rat psychologists are most concerned take place in the controlled environments of the laboratory, whereas the behaviours of greatest concern to the humanistic psychologist take place in freely variable (from the point of view of the psychologist) environments. With the greatest complexity of human environments they have perhaps more of a role to play, and with their free variability they have, so to speak, a more active role.  
(Chein: 1954:115)

In a similar vein, Barker more recently writes:

Scientific psychology knows nothing, and can know nothing, about the real-life settings in which people live-in ghettos and suburbs, in large and small schools, in regions of poverty and affluence. One might think that in the course of its necessary concern with stimuli, psychology would have become informed about the human environment. But this is not the case. Psychology has necessarily attended to those elements of the environment that are useful in probing its focal phenomena, namely the behaviour-relevant circuitry within the skins of its subjects, within psychology's black box. Psychology knows much about the physical proportions and dimensions of the environmental probes it uses - of distal objects of perception, for example, and of energy changes at receptor surfaces. But the problem is that, in the course of its investigations, it has excised these environmental elements from the contexts in which they normally occur; mealtimes, offices, airplanes, arithmetic classes, streets and sidewalks. In view of psychology's concern with such dismantled fragments of the environment, it is not surprising that general conceptions of the environment occupy a minor place in the science... the most common notion, which can hardly be called a theory, is that the non-behavioural, ecological environment of man is an unstructured probabilistic, and largely passive area within which man behaves according to the programming he carries about inside him.  
(Barker: 1969:13-2)

The situation is curiously similar in the case of the study of organisations. Evan comments:

Social science research on organisations has been concerned principally with intraorganisational phenomena... with relatively few exceptions, social scientists engaged in organisational research have not taken the organisation in its environment as a unit of observation and analysis... the relative neglect of inter-organisation relations is all the more surprising in view of the fact that all formal organisations are embedded in an environment of other organisations, as well as in a complex of norms, values and collectivities in the society at large.  
(Evan: 1966:175)

In support of this judgement, Dill has written:

Administrative science needs propositions about the ways in which environmental factors constrain the structure of organisations and the behaviour of organisational participants.  
(Dill: 1959:409)

Blau makes the point quite categorically:

The complaint often heard that we know virtually nothing about the impact of the social setting on organisations is quite justified  
(Blau: 1964)

Organisation theory has, for a long time, been constrained in its development by the use of closed system models, which predispose the researcher to look for explanations and understandings of what the organisation is and what it does solely in terms of its internal characteristics. The tendency to investigate the organisation as though it were an entity, more or less closed to its social and technical milieu has simplified the problems of research a good deal and has facilitated the accumulation of a considerable amount of information concerning the internal structures and processes of

organisations. Studies of supervision techniques, incentive schemes, communications and control, for example, have reached quite a high level of sophistication and we have a small, but growing, collection of generalisable propositions concerning the relations amongst them. It is evident, however, that even if our understanding of these internal dimensions and our ability to measure them were vastly more advanced than it is now, we would still need to know a good deal more before we could fully understand even such gross phenomena as organisational survival or demise, growth or recession. A crucial part of what we need to know concerns the character of the environment within which the functions of the organisation have to be performed.

There seems generally to be a significant consensus on the judgment that one of the most significant weaknesses of contemporary organisation theory, as in psychology, is its failure to develop the means whereby systematic account can be taken of the interdependancies between an organisation or organism and its environment. While it has been usual to pay lipservice to the importance of 'taking the environment into account', it typically happens that the environment remains an amorphous, residual category, having no definition other than that it is 'non-organisation'.<sup>3</sup> Schein may be understating the case in saying: "The relationships between organisations and their environments are complex, and as yet not well conceptualised (Schein: 1965, 89).

This neglect of the environment in two areas of intellectual enquiry whose paramount concern is with the comprehension of

purposive behaviour (humanistic psychology and organisation theory), is, perhaps, not so surprising when we consider that an adequate understanding of the part played by the environment in purposeful activity has been dependent upon the conjunction of two very important intellectual developments which have come to fruition in this century. The implications of these have not, however, been fully assimilated into empirical social science.

### Mechanism and Vitalism

The first of these was the reconciliation of mechanism and vitalism (or teleology) that made it possible to show that the purposeful behaviour of living individuals, which is characterised by a certain freedom of choice, is compatible with a mechanical interpretation of the world. To a considerable extent this appears to have been the accomplishment of Edgar A. Singer. His analysis of the inadequacies of the solution to the mechanism-vitalism dilemma proposed by Kant, supported by his own proposal of a 'naturalistic' conception of purposive behaviour made possible by the identification and elaboration of the producer-product relationship, broke new ground in providing a respectable technology. In his own judgement:

For the naturalist, it is possible to accomplish what all history has shown to be desirable, but almost all past history has taken to be impossible: to see nature as an unbroken, determinate mechanism, the host and embodiment of a bio-centric world, populated by a vast variety of functional (not to say purposeful) beings, enjoying various degrees of indetermination (not to say freedom).  
(Singer: 1946:97)

It was Singer's work which provided the basis for the subsequent elaboration by Churchman, Ackoff, Emery and others of a consistent theoretical approach to the understanding of purposeful systems. Nearly forty years after Singer's fundamental clarification of the concept of purposiveness, the naive incorporation of the determinative concept into explanations of purposeful behaviour from the field of cybernetics continues on quite a massive scale, testifying to the durability of outdated thought-modes.

### The Importance of Context

The second development I have already referred to: the elaboration of a pragmatist or contextualist interpretive scheme, distinguished in its synthetic and dispersive mode of interpretation. While the development of a naturalistic concept of purpose may have been the more important condition, it seems unlikely that an appreciation of the environmental domain which is conceptually systematic, and at the same time theoretically relevant to the understanding of adaptive behaviour, could have emerged from the interpretive scheme of any of the other root metaphors - formism, mechanism, or organicism. The two analytical types - formism and mechanism - simply do not encourage any investigation of the contexts in which the units of study occur. The analysis of wholes entails reducing them to their constituent elements, the properties and relations of which are then investigated. Comprehension of the whole is the product of the mental process of 'reconstructing' the whole.

Contextualism, on the other hand, encourages the open system perspective, and searches for an understanding of wholes which takes account of their contexts.

A part, then, can never be described in isolation. A whole composed of isolable parts is an illusion. Element analysis in the sense of breaking a thing down to isolated elements, is consequently impossible. What then do we do, when we think we analyse a whole? ... What we actually do is to trace the strands of the given texture into some other texture or set of textures which have proved to be convenient instruments of control.  
(Pepper: 1934:112)

Thus the musical scale provides the 'instrument of control' for analysing a melody. Organicism, like mechanism, has an integrative bias that directs attention to the appearances of integration in the universe, which, in exaggerated forms, is regarded almost as a time-independent phenomenon.

Contextualism, on the other hand, takes cognisance of the duration and spread of events, acts and processes as a basic rather than a secondary factor - it is dispersive.

Contextualism is accordingly sometimes said to have a horizontal cosmology, in contrast to other views, which have a vertical cosmology. There is no top nor bottom to the contextualist's world. The formism or organicism one has only to analyse in certain specified ways and one is bound, so it is believed, ultimately to get to the bottom of things or to the top of things. Contextualism justifies no such faith.  
(Pepper: 1934:251)

For these reasons, contextualism seems to be the most appropriate world hypothesis to employ in conjunction with a naturalistic teleology, when the task is to understand sequences of purposive behaviour in environments which are usually complex and dynamic.

## The Causal Texture of the Environment

A major exception to the general neglect of the environment dimension on the part of behavioural scientists is a line of theoretical development in psychology that has its origins in the 'gestalt' psychology that arose in Germany during the first decades of this century. The concepts of gestalt psychology developed by Wertheimer, Kohler and Koffka are clearly contextualist in nature, being a direct reaction against the 'atomistic' psychology of the previous century.<sup>4</sup> The development of a conceptual scheme for treating the 'ecological' (environmental) phases of behaviour as a quasi-independent realm can be traced from the early Gestalists, through the molar behaviourism of Tolman and Brunswick and the work of Lewin and others at the Psychological Institute of Berlin, to the contemporary development of 'ecological psychology' by Barker and the incorporation of the essential parts of this earlier theorising into systems thinking by Emery and Trist.

In explicating the concept of environment to be used in this study, it will be helpful to consider briefly some of the more important contributions to this line of theoretical development. It will also help us to see the way in which contextualist thinking and a naturalistic teleology have combined to provide the orientation and concepts essential to an appreciation of the environment as a 'causal texture'.

Heider's seminal paper, 'Thing and Medium', although only fairly recently brought to light, was originally published in 1926, and constitutes an important milestone in the investigation of the extra-personal dimensions of psychological events (Heider: 1959). Whereas previous psychology had been preoccupied with processes going on at the receptor surfaces of organisms, as far as the problems of perception and stimuli were concerned, Heider drew a distinction between the physical characteristics of the objects of perception and the characteristic processes that mediate between them and the perceiving organism - between 'things' and 'media'. He thus widened the traditional unit of perception by extending it out into the environment and drawing attention to the fact that distal objects at the origin of the perceptual unit (such as a stone) have quite different physical properties from the medium that intervenes between these objects and the proximal stimulus on the receptor surface (a pattern of light rays reflected from a stone). Media have the necessary and important quality that their parts are independent - it is this quality that allows them to 'transmit' the characteristics of things. The quality of a medium is thus dependent on the number of its parts and their 'docility' - the relative ease with which they can be externally constrained by things. The complexity of the textures that can pass through the medium is a function of its variability and the resistance it offers. Differential qualities of media are represented in the differences, for example, between coarse and fine grain photography, and between languages with relatively larger or smaller vocabularies. Writing an introduction to his paper for its publication, Heider says:

...it deals with the process that starts at the perceived object (the distal stimulus) and which ends with the stimuli impinging on the sense organs (the proximal stimuli). This process lies entirely in the environment and goes on whether or not there is an organism affected by the proximal stimuli. It belongs to what Brunswick has called the ecological phase of the causal sequence. It precedes the phase which occurs within the organism and which so far has been the focus of attention in most studies of perception. Since perception is adapted to the environment, it is obvious that we must be familiar with the environmental structures to which it is adapted if we are to get a comprehensive understanding of it.  
(Heider: 1959,:ix)

Klein's 'note to the reader' in the same volume points out that:

A unique feature of Heider's approach is his attempt to fathom environmental structure not from the response side - from the inside outward, as it were, as is common in psychological theories - but from the outside inward, that is, by specifying the architectural rules of the extrapersonal world of physical object and event units.  
(Heider: 1959:vii)

Although there is little evidence that the insights of 'Thing and Medium' were widely recognised at that time, Heider's work did have an influence on, among others, Koffka, Lewin, Brunswick and Barker, all of whom have referred to his work in formulating their own important contributions. His discrimination of environments into things and media and the recognition of significant processes which occur in the environmental sector quite independently of the organism are of fundamental importance to the comprehension of interactions between purposeful systems and their environments.<sup>5</sup>

Tolman was not one of those who took up Heider's work, but his development of a 'purposive behaviourism' was, perhaps, the

first major theoretical work to bring together gestalt psychology and the problems of purposive behaviour. (Tolman: 1932). Behaviour, for Tolman, is a molar phenomenon, standing in contrast to the molecular behaviourism of Watson. Behaviour acts are not reducible to the underlying molecular facts of physiology and physics, but have 'certain emergent properties of their own'. In his analysis, the two identifying properties of behaviour are its initiating causes (which can be either environmental stimuli or initiating physiological states), and the behaviour determinants. As Pepper has shown (Pepper: 1934), the two most significant of the behaviour determinants are the state of purpose of the organism and the cognitive imminent determinants. The state of purpose is an innate or acquired urge for the attainment of, or escape from, some sort of environmental object or physiological state, while the cognitive determinants of a behaviour act encompass the character of the goal object (meaning either that which is to be sought or that which is to be avoided), its 'location' relative to actual and possible means-objects, and the character of the means-objects themselves. These three cognitive determinants fuse into a sign-gestalt, which, in turn, fuses with the purposive behaviour determinant in the carrying through of a behaviour act.

Tolman's book is widely regarded as a landmark in theoretical psychology. Perhaps its most significant contribution, from my point of view, is the elaboration of a molar (or gestalt) conception of the behaviour act as a causal sequence, which both begins and ends in the environment, being mediated through the acting organism:

(Our system) conceives mental processes as functional varieties intervening between stimuli, initiating physiological status, and the general heredity and past training of the organism, on the one hand and final resulting responses on the other.  
(Tolman: 1932:414)

His characterisation of the environment itself in terms of goal-objects and means, their properties and the relations between them, is suggestive but relatively rudimentary.

Tolman's subsequent collaboration with Brunswick had the benefits both of Pepper's insightful analysis of the conceptual framework of 'Purposeful Behaviour in Animals and Men', and of Brunswick's familiarity with Heider's work. Their joint article, 'The Organism and the Causal Texture of the Environment', (Tolman and Brunswick: 1935) deals most explicitly with the composition of the environment as such and the implications in environmental variance for adaptive behaviours.

Their initial proposition is that psychology is primarily concerned with the methods of response of the organism to two characteristic features of the environment. Firstly, because the environment is a causal texture, in which events are regularly dependent upon one another, organisms come to accept some events as 'local representatives' of other events. In distance perception for example, a particular manifold of light rays is accepted as a local representative of the distant object. Secondly, these causal couplings between distal and proximal stimuli are, to a degree, equivocal - local representatives are not connected one-to-one with the entities represented. Moreover, the relationship between behaviour objects (or means-objects) in the environment, and the goals of

the organism, are similarly equivocal. Thus a given means-object will assist the attainment of a particular goal only with a certain degree of probability. Means objects in the environments or organisms have the characteristic, as Heider pointed out, of radiating causal trains (e.g. light waves) in many directions, quite independently of the organism, some of which may lead to its sensory surfaces.

What is then apprehended by the organism is not the object itself, but a cue for the object, which is only coupled to the object with a certain degree of reliability. This being so, they argue that the psychological 'success' of the organism will depend, firstly, on its ability to pick out the 'good' means objects for the attainment of particular goals, and, secondly, upon its ability to select the reliable cues for this 'good' means object. A hungry baby has to know what sorts of objects can potentially alleviate hunger, and what sorts of images, sounds and smells are reliable cues for such objects.

Means-objects must, in reality, be conceived as having three distinguishable aspects - they can be discriminated, manipulated and utilized. Discrimination properties are those whereby the object is differentiated from other objects - typically such properties as shape, colour, size, etc. The manipulation characteristics of an object are "the properties which make possible and support such and such actual behavioural manipulations. They are the object's grasp-ability, pick-up-ability, chew-ability ... and the like" (Tolman & Brunswick: 1935:53). Finally, the utilizable properties of a

behaviour object are "the ways in which the object, given the [manipulation properties] or the [manipulation and discrimination properties] combined, can be useful as a means for getting to further objects and goals." (Tolman & Brunswick: 1935:53). For example, a piece of chocolate within the visual field of a baby has the manipulation character of something chewable, and by virtue of this, also has the usable character of something which will lead toward a full stomach.

Their concluding remarks point to the ways in which structurally different environments may make differing demands on the organism's adaptive potential:

... we may say in general that in the selection both of the means-objects which have high probabilities and of the cues which have high probabilities the organism responds in the form of hypotheses. These hypotheses it brings with it from innate endowment and from previous experience. The hypotheses tend to be 'correct' for normal, average environments. When, however, the probabilities in the particular environment are not those of a 'normal' or average environment, then the organism, if it is not to go under, must acquire new hypotheses ... Thus the wholly successful organism would be one which brings, innately, normal averagely 'good' means-ends hypotheses and normally averagely 'reliable' perceptual hypotheses; but which can immediately modify these innate hypotheses to suit the special conditions of a special environment; which can note and include in its cue system and in its means-end system the presence of the further identifying features of these special environments.

(Tolman and Brunswick: 1935:71-2)

They give us the concept of environment as a causal texture, in which cues, means-objects and goals are causally interrelated in ways which can be quite independent of the organism. An organism's adjustment to its environment is a function of the

accuracy of the hypotheses it formulates about the pattern of causal couplings and its degree of flexibility in formulating new hypotheses and discarding old ones as the causal texture of the environment changes.

### The 'Whole Situation'

One of the main weaknesses, from my point of view, of the concept of environment so far developed is that it was treated in practice as a specialised, truncated part of the total situation, however much the full richness and complexity of real-life environments was acknowledged in my discussion. The work of Lewin and his followers has been very much concerned with the problems of systematizing and understanding of the relevance of the 'whole situation' to human behaviour. (Lewin: 1935, 1936).

Much of Lewin's thinking developed directly out of the work of Wertheimer, Kohler and Koffka, and he was for some time also an associate of Heider's, who, together with his wife, was responsible for the translation of 'Principles of Topological Psychology' into English; he also makes use of Tolman's work.

For Lewin, behaviour is a function of the individual's psychological life space, and the life space is constituted of the person and his psychological environment, the world as it is to him. The person and the environment are topologically distinguished, representing different regions of the life space. The life space has both structural and dynamic properties. The

basic structural concepts are region and boundary and from these more complex concepts to describe structural properties, such as degree of differentiation, centrality, path and distance, are derived. The dynamic concepts refer to the tendency of the life space to change or to resist change, and among the most important of them are the concepts of tension, force, field of forces, power and equilibrium. Although the life space refers to the total situation at a particular point of time, the Lewins' concept of causality is that of a contemporaneous relation; the 'time perspective' enters into the life space in the form of overlapping temporal gestalts - relevant pasts and futures are 'present' insofar as such phenomena as memory and expectation actually influence behaviour. In Lewin's work, we approach much closer to the idea of a freely variable environment in which the behaving individual has constantly to seek out those movements and locations, manipulations and responses from a complex and dynamic array of possibilities.

Deutsch writes:

The emphasis on the interrelatedness of the person and the environment was one of Lewin's major contributions to psychological theorising. Until recently, much of psychology has been dominated by what he has termed an "Aristotlean" model of thinking. In such thinking, psychological events are determined by the characteristics of the individual - instincts, heredity, intelligence, needs, habits, etc., - relatively independently of the situation. Since Lewin, it has become increasingly evident that it is meaningless to speak of behaviour without reference to both the person and his environment.  
(Deutsch: 1968:417)

In the context of the line of theoretical development being considered here, it is his elucidation of the 'spatial' dimensions of behaviour, bound up with the concepts of life space, 'field' and region, that adds most significantly to my developing concept of the environment.

#### The Geo-Behavioural Environment

I have already noted Chein's criticism of the neglect of the environment in theoretical psychology. His discussion of 'the environment as a determinant of behaviour', which those remarks preface, helps considerably to redress this weakness and is of the highest value as a systematic attempt to bring together in a comprehensive theoretical model many of the component features of environments that had been discussed in the work of Tolman, Lewin, Koffka and others (Chein: 1954). I have also referred to his concept of the geo-behavioural environment, which is a modification of the distinction drawn by Koffka between the 'geographic' and 'behavioural' environments. Whereas the behavioural environment refers to the individual's subjective interpretation of the world, the geo-behavioural environment is the geographic environment (the total objective physical and social environment) looked at from the point of view that is concerned with understanding behaviour, thus allowing for inclusion of elements that are not part of the individual's subjectively-interpreted world, but which do, nevertheless, have an observable impact on his behaviour. The 'major features' of the geo-behavioural environment which he discusses in turn are stimuli, goal objects and noxiants, supports and constraints and directors.

He defines a stimulus as "whatever is capable of initiating a change in the stream of activity ... a release or trigger mechanism". Stimuli initiate responses, but they do not determine a specific response, because any specific response is also a function of other environmental features. An advertisement for a brand of chocolate may lead to the consumption of some of that chocolate, but to say that this response is determined by the stimulus overlooks the role of other environmental features - the availability of the chocolate, possession of the money to purchase it with, etc. - which are also necessary conditions for that particular response. (I note here the direct connection between his concept of stimulus and the producer-product relation discussed above.) That a stimulus is something which can set off a response does not, he asserts, preclude the possibility that the same object or situation may also function in the role of goal object or noxiant, support, constraint or director. However, he goes on to make the following important observation:

It is the sometimes concurrence of these various roles in the same object that has led to what I believe is the common practice of overburdening the stimulus concept with the function of determining, as distinguished from initiating responses. The important point is that those various roles are always distinguishable and are often carried by distinct objects of situations.

(Chein: 1954:118)

Given the role of stimuli in initiating responses, the overall stimulus properties of an environment have some important psychological consequences. Either a dearth or an overabundance of stimuli may create quite severe problems of adjustment.

A relatively stimulus-less environment, for instance, is, I believe, an important factor in neurasthenia: the individual is thrown upon his self-stimulating resources which may prove insufficient for the initiation of activity. Conversely, an over-stimulating environment often generates profound problems of self-management; one of the things we must learn for instance, is not to respond to distracting stimuli.  
(Chein: 1954:118)

It is of interest to note that Toffler makes exactly the same observations and that he obviously sees 'future shock' as the counterpart of neurasthenia.

#### Goal Objects and Noxiants

'Goal objects' are objects or situations which can serve as need satisfiers and 'noxiants' are objects of situations which can produce pain or unpleasantness. Chein suggests that many psychologists have taken the existence of goal objects for granted and that they have, as a consequence, 'shown little interest in examining various environments, as such, from the point of view of what they have to offer by way of goal objects and/or noxiants'. (Chein: 1954:120). Environments clearly do have important differences in the abundance or scarcity of goal objects and noxiants and in the relative abundance of these in relation to certain needs as compared to others.

'Supports' are those features of the environment which make particular behaviours feasible, and 'constraints' are 'those features of the environment which preclude particular behaviours, make their occurrences less likely, or limit their variability'. The manipulation and the discrimination

properties of objects in situations as they were defined by Tolman and Brunswick are interpreted by Chein as environmental properties which set limits on what can and cannot be achieved - as supports and constraints. He treats 'cues' as a sub-class of discrimination - namely those discriminations which exist not in or of themselves 'but in systematic relationships to other discriminations, means-end paths, etc.' The colour green, or an apple, is discrimination, but insofar as colour is also correlated with taste and digestibility, colour is also a cue. Consistent with his definition of the geo-behavioural environment, Chein's cues are objective features of the environment and environments may, therefore, differ in the manner and variety of the cues that they present. In this view inappropriate or maladaptive behaviour may sometimes be the result of the absence of sufficient cues, or the existence of misleading or false cues and it is not automatically ascribable to human incapacity or ignorance. The distribution and nature of cases in an environment sets limits upon what may be learned in that environment. Behaviour is further supported or constrained according to the availability or non-availability of 'means-end paths'. This refers to 'the steps one must take or things one must do in order to attain particular goals or to avoid particular noxiants'. Means-end paths vary with respect to the characteristics of distance, quickness, freedom from barriers and viscosity - they define the conditions for the attainment of goals.

'Directors' are those features of the environment which tend to induce specific directions of behaviour'. Most importantly, the

particular spatio-temporal patterning of stimuli, goals and noxiants, supports and constraints, has the effect of 'channelling' behaviour in certain directions. For example, the absence of means-end paths to particular goals may direct behaviour towards other goals; being confronted with a new unexpected goal object at a particular time may divert behaviour in new directions; a means to an end may become an end in itself, due to the particular structure of the environment. In addition, the prevailing social values or norms of a particular culture, or of a particular behaviour setting, may act as directors.

### Environments

Finally, Chein draws attention to some of the global features of the environment, many of which have already been referred to here. Thus, some environments are more 'difficult' than others, some easier. Environments are more or less organised or disorganised, stable or unstable. From another point of view, the availability of goal objects, unavailability or noxiants, and the existing pattern of supports, constraints and directors, determine the number of degrees of freedom available to the individual in the geo-behavioural environment.

Emery and Trist's article on 'The causal texture of organisational environments' (Emery and Trist: 1965) appears to have been the first attempt towards some classification of environments which recognises that, like systems themselves, environments may differ systematically in their degree of

complexity. This paper has been discussed and extended by Terreberry (1968) and McWhinney (1968), and the schema presented in it have been amplified by the authors in subsequent publications (Emery: 1967; and Emery and Trist: 1972).

The article presents four ideal-type environments which are differentiated by qualitative dissimilarities in their causal texturing. It is premised on the view that the system behaviours in which they are interested (in this case the behaviours of organisations) can generally be represented as moving toward, or straining away from, certain ends, objects or situations, which can therefore be considered as either helps or hindrances to the system's survival and the performance of its functions.

Such a concept of the behavioural environment is found in a number of the writers that have been considered. Tolman, for instance, in the glossary to his book, defines 'purpose' as 'a demand to get to or from a given type of goal object. Such a purpose is testified to objectively by the fact that behaviour tends to persist to or from and to show docility relative to getting to or from specific types of goal object or goal situation'. A 'demand' is "an innate or acquired urge to get to or from some given instance or type of environmental presence or physiological quiescence or disturbance" (Tolman: 1932).

Angyal, in discussing the example of an animal hunting food, has written:

... one may say that the animal is driving to obtain food. Viewing the same occurrence with the object as the point of reference, one may say that the animal is attracted by

the sight of food. The whole biosphere of reference, appears as a system of attractive and repulsive environmental forces acting upon the organism... One frequently describes environmental objects and situations as attractive, repulsive, pleasing, challenging, seductive, trying, provoking, threatening, conducive to one or another type of activity.  
(Angyal: 1941:148)

He has noted, too, that Lewin's psychology is based on a similar concept of the role of environmental influences on behaviour.

Lewin refers to 'negative and positive balances', 'field forces' and 'demand qualities' of environmental-situations.

Environments are thus considered to be constituted of goals and noxious and environments may be differentiated according to the distribution of goals and noxious (random - clustered), their kinetic properties (placid - dynamic) and whether or not a given array of these 'environmental relevancies' is shared by more than one system.

#### 1. Placid-random environment

The simplest of the four types is that in which goals and noxious are 'relatively unchanging in themselves and randomly distributed'. Such environments are placid, not in the literal sense that they are tranquil or calm, but in the sense that they are, from the point of view of the system's activities, relatively docile, not offering active challenges or resistances. They are placid relative to other, more complexly joined environments, which have dynamic properties. They are random in the sense that goals and noxious do not occur in the environment in any meaningful or systematic patterns from the

system's point of view. It seems to be most useful to think of the 'pure' case of a placid-random environment not only as a construct, but also as a theoretical limiting case, or an extreme type, analogous for example, to the concepts of 'perfect competition' or 'absolute zero'. Such constructs can be used as a theoretical 'benchmark' when we are able to develop a 'comparative' or 'ordering concept'. In this case, a comparative concept for specifying degrees of randomness might be a valuable development when the concept of 'causal texture of the environment' is used in any particular investigation.

The type I environment corresponds to the idea of a flat surface over which an organism can move, which is bare apart from a number of widely scattered heaps of food (Simon: 1957,137). It corresponds also to the relevant environment of the 'flea-market' salesman. He is confronted by a market situation which is almost totally unstructured, so that the same sales approach is appropriate for all comers, and one 'mark' (customer) is as good as any other. Attempts to deliberately structure environments at this level for human beings have occurred in such settings as English madhouses, and in modern concentration camps. The environments of some relatively simple organisms such as an amoeba or a human foetus, seem to be of the placid-random type.

A further characteristic of the type I environment is that in environments of such relative simplicity it is essentially only the properties of the system itself that are critical to the effectiveness with which its function is performed. Of the set

of system-environment relations:  $(L_{11})$ ,  $(L_{12})$ ,  $(L_{21})$ ,  $(L_{22})$ , it is the  $(L_{11})$  relations the internal characteristics of the system, that are chiefly determinative of the effectiveness of behaviours in such environments. In the case of Simon's 'organism on a flat surface', for example, given the random availability of heaps of food, the survival of the organism is very much a function of such properties as its range of vision, its storage capacity and its mobility. Knowledge of internal properties alone can be predictive of system viability in the placid-random environment.

## 2. Placid-clustered environment

The second level of causal texturing differs from the random environment in that goals and noxiants are now clustered; they occur in patterned ways and with particular degrees of probability that are potentially 'knowable' by the system. When the environmental objects, events or situations which are potentially 'need satisfiers', and those which have detrimental or obnoxious consequences become regularly interdependent in time or space, significant variations are created in the 'supportiveness' of different parts of the environment - it becomes more heterogeneous than the random environment.

Clustering is the most important identifying characteristic - the goals and noxiants are still relatively unchanging in themselves.

The conception of the environment put forward by Tolman and Brunswick corresponds to the type II environment. When

environmental parts are joined in regular and predictable ways, some parts can come to act as cues, or 'local representatives', for other parts, or can have the character of means-objects for behaviour acts - the environment is a causal texture in which cues, means-objects and goal-objects are systematically interrelated. If the random environment is exemplified in Petticoat Lane, then the clustered environment corresponds more to the market situation of a country town general store. In this case, it pays to differentiate among customers on such dimensions as regulars passers-by, debtors creditors, big spenders and small spenders. Similarly, if the relevant environment for a person searching for shells on the sea-shore is a random environment, then the relevant environment for prospectors searching for oil or minerals is typically clustered - the occurrence of mineral resources is known to be correlated with certain topographical and geophysical features.

The factories spawned by the industrial revolution are the best example of environments of this type deliberately engineered for human beings. Significant variety in the work environment stemmed mainly from fluctuations in the physical demands of production processes and the variable desirability of available tasks. The environments of plants that are subject to the cycle of the seasons, and of human infants, also seem to be of this type.

In order to appreciate the relevance of clustering, one typically needs to have knowledge not only concerning the internal processes and properties of the system, ( $L_{11}$  relations)

but also concerning the capacity of the system to choose and implement alternative courses of action in response to environmental variations ( $L_{21}$  relations). The essential requirements for survival in clustered environments are to be found in the internal system processes and in the paths of influence or causal trains that originate within the system and extend out into the environment.

### 3. The disturbed-reactive environment

The type II environment represents a transformation of the random environment whereby goals and noxiants become clustered. The disturbed-reactive environment is characterised by a second qualitative change - it is a clustered environment in which there is more than one system of the same kind. The essential characteristic of the type III environment is the presence of more than one system performing the same function, for which, therefore, the same elements of the environment have relevance as goals and noxiants. This means that from the point of view of these systems, the environment can no longer be considered placid - it has active elements, and it is more appropriate to think of this and the succeeding type as dynamic environments.

An example of the type III environment is the state of affairs that exists when two or more timber-milling organisations are exploiting the same forest for timber, or when two or more fleets are fishing the same off-shore waters. The presence of a 'competitor' makes an important difference in an environment that is otherwise only clustered. The disturbed-reactive environment corresponds to the typical milieu for mature human

behaviour and is described in the economists' theory of oligopolistic markets. It is exemplified also in most forms of contests and games, in which competitors must act within certain defined boundary conditions so as to manipulate a variety of objects or situations with the aim of maintaining precedence over other.

The greater complexity of reactive environments is reflected in the fact that system viability now becomes dependent upon a third class of relations, in addition to the two that are critical in the clustered environment ( $L_{11}$  and  $L_{12}$ ). In an environment characterised by the existence of independent causal agents, knowledge of the ( $L_{21}$ ) relationships - causal paths or pressures originating within the environment which impact upon the system - become essential to comprehension of the system's activity.

#### 4. The turbulent environment

I have already discussed at some length the phenomena that are characteristic of extended social fields in a state of turbulence and have given some attention to the concept of turbulence. In the conceptual series elaborated by Emery and Trist, turbulent environments are, like type II environments, dynamic (and clustered); but unlike the reactive environment, they are characterised by dynamic processes occurring in the field itself, and not simply in the actions of other systems. The turbulent environment represents a transformation of the third level of causal texturing - it is a disturbed reactive environment, from which dynamic field processes have emerged as

an unintended result of the interactions of the constituent systems. (There are cases in which the field (or the 'ground') becomes dynamic, not as a consequence of the interactions of the relevant systems, but due to entirely heteronomous forces. A fishing fleet caught in a gale, or a village struck by a hurricane would be examples of this. These phenomena are not our concern. A useful analogy in understanding how turbulence arises is the effect of a company of soldiers marching over a suspension bridge. They may set up a resonance that leads to the bridge's 'self destruction'.

I have already used some examples of turbulence relating to ecological processes. If the type II environment corresponds to the relevant environment of a single milling enterprise exploiting a forest for timber, and type III corresponds to the new state of affairs created by other milling enterprises beginning operations in the same locality, the turbulent environment corresponds to the situation that can arise if the competing systems over-exploit the available timber, encouraging soil wash and erosion, and making regeneration difficult, if not impossible. We are increasingly alerted to the possibility that the continuous transformation of energy and the accompanying release of wastes into the atmosphere and into water systems may result in accumulations of noxious substances up to a 'critical mass' point, at which irreversible processes begin to take place in ecosystem balances. Instances of the Hegelian thesis that quantity can become quality are also found in the work of Calhoun and others on the effects of population density on animal behaviour. Again, there are critical points at which

qualitatively new processes begin to operate which cannot be accounted for in the same terms as the processes characteristic of interactions of individual systems.

In the case of social fields, there is a good deal to suggest that the dynamics of mob and riot situations correspond to a state of turbulence. The mutual excitation of emotionally charged individuals can lead to their joint engagement in activities that they would 'normally' never contemplate as individuals. Emery and Trist argue that turbulence arises in organisational environments as a result of increasing reliance on research and development, the deepening interdependence between the economic and other facets of society, radical increases in the volume and speed of communications and the sheer growth of organisations and linked sets of organisations to the point that they are so large that 'their actions are both persistent and strong enough to induce autochthonous processes in the environment'. (Emery & Trist: 1965:26).

In turbulent environments,  $(L_{11})$ ,  $(L_{12})$ , and  $(L_{21})$  relations are still of importance, but now  $(L_{22})$  relations the area of interdependancies that lies within the environment itself become of critical significance to the survival of the system and its ability to perform its function. As the examples that I have given illustrate, when turbulence arises the system's zone of free movement is largely dictated by processes which are entirely heteronomous with regard to the interactions between it and other systems occupying the field.

### 5. The vortical environment

Since these four levels of environment were first described in the literature, the possibility of a further level has been recognised, in which the environment takes on some of the properties of a vortex, whirlpool, or blackhole. Such environments must be thought of as entirely dynamic and having the capacity to swallow up or engross anything that approaches them.<sup>6</sup>

Natural events such as the whirlpool and the cyclone provide the model for such environments. In the environments of individuals, it may be that some mob situations have the same characteristics when the atmosphere attains a pitch of frenzy and compulsion that erases the individual's will and engrosses him 'involuntarily' in the mob behaviour. It has also been suggested that some of the rituals and ceremonies associated with conversion and indoctrination and with certain rites of passage in preliterate societies, have a similar effect on the individual subject, especially when the emotional intensity is enhanced by the use of pulsating music and chanting, and intoxicants. In this respect, such phenomena as 'Beatlemania', Bible Belt conversions in the American south and many primitive ceremonials may have a certain amount in common.

Emery (1971) has suggested that vortical processes may be set up within social fields, as in masses of fluid, where the parts of field are moving at quite different velocities. Just as in rivers, where eddies are set up at the interstices of bodies of water moving at different rates, so the frictions engendered by

segmentation of the social field and their differential rates of change may induce the forces operating in the field to assume a vortical dynamic. It is of interest to speculate whether for example, the outbreaks of racial violence at Sharpeville, Watts County, and Notting Hill coincide at all with locations and points of time in the social field where the differences between blacks and whites were perceived to be greatest.

In the vortical environment, ( $L_{22}$ ) relations alone have any significance, for the fate of any object or individual implicated in such a field or force is entirely determined by the character of the environment.

With regard to these five types of environment it should be emphasised that they are ideal types, and that the real environments in which empirical social science is interested are invariably 'mixtures' of them. The different facets of business activity, for example (purchasing, inventory control, production, maintenance, sales, research and development and so on), characteristically face environments of differing complexities, so that different demands are made on different sections of the organisation. It is, nevertheless, usually possible to characterise the overall environment of the organisation with respect to its dominant function. An individual's psychological environment at work may be stable and simple, while at home or in a love affair it is highly turbulent.

We can say, in general, that individuals and social systems engaged in purposive activity have to devote a good deal of time, energy and other resources to acquiring information about the structure and dynamics of their environments, and frequently also to manipulating and controlling the amount of environmental variance they have to confront. As I have suggested, for mature humans the normal amount of complexity experienced in their life space appears to correspond with the type 3 level.

Individuals in a simpler environment are likely to introduce more complexity if they are able, and to exploit existing variances to the full. Alexander Solzhenitsyn's novel "A day in the life of Ivan Denisovitch" is an insightful, though agonising, account of the efforts of an occupation camp internee to make the most of an incredibly monotonous, routine existence.<sup>7</sup>

In the more complex environments on the other hand, the typical response is to try to reduce the complexity of the environment to the familiar, disturbed-reactive level.

A particular advantage in identifying a number of types of environment is that it suggests a related set of distinctions which refer to the problems in purposeful behaviour of understanding and learning about the relevant environment and of finding ways in which it can be manipulated. These are problems of system adaptation. In the next chapter I discuss the concept of adaptation, the different strategies of adaptation that are appropriate to the five types of environment, and a number of characteristic maladaptions to turbulent environments.

## NOTES TO CHAPTER III

- 1 The publication by Maurer (1971), already cited, brings together a number of articles concerned with organisational environments.
- 2 See Aguilar (1967) for an analysis of the ways in which business firms scan, and obtain information about their environments.
- 3 There are a number of exceptions to this in recent organizational literature, as well as those in psychology which are about to be discussed. The pioneering study by Selznick (1940) and the important works by Katz and Kahn (1966) and Thompson (1967) are good examples.
- 4 See, in particular, Kohler (1929) and Koffka (1935).
- 5 The fullest expression of Heider's thinking is found in his "Psychology of Interpersonal Relations" (1958).
- 6 Some of the properties of a vortical environment are described in Edgar Alan Poe's short story "A descent into the Maelstrom", in which the narrator describes how he survived in the maelstrom, an intense tidal whirlpool off the Norwegian coast.
- 7 See Abel (1951) for a sociological analysis of the concentration camp.

**CHAPTER IV****ADAPTATION OF SYSTEMS TO THEIR ENVIRONMENTS**

The concept of adaptation is crucial to the development of this thesis in that in the chapters on planning discussed later, the interaction between individuals, communities and the environments in which they live is discussed. Here adaptation is developed as a theme from animals to humans, and the different influences of varying environments on adaptation is extended as a theme for analysis.

#### A CONCEPT OF ADAPTATION

The concepts of systems and environment have been discussed at some length. Open systems, I have shown, are in more or less constant commerce with the environments with which they must establish appropriate relations in order to be able to survive and go on performing their function. In the establishment of appropriate relations between the system and the environment, both the complexity of the environment and of the system itself are determinative factors. The greater the complexity of the system, in terms of the number of its parts and the range of activities they are capable of performing, the more chance it has, in any situation, of finding a response that is appropriate. The more uncertain and variable the environment, the greater the difficulty for any system to consistently behave in an appropriate manner. These are problems of adaptation.

One of the difficulties in trying to understand the processes whereby psychological individuals and social systems become, or fail to become, adapted to the environments in which they exist, is that while the concept of adaptation has been well developed

in the biological sciences, there has been no such development in the social sciences.

Biology has long been concerned with such apparently purpose-like processes as regulation, co-ordination, intergration and adaptation, as they are observed in both plant and animal life. Since Darwin's pioneering work we have come to understand a good deal about phylogenetic adaptations - those changes in the form and functions of an organism that accompany the evolution of its species as a whole, resulting from natural selection and genetic mutations. The neck of the giraffe, the streamlining of fish and the colouration of moths and butterflies that enables them to blend with their habitats are examples of phylogenetic adaptation.

A different class of adaptations accompanies the development of the single organism, both in its embryonic and maturation process, including its ability to learn those responses which are appropriate to particular environmental demands. The maturation of the human body, represented in sexual development and increases in strength and size, and the acclimatisation of plants and animals to local variations in climate are examples of ontogenetic adaptation.

Many organisms are capable, in addition, of exhibiting end-serving behaviours in response to the continuous flux of environmental events, ranging from the most highly sophisticated adaptive behaviours of men (which include symbolic responses such as speech and facial expression), through the manipulation

of means-objects such as sticks and push-buttons by monkeys and pigeons, to the simple approach-avoid tactics available to the lowest form of animal life. Instinctive behaviours and reflex actions constitute a further category of adaptations.

### Man and Environment

Men have found it of interest and value to enquire further and further into these processes whereby the interdependencies of species are established and regulated in the organic world and individual organisms accommodate themselves to the vagaries of their environments. Yet they have not wanted to see themselves as integrally involved in them. Man's unique capacity of rational thought and his subsequent creation of technology are typically presumed to have liberated him from this organic ecology, to the point where it can be imagined that our problem is not to adapt to the world, but to adapt the world to our requirements. Technology greatly exaggerates this presumed discontinuity between man and the rest of nature. It is difficult for us to feel closely implicated in the ecosystem where we live in highrise downtown apartments, or greatly dependent on organic food chains when our meals come tinned and synthetic from the supermarket.

As McHarty has pointed out, this human arrogance is compounded by the pervasiveness of the philosophy of Genesis, which expounds the view that 'man is exclusively divine', that 'man is given dominion over all the earth', and that man ought to 'multiply and subdue the earth':

The implications of this are very clear - there is one moral arena; that is, that the acts of man-to-man are scrutinised by God, the Archangels, the Church, the Priests and the Court, and if you covet your neighbour's wife, or any wife covets her neighbour's husband or if you commit adultery, or theft or murder, then God, the Archangels, the Church, the Priests and the Courts are looking for you, and if they catch you they will rap your knuckles or do something much worse. But if you want to kill off every whale, every ponderosa pine, every sequoia, if you want to kill the oceans you may do so because the acts of man-to-nature are not sacramental. Apparently God, the Archangels, the Church the Priests and the Courts don't give a damn, and so you may destroy all nature without any fear of retribution.  
(McHarg: 1971:641)

While it is, of course, true (as discussed above) that man has achieved a far greater independence from his environment than any other organism, it is nevertheless an ecological madness to premise our activities on a belief in the invulnerability of the human species, and it is fast becoming necessary for us to take a humbler view of the place of man in the universe and to recognise our complete interdependence with the rest of living and non-living things on the surface of the earth. The end of 'free fall' requires a radical review of the Gospel of Growth and the exploitative, competitive and xenophobic attitudes to the resources balance of the ecosystem that it nurtures.<sup>1</sup> One ingredient of a better appreciation of the symbiotic relations between man and his social life on the one hand, and the rest of the universe on the other, may be the development of a concept of adaptation that is appropriate to the behaviours of purposeful systems, and which is entirely consistent with biological concepts of adaptation that are relevant mainly to goal-directed behaviours.

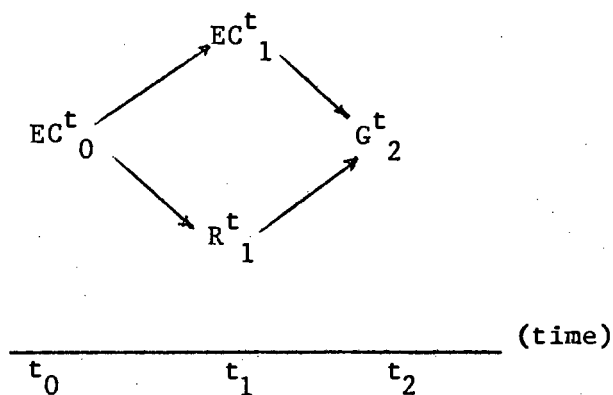
## Directive Correlation

An important move in this direction has been made in the work of Gerd Sommerhoff and his development of the concept of 'directive correlation' (1950, 1969). His starting point is that an adequate theoretical biology must have a concept of life and a way of distinguishing between living and non-living systems that is consistent with a mechanistic interpretation of the world. In a sense, therefore, his work parallels in biology the development of a naturalistic psychology.

He reviews a wide range of phenomena in nature that have the 'teleological' or end-oriented character of adaptive behaviour, and proposes that the common element in all such examples of adaptive behaviour is the concept of 'appropriate response', which he regards as linking together four spatio-temporally distinct elements in any actual example of adaptation:

1. Environmental circumstances (EC) or events which act as stimuli and evoke the response (R).
2. The response itself.
3. The environmental circumstances which the response meets during its execution and on which its success depends.
4. The occurrence of a certain event of state of affairs - the 'goal' of the response (g) - as an effect of the co-occurrence and interaction of (2) and (3).

Bearing in mind that the stimulus, the response and the goal are individuated by time, the notion of an appropriate response can be represented in the following schema:



(From Sommerhoff: 1950:p.44)

The response ( $R^t_1$ ) is appropriate insofar as it has the effect, in conjunction with the set of environmental circumstances with which its occurrence coincides, ( $EC^t_1$ ), of bringing about the state of affairs ( $G^t_2$ ).

Sommerhoff uses the example of an automatically sighted anti-aircraft gun:

1. In this case the stimulus  $S^t$  (corresponding to  $EC^t_0$  in the above diagram) is the appearance of a target within a given region.
2. The relevant part of the response is the line of fire adopted by the gun at time  $t_1$  ( $R^t_1$ ).
3. The relevant environmental circumstances coinciding with the firing of the gun are all those events and states of affairs external to the gun-aiming-and-firing system which have an effect on the path of the target and of the bullet during the time-in-flight of the latter (position, velocity, direction of target; strength of wind, etc.).
4. The 'goal' or criterion of appropriateness can be interpreted in two ways. Generally the gun may be said to have been aimed appropriately if its line of fire at the time of firing created the greatest probability feasible under the circumstances of the bullet hitting the target. This is usually a satisfactory criterion in view

of the fact that simplifying assumptions typically have to be made about the actual path of the target. In the more restrictive version, the gun is said to be aimed appropriately if and only if the bullet actually hits the target.

It is important to note that the significance of the time lapse between the environmental conditions or events which initiate the given response and those on which its effectiveness is held to be contingent is frequently not appreciated, due to the fact that the environmental conditions that evoke the response often remain constant. The example of the automatic gun takes account of the fact that relevant parts of the environment may be subject to change during the interval between an action being 'triggered off' and its completion. This factor is equally relevant to the case of a cat pouncing on a mouse or a man firing a rifle at a bird in flight.

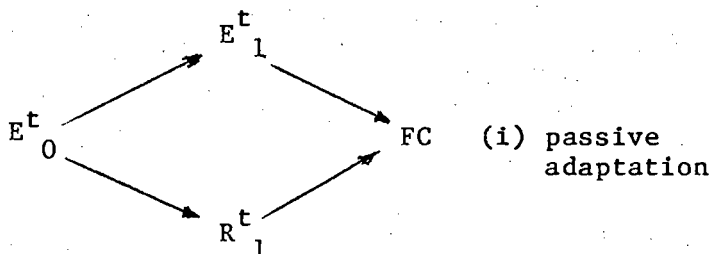
To say that a given response is appropriate does not only imply that it is effective, but entails, in addition, a comparison of the actual response and its corresponding environmental state with an extended range of alternative possible responses and states of the environment. To return to Sommerhoff's anti-aircraft gun example:

...the statement that a given line of fire is 'appropriate' in relation to a given course of the target asserts that the given course of the target is a member of a set of possible alternative courses and that the given line of fire is the corresponding member of a correlated set of possible alternative lines of fire, each member of the latter set being effective in conjunction with the corresponding member of the former.  
(Sommerhoff: 1950:45)

In view of the fact that an entirely accidental response could conceivably be appropriate under given circumstances (e.g., the accidental firing of a rifle might bring down a bird), the definition of adaptedness requires the further stipulation that it is a form of non-accidental appropriateness. To say that the gun is adapted to the path of its target implies not only that at a given moment the gun is so trained as to create the highest possibility of a hit being scored, but that also, within a given range of environmental variation (for example, a target moving in a different direction, or at a different velocity), the gun would have adopted a different line of fire, correlated with the changed characteristics of the target.

#### Passive Adaptation

Up to this point, only cases in which the changed initial conditions, that set off the adaptive response has been an environmental variable, and usually an antecedent value of the environmental variable with which the response is correlated, have been considered. However, the case of an animate or purely mechanical system repoding to a change in its environment represents only a limited class of all the events that can justifiably be called adaptive. I shall call such cases passive adaptation, and distinguish them from three other types of adaptation.

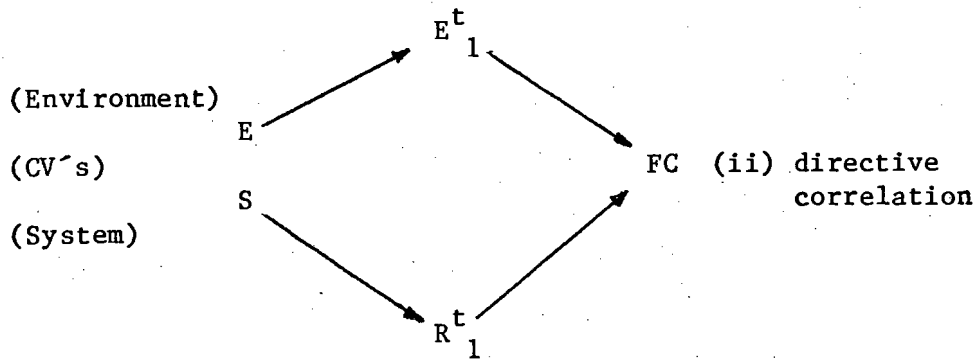


The response and the environmental conditions with which it coincides are jointly caused by a changed environmental condition ( $E_0^t$ ). As a result, the response is directly correlated with the state of the environment it meets during its execution, and these two variables together produce the goal, or focal condition (FC). Passive adaptation corresponds to the capabilities of reactive-functional and reactive multi-functional systems, which can select actions in response to environmental changes, that will maintain the performance of their function (e.g. a thermostat).

#### Coenetic Variables

The four essential aspects of this model of adaptedness and the relations between them generalised by Sommerhoff into his model of directive correlation are potentially much wider than in acts of passive adaptation, and are given the general name of 'coenetic variables' (from the Greek coenos: "beginning"). The coenetic variables need not be exclusively environmental variables, but may also be changes in the state of the system itself, such as the sensation of hunger or discomfort, the need for activity or rest, or the apprehension of danger. Neither therefore, in an instance of directive correlation, need the coenetic variable be an earlier value of the environmental circumstances with which the response is correlated. Correspondingly, directive correlation is not concerned simply with responses or reactions to variations occurring in the environment, but also incorporates goal-seeking behaviours. The essential requirement remains that ( $R_1^t$ ) and ( $Ect_1$ ) be so

related in terms of the objective properties of the physical system of which they are part, that they are both caused by, and are both responsive to, variations in the same coenetic variable.



Sommerhoff's formal definition of directive correlation is as follows:

Any event or state of affairs  $R_1^t$  occurring at a time  $t_1$  is directively correlated to a given simultaneous event or state of affairs  $E_1^t$  in respect of the subsequent occurrence of an event or state of affairs  $G_2^t$  if the physical system of which these are part is objectively so conditioned that there exists an event or state of affairs  $CVt_0$  prior to  $t_1$ , and a set of possible alternative values of  $CVt_0$ , such that:

- (a) under the given circumstances any variation of  $CVt_0$  within this set implies variations in both  $R_1^t$  and  $E_1^t$ ;
- (b) any such pair of varied values of  $R_1^t$ ,  $E_1^t$  (as well as the pair of their actual values) is a pair of corresponding members of two correlated sets of possible values  $R_1^t, R_1^{\prime t}, R_1^{\prime\prime t}, \dots$  and  $E_1^t, E_1^{\prime t}, E_1^{\prime\prime t}, \dots$ , which are such that under the circumstances all pairs of corresponding members, but no other pairs, cause the subsequent occurrence of  $G_2^t$ .  
(Sommerhoff: 1950:54-5)

The model of directive correlation, therefore, provides a categorically non-teleological definition of goal-directed behaviour, as borne out by the fact that it applies equally to

the actions of a purely mechanical system - a radar-controlled anti-aircraft gun - and the whole range of organic processes subsumed under the concepts of regulation, integration, co-ordination, organisation and the like, which have been the preoccupation of biologists.

Directive correlation, in short, is the fundamental and objective system-property which in more or less complex forms underlines the phenomena of adaptation in nature and their purpose-like character.  
(Sommerhoff: 1950:56)

Directive correlation refers to a characteristic of a system having more than one possible course of action available to it, such that within certain limits, it is able to select a course of action following a change in one of its own or an environmental property, that has the effect of enabling the system to go on performing its function.

### Active Adaptation

In presenting a consistent naturalistic model of adaptation that is appropriate to goal-seeking systems which may be either mechanical or animate in nature, Sommerhoff further avoids the problems of consciousness which are particularly distinctive of human behaviours:

... directive correlation is a physical property which can exist in a closed physical system without presupposing the presence within that system of a rational agent and of conscious mental processes, i.e. of processes which are purposive in the literal sense of the word and involve rational thought, the presence of visualised aims, and fixed resolutions in the mind of a thinking agent. It is therefore seen that conscious mental processes constitute but one of several possible mechanisms in nature which can cause a system to have the objective property of directive correlation.  
(Sommerhoff: 1950:66-7)

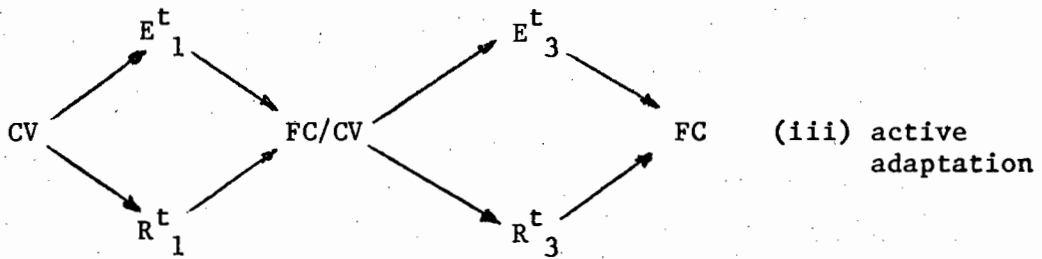
He does recognise that the rational behaviour of man -  
 'activities involving rational thought processes and proceeding  
 according to a preconceived plan, fixed resolution and conscious  
 purpose in the mind of the agent' - involves a type of adaptive  
 behaviour that is somewhat distinctive, and yet he comes to the  
 conclusion that:

... although rational thought is a powerful  
 instrument, it is neither a generally  
 necessary nor sufficient condition for the  
 objective adaptation of Man's behaviour to  
 his environment  
 (Sommerhoff: 1950:147)

The special significance of those adaptations which are the  
 result of rational behaviour and which, therefore, typify  
 behaviours found in social systems, has been clarified by Emery  
 in the distinction between active and passive adaptations  
 (Emery: 1967; see also Emery and Trist: 1972), and formally  
 distinguished by Ackoff and Emery in their definitions of  
 goal-directed and purposeful systems (1972). The concept of  
 active adaptation goes beyond directive correlations in  
 embracing systems of causal relationships in which the focal  
 conditions are wilfully induced changes in the state of the  
 system or its environment that enhance the range of responses  
 that will subsequently be adaptive. In other words, active  
 adaptation entails a system of directive correlations, in which  
 the circumstances that constitute the focal condition of the  
 first are deliberately created in order to become the starting  
 condition for subsequent adaptive behaviours. Emery gives the  
 example of man lighting a fire:

... his wit and action sets off an  
 environmental process that enables him by  
 appropriate responses to pursue goals of  
 warmth, cooking, of visual contact, of  
 security, of distillation, etc. Making fire

is not only an adaptive response to the sun going down but can be a starting condition for a range of other purposive activities. (Emery: 1967:201)



In Sommerhoff's model of directive correlation, the existence of some goals in the system's environment is taken for granted. It is a function of the eyes and other sense organs to identify and locate the need satisfiers and noxiants that come within the organism's sphere of influence and to establish the causal connections that enable environmental variables to become the coenetic variables of adaptive behaviour. The model is therefore most appropriate to the kinds of adaptations that occur in goal-direct behaviour.

With active adaptation, immediate actions do not usually result directly in attainment of the outcome sought, for the outcome may be extremely distant, having existence only as a mental image of the actor. Immediate actions are geared to the creation of future conditions which will make further adaptive responses possible, some of which have the character that they lead a step closer to the attainment of the mentally constructed or distant focal condition. The distant focal condition corresponds to the system's purpose and the more immediate ones to the various goals that are causally connected in the realisation of the purpose. The same purpose can be attained by a number of

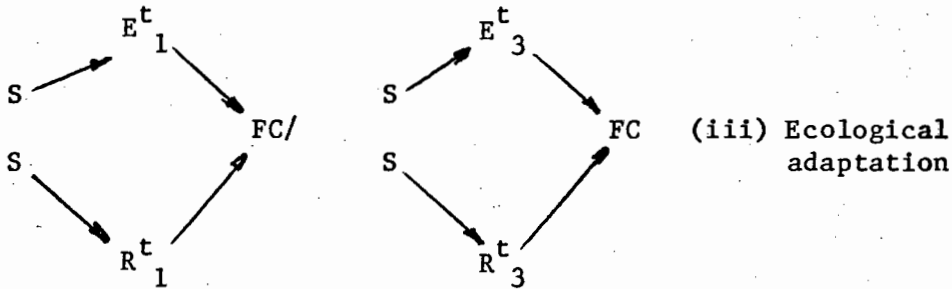
different series of directive correlations; a man, for example, can arrive at his destination by any combination of walking, running, catching a bus, riding a bicycle and so on. A concept of planning as a formalised method of active adaptation is elaborated upon later.

### Ecological Adaptation

In arguing that many of the environments in which the purposeful activities of individuals and organisations are carried out are becoming increasingly complex and uncertain, I noted that one of the consequences is that it becomes more difficult for individual systems to adapt by themselves, using only their own resources. It becomes increasingly necessary for systems commonly confronting a turbulent environment to act in concert in order to provide the minimum amount of stability needed for them to pursue their individual ends. I envisage, therefore, a fourth level of adaptation - ecological adaptation - which refers to systems of action in which a number of purposeful systems sharing the same environment consistently correlate their behaviours to one another for the purpose of rendering the effects of their separate activities more predictable, and, therefore, more susceptible to control.

According to the situation, this may mean coming to agreement on the general nature of the outcomes (focal conditions) to be sought, the means that may legitimately be employed, or the nature and range of initial conditions that are to be the basis for actions. The most effective way in which the adaptive

behaviours of large numbers of purposeful systems can become directly correlated amongst themselves appears to be through the search for and agreement upon shared values, including values which relate specifically to the maintenance of the stability of the social field.



In terms of my model, this means that the properties and behaviours of other systems come to constitute the coenetic variables in acts of purposeful behaviour.

This step in itself does not take me far beyond the notion of active adaptation, which already allows for the possibility that the sequences of directly correlated responses of the actor take into account the parts being played by other systems in the same environment. Relating this conceptual series of modes of adaptation to the system hierarchy formulated by Ackoff and Emery suggests that the significant step beyond the level of active adaptation entails an ecologically adapted series of directive correlations which envisages no end point; in which the correlated systems do not anticipate any final condition that would constitute the 'outcome' of their collaborative involvement. This implies that the behaviours of the ecologically interdependent systems must be appropriate to the pursuit of a common ideal or ideals, which pervade the action.

environment and become salient as field forces when choice points arise, disposing the connected systems to choose those behaviours which are most conducive to the realisation of the shared ideals (See, for example, Willener: 1970).

Whatever improved kind of understanding of social and psychological processes of adaptation the social sciences eventually arrive at, it is as well to appreciate, as Sommerhoff points out, that:

adaptability is never unlimited. It may be very extensive, as in the higher organisms and especially in man, but no living organism has the power to cope with all the conceivable challenges of its environment. On the contrary, the environmental changes which are possible in the normal routine of events are often so limited that as someone has put it, few animals have a chance to show how foolishly they would act under irregular circumstances.  
(Sommerhoff: 1950:19)

Clearly both the causal complexity of the environment and the variability available to the system in its actions are basic parameters of the degree of adaptation that is possible in any particular case. The success of an organism, individual or organisation in bringing about and maintaining the focal conditions that are appropriate to itself is a function of its ability to match the range of potential environmental states ( $E_1^t$ ) with a range of potential responses, such that for each ( $E_1^t$ ) there is an ( $R_1^t$ ) which would produce the same jointly caused, end result.

The directive correlation model suggests some objective measures of the limits of adaptability in particular cases; or, to

express it positively, of degree of adaptation. Adaptability can be measured in terms of the amount of variation of a coenetic variable over which directive correlation can be maintained, and the number of coenetic variables that exist for a particular system. The adaptability of the automatic gun is limited by the range of target velocities that it can cope with and a given range of target elevations. An air-conditioning system that controls for humidity as well as temperature is adapted to a wider range of environmental circumstances than the simple thermostat heating system.

In the following section I discuss the adaptation of systems in environments of differing levels of causal complexity. The concepts of adaptation developed here I connect with the five levels of environmental texturing that I outlined in the previous chapter.

### Environmental Complexity and Adaptation

#### 1. Adaptation to the placid-random environment

When the environmental relevancies for a particular system are 'randomised' - the 'goods' to be approached and the 'bads' to be avoided have a distribution that is unpredictable to the system - any behaviour is as good as any other. No behaviour of the system can intentionally be 'better' than any other, as there are no known variations in the distribution of goals and noxiants of which advantage can be taken. Actions may be selected fortuitously that are conducive to success, but such rewards cannot be anticipated in advance.

I find it difficult to conceive of any behaviour that could be called adaptive taking place in a purely random environment.

Sommerhoff seems to be of the same opinion:

The necessity for the existence of one or more coenetic variables in every case of adaption is also intuitively obvious. It is impossible for any machine or living organism to adapt a certain action to the environment unless it has information about the environment, i.e. unless it can be influenced by some features of the environment.

(Sommerhoff: 1950:53)

Sommerhoff's concept of appropriateness has no relevance. The system cannot formulate useful hypotheses about the environment because its parts do not appear to be joined in any regular way.

Schutzenburger's interpretation of system objectives in such environments is that "the optimal strategy is just the simple tactic of attempting to do one's best on a purely local basis" (Schutzenburger: 1954:101). If tactics refers to selecting an action from one's available repertoire, and strategy to the formulation of a 'strategic objective' - the position one wants to occupy at a future time - we can say that the discrimination between them is not relevant to random environments.

Further, it does not seem possible for learning to take place in such environments. The above quotation from Sommerhoff suggests that learning is related not only to the system having available to it the faculties of perception and memory and responses that would qualify as 'learning behaviour', but also (and independently) to the information structure of the environment. Chein has made this observation in discussing the role of cues

as a determinant of behaviour. Cues are properties of objects of situations 'which offer relevant information', in the sense that they are systematically related to other characteristics of objects or situations:

a 'cue' is an objective feature of the environment, it may not be utilised as such by the behaving individual and does not depend for its existence (though it may for its use) on the learning process or on some immediate or direct inference. The utilisation of cues may depend on learning and/or upon immediate and direct acts of inference; but this feature of the environment sets limits upon what may be learned or inferred, and it makes certain learnings or inferences more difficult than others.

(Chein: 1954:121)

Purely random environments are devoid of the cues that would make learning possible and regardless of the response capabilities of the system there does not appear to be any meaningful sense in which such environments could be learned.

All four types of systems can survive and perform their functions in this simplest level of environment, but all of them, except those which simply perform a function and do not pursue any goal, can go on operating in such environments only at the expense of forced redundancy in their capabilities. Goal-seeking, purposeful, and ideal-seeking systems all have capabilities that exceed the minimum requirements of the random environment. If we strictly observe the interpretation that no adaptation is possible at this level, then only passive functional and passive multi-functional systems exist in environments at this level without redundant capacity. Reactive functional and reactive multi-functional systems (a thermostat;

an aircraft's automatic pilot that controls heading and roll) are capable of passive adaptation and can, therefore, operate in environments which are in some way clustered. Systems occupying such environments are generally instruments of higher order systems and it is difficult to think of any systems naturally occurring at this level.

The examples that I have offered of random environments have all been the relevant environments of goal-seeking or purposeful systems, but we should note, in addition, that the relevant environments of parts of complex organisations are frequently maintained at this simple level for the same reasons that the regimes of lunatic asylums and concentration camps have approximated to the random field - control is made a good deal easier.

## 2. Adaptation to the placid-clustered environment

The type II environment represents a transformation of the random environment whereby the goals and noxiants become clustered. A system in an environment in which its 'need satisfiers' and those objects or situations which have detrimental consequences are regularly interdependent in temporal or spatial configurations, thereby giving rise to variations in the supportiveness of different parts of the environment, cannot expect to survive in the long run by the use of purely 'chance' behaviours or 'doing one's best on a purely local basis'. Clustering offers the possibility of improvement upon purely chance behaviours. It is no longer the case, as in the random environment, that pursuit of the nearest visible goal is as good as any other action:

To pursue the goal object that it can see, the goal object with which it is immediately confronted, may lead the system into parts of the field which are fraught with unforeseen difficulties. Similarly, avoiding a present difficulty may lead the system away from parts of the environment that are potentially rewarding.  
(Emery and Trist: 1972:46)

Clustering calls for the use of strategy rather than tactics.

Actions selected do not need only to satisfy the immediate situational demands; they need to belong to some ordered series of actions that are calculated to lead towards the strategic objective. In clustered environments the strategic objective can be appropriately conceptualised in locational terms - it is defining and moving towards the optimal location in the environment. Thus, for example, mineral prospectors with limited resources for surveys and drilling have literally to select the best locations they can on the basis of surface and strata variations. Similarly, a wise fisherman knows into which part of a river to drop his line. We see, therefore that, by contrast with the random environment, adaptation is not only possible, but is also necessary, if a system is to survive in a clustered environment in the long run. Useful hypotheses can be developed about the structure of these environments and they can assist the selection of appropriate actions.

It differs from the random environment also in that learning can take place. Some courses of action will now be repeatedly better than others for the attainment of particular ends. The support for associative, reinforcement or stimulus-response theories of learning has come very largely from the use of experimental situations which correspond to the clustered

environment, in which organisms are rewarded in some way when they have made "correct" hypotheses about the connectedness of parts of their environment.<sup>2</sup>

In order to adapt to a clustered environment, a system needs to be minimally goal-seeking. In various actual situations, it needs to be able to stick to courses of action that are determined more by the end that it seeks than by the proximal array of goals and noxiants. This of course is the meaning of strategy.

I mentioned that clustering is relevant also to the behaviour of reactive-functional systems. The distinction to be made is that for this class of systems, clustering has the effect of determining whether or not at any given time the system is performing its function, whereas in the case of goal-seeking systems the relevance of clustering is its influence over the effectiveness with which the system pursues its goal. The relevant environment of a thermostatically controlled heating system is fluctuations in the temperature of the air contiguous with its sensor. If, by chance, the room temperature corresponds to the level at which the thermostat has been set, the system does nothing. Such a system is adaptive because it can react to environmental changes in ways that have the effect of maintaining an environmental state. Variability in the environment is what makes such a system work, but variability cannot, in any sense, be exploited or taken advantage of by systems belonging to the functional class.

I propose, therefore, to reserve the term passive adaptation to refer to the capabilities of reactive functional and reactive multi-functional systems. These are generally state-maintaining systems of some kind. They simply react to fluctuations in an environmental condition or conditions in predetermined ways so as to go on producing a particular outcome. Goal-seeking systems, on the other hand, are capable of directively correlating their actions to variations in the state of the environment - they are responsive rather than simply reactive, in that they can choose their actions.

### 3. Adaptation to the disturbed-reactive environment

The new challenge to adaptation at this level is the presence in the same environment of a similar system. When the environment contains a "competitor", adaptive behaviour needs to take into account the information that the competitor has of the distribution of goals and noxiants (clustering), and what its probable courses of action are, as well as the distribution of goals and noxiants per se.

In this environment, each system does not simply have to take account of the other when they meet at random; but it has to consider that, what it knows about the environment can be known by another. That part of the environment to which it wishes to move is probably, for the same reason, the part to which the other wants to move. Knowing this, they will wish to improve their own chances by hindering the other, and they will know that the other will not only wish to do likewise but will know that they know this.

(Emery and Trist: 1972:49)

The term operation refers to the new requirement for adaptive behaviour. An operation is a "planned series of tactical

initiatives that are calculated not only to be adapted to the realisation of the system's goal, but also, in the process, to block or elicit certain courses of action that are available to the other systems. Although overall location in the field is still a relevant consideration for survival and effectiveness, the critical factor now tends to be "capacity or power to move more or less at will, i.e. to be able to make and meet competitive challenge" (Emery and Trist: 1965:26). In clustered environments, where the field as a whole is placid - relatively stable and predictable - most of the important sources of environmental variance may be coped with by the appropriate use of approach-avoid tactics, by hiding or hoarding. When the major sources of variance are other systems, then some active coming-to-terms between them is demanded. Except when it is decided to fight to the death, strategies of bargaining, coalition, co-operation, or competition will tend to become prevalent.

I have suggested that the clustered environment offers an information structure that allows systems with the requisite capacities (perception, memory, etc.) to learn by formulating and testing hypotheses concerning the regular connection of parts of the environment. The information structure of the disturbed-reactive environment is enriched by the fact that the cues (or coenetic variables) that can become variables in such hypotheses now include the behaviours of independent causal agents. The relevant set of causal interrelationships encompasses  $(L^{11})$ ,  $(L^{12})$ , and  $(L^{21})$  relations, so that distinctions can now be made between cases of system action and

environmental response and environmental pressure and system response. Given adequate levels of intelligence and memory, learning can now include 'theoretical' knowledge with regard to the possible combinations and recombinations of these interactive effects. The difference between the Type II and Type III environments in this regard is analogous to the difference between doing a jigsaw puzzle and playing chess.

In environments of this degree of causal complexity, adaptive behaviour requires that a system be able not only to select appropriate courses of action to enable it to move into and to exploit the 'richer' parts of its environment, but also that it be able to reconsider its goals. To be adapted in this type of environment therefore, a system needs to be at least a purposeful system; that is, a system which is capable of choosing both its actions and its outcomes under constant or varying environmental conditions.

To speak of a 'similar system' in a clustered environment means that a system (or systems) is present in that environment, the activity of which has the effect of reducing the effectiveness of the original system in the pursuit of its goal. As Thompson and McEwen have pointed out, in the case of formal organisations, the strategies of competition and co-operation, absorption and parasitism that are called for by this state of affairs, characteristically entail some surrender of autonomy in goal-setting (Thompson and McEwen: 1958). A good example of this is the recurring international fishery disputes over the boundaries of territorial waters. For as long as it meets no

competition, a fishing fleet operates in an environment that is clustered (i.e. fish are more likely to be found in certain locations under certain sea conditions than others). When other fishing fleets enter the same territory, a need develops to divide up the relevant environment if effectiveness in goal attainment of the individual fleets is to be maintained. Within industry as a whole the development of substitutes, such as plastics and synthetic fibres, has forced problems of goal re-formulation upon traditional industries, such as steel and wool.

#### 4. Adaptation to the turbulent environment

Questions concerning the system characteristics and the modes of adaption that are required by the causal texture of turbulent environments are, in a sense, the basic questions to be answered. At this stage only a sketch is presented, and the questions raised will be returned to and more thoroughly examined later, in Chapters 7 and 8.

Because my focus is on the behaviours of social systems, the kind of turbulence that I am chiefly interested in is that which is created by the interactions of purposeful systems - human individuals, groups and organisations. As I have already commented, the emergence of dynamic processes in the field itself means for the constituent systems a gross increase in their area of relevant uncertainty; the causal complexity of the environment is such as to render unpredictable and hence uncontrollable the effect of system actions and interactions. The national awakening of consumership in the US that followed

Ralph Nader's attack on the motor industry and the dramatic flare-up of opposition both on and off the campuses that followed the announcement of the invasion of Cambodia in 1970 are indicative of some dimensions of turbulence in American society.

In such environments, it does not seem possible for individual systems to formulate courses of action that would have a worthwhile probability of enabling them to maintain a level of efficiency in the performance of their function. Neither tactics, strategy, nor operations can be relied upon in a situation in which dynamic disturbances originate not only from competing systems but from the ground or the medium in which they operate. When change and complexity or environmental interconnectedness are ubiquitous, there is unlikely to be any location in the field that remains benign more than for a transient period. The aristocrats had nowhere to hide in the bloody days of the French Revolution. Neither is the mobilisation of power, and the capacity to move more or less at will, likely to be of much use in the long run when it is not a question of subordinating other systems, but of bringing order to the ground upon which they interact. It seems unlikely, for example, that government decrees and the threat of fines represent the solution to the ecological crisis.

The dominance of heteronomous events at this level suggests that a population of purposeful systems can best come to terms with turbulence by entering into joint, collaborative searches for solutions, premised on the recognition that their most

significant problems are common problems. Unlike the disturbed reactive environment, which requires some coming to terms between similar and dissimilar systems the fates of which are, to a degree, negatively correlated, the turbulent environment requires some coming to terms between both similar systems the fates of which are, to a significant degree, positively correlated. This idea has been presaged in my discussion of Trist's argument that welfare and development become increasingly interdependent as a society moves into post-industrialism (See Chapter 1). I am inclined to say, therefore, that insofar as adaptation is possible in the turbulent environment, it must be ecological adaptation, which entails the formulation of some shared principles to guide the responses of individual systems in their confrontations with the environment, by limiting the possible range of outcomes they can seek and the ways in which they seek them.

It seems for example, that the present state of industrial 'lawlessness' in Britain (early 1980's) is the result of a field of forces which is turbulent from the point of view of the parties centrally involved and which therefore requires measures of ecological adaption. Indeterminate relations among the government, the employers and the unions, manifested in the rash of official and unofficial strikes unrelated to wage-bargaining and the advocacy of repressive measures by employers and the government (even leaders of the Labour Party, the parliamentary opposition, have sought to impose fines on dissident unionists), have created a situation in which none of the parties involved seem able to achieve its aims in the long run. For the parties to persist in perceiving this as a conflict situation, and

selecting their responses accordingly, is inimical to the welfare of the larger systems of which they are all part and in the end probably to the parties themselves. What seems to be minimally required is a search for some common ground with regard to beliefs about the purposes to be served by the production system as a whole, and some shared understandings of the procedures appropriate to realising those purposes.

The point is, perhaps, more clearly demonstrated if we consider the helplessness of an individual caught up in a mob or riot situation who aspires to dampen or to divert the possibly violent or destructive direction of the energies engendered. Or we may return to the analogy of a company of soldiers marching over a suspension bridge; one soldier breaking step is unlikely to mitigate the effect created by the rest of the company, but if a sufficiently large number of them do so, destructive resonance can be avoided.

Emery and Trist have suggested that if there is a mechanism for coping with turbulent environments that is comparable to the employment of tactics, strategy, and operations at the simpler levels, it is likely to be 'the emergence of values that have overriding significance for all members of the field':

So far as effective values emerge, the character of richly joined, turbulent fields changes in a most striking fashion. The relevance of large classes of events no longer has to be sought in an intricate mesh of diverging causal strands, but is given directly in the ethical code. By this transformation a field is created which is no longer richly joined and turbulent but simplified and relatively static. Such a transformation will be regressive, or constructively adaptive, according to how far the emerging values adequately represent the new environmental requirements.  
(Emery and Trist: 1965:28)

Values and ideals, unlike goals and purposes, cannot easily be written into contractual relationships and other agreements that can be used to bring stability to the Type III environment, but require, above this, a level of mutual understanding and trust among the actors within a given field. It is at this level, therefore, that ideal-seeking, as opposed to purposeful behaviours, become significant in the adaptive potentials of behavioural systems.

Compared to the problems of identifying strategies of behaviour that are adaptive at this level of causal texturing, the task of identifying and describing a number of maladaptive strategies is one of relative ease. Accordingly, the next section I address to the exploration of a number of characteristic ways of behaving which are, in the long run at least, inappropriate in such environments. Such an analysis, it is hoped, will be of assistance in exploring further the system properties and strategies that are appropriate to conditions of turbulence.

#### Maladaptive Responses to Turbulence

I have argued that the social fields of advanced industrial societies are becoming increasingly turbulent as a concomitant of the drift into post-industrialism. I have also expressed the view that institutional arrangements for policy-formation, planning and decision-making in these technologically advanced societies have tended to lag behind the radical increase in the complexity of the environments in which plans and decisions have to be made.

Diagrammatic Summary of System-Environment Interrelationships

SYSTEM LEVEL		ADAPTATION	LEARNING	LEVEL OF ENVIRONMENT
FUNCTIONAL	PASSIVE FUNCTIONAL	NO ADAPTATION	NO LEARNING	I
	PASSIVE MULTI-FUNCTIONAL			
	REACTIVE FUNCTIONAL	PASSIVE ADAPTATION	CONDITIONING	II
	REACTIVE MULTI-FUNCTIONAL			
GOAL-SEEKING	GOAL-SEEKING	DIRECTIVE CORRELATION	MEANINGFUL LEARNING	
	MULTI-GOAL-SEEKING			
PURPOSEFUL	PURPOSEFUL	ACTIVE ADAPTATION	PROBLEM-SOLVING	III
IDEAL-SEEKING	IDEAL-SEEKING	ECOLOGICAL ADAPTATION	VICARIOUS TRIAL AND ERROR	IV
		NO ADAPTATION	NO LEARNING	V

On the one hand, the qualitative novelty of turbulence has commonly not been recognized for what it is, and large and powerful organisations have continued to behave in a manner appropriate to the disturbed-reactive level of complexity. This misperception, and its pathological consequences, has been more and more recognised and commented upon. In the context of societal planning, for example, Ozbekhan has observed:

At present, our perception is still largely governed by the world view of 19th century industrialism. Our problem is that the reality we are beginning to sense and with which we must deal belongs, by our own admission, to some other, newer order. It is the relationship principles of this newer reality that we are now called upon to define.

(Ozbekhan: 1969:52)

On the other hand, where the 'newer order' has at least been recognised, we have characteristically been predisposed to try to 'contain' its novel complexities by suppressing them and adopting a stance of more selective attention. By limiting our consideration to specialised parts, aspects of dimensions of turbulently connected fields, we may achieve the effect of 'downgrading' them to more simple levels for the purposes of our immediate responses. In the advanced societies that I am talking about, there are widely shared (if often poorly articulated) feelings that the real richness and complication of social decisions are actually avoided, by being successfully dealt with at a more primitive level, using such bureaucratic phenomena as routinisation, 'red tape', and impersonalisation. These pervasive disenchantments are often conveyed in the over-burdened concept of 'alienation'.

As I have shown, successful adaptation at any level of environmental complexity requires that a system be sensitive to the kind of causal texturing with which it is confronted and be able to select courses of action and choose behaviours that are appropriate to that environment. The choice of behaviours that would be appropriate at other levels than that which the system confronts is, in general, maladaptive, because they do not enable the system to go on performing its function in the long run without a reduction in its efficiency.

The challenges to the adaptive capabilities of individuals and social systems with which I have been most concerned are those which derive from the over-complexity of their environments; I have argued that over-complexity becomes a characteristic condition of social fields experiencing the transition to post-industrialism. Adaptation becomes prone to breakdown in the over-stimulating and unpredictable conditions of environmental turbulence. Responses which try to downgrade this level of complexity by reacting only to limited facets or dimensions of it, and responses which result from a misperception of the real level of complexity, may both be maladaptive in the long run. I shall refer to the former as passive maladaptations and to the latter as active maladaptations.

The active ones are responses which would be appropriate for the simpler reactive environments but which do not correspond to the demands of a turbulent environment. In such cases, some of the quantitative aspects of turbulence may be appreciated, evoking

the accumulation and mobilisation of greater and greater amounts of power, in an attempt to 'restore order'. It is, however, the qualitative novelty of the Type IV environment that has to be appreciated, particularly the overriding significance of heteronomous forces. To misperceive turbulence as simply a more complex form of the reactive environment encourages the persistence of Type III strategies of adaptation which are likely to be maladaptive in the long run. The passive responses are essentially defence mechanisms, which are calculated to downgrade the causal complexity of the environmental domain with which the system is immediately confronted, by artificially severing it from its wider context. These responses are passive because they are set off by environmental properties to which they attempt to conform rather than to manipulate.

Angyal's identification of three dimensions of living systems - depth, progression, and breadth - has suggested a second way of classifying maladaptive responses. The continuing viability of the system as a whole is a function of its ability to achieve a satisfactory level of integration of each of these three dimensions. Failure to do so results in a pathology of some sort.

1. The depth of vertical dimension refers to the 'system principle', or the basic trend of the organism. For individuals this basic trend is bipolar, embracing on the one hand a trend towards autonomy (independence from the environment) and on the other a trend towards homonomy (integration with superindividual units such as the group, society the cosmos, etc.) The two poles of the vertical dimension are the depth and the surface:

In the vertical structure the more superficial factor is a part of the immediately deeper factor. The relationship between part and whole in this dimension is that the part is a concretisation of the whole in some specific form... The person in his development not only acquires more effective ways of expression, but may acquire also greater depths... The depth is more essential and represents what one is, while the surface is more accidental and represents only what one does.  
(Angyal: 1941:266)

Integration in this dimension, therefore, requires that surface behaviours are consistently related to the deeper roots of the system - the basic structure in the case of individuals and fundamental cultural axioms in the case of social systems. The selection of what is to be responded to out of the 'blooming, buzzing confusion' of the existential world needs to be guided by these root principles.

## 2. The dimension of progression (the means-ends dimension)

refers to the functional 'division of labour' that is characteristic of all living systems, whereby the whole differentiates into parts that each contribute one or more functions to the outcomes of the whole. The outcomes and specific behaviours that are shaped by the basic trend of the organism through the vertical dimension can usually only be achieved through a number of successive stages - a means-ends chain that is directed to the outcomes of the system:

The position of every single behaviour can be defined both with regard to the vertical dimension of progression. A given activity may be looked upon as an organisation of means and ends, but at the same time this activity represents the satisfaction of some need which in turn is the surface manifestation of deeper tendencies.  
(Angyal: 1941:268)

Integration in this dimension is expressed in the 'economy' of the division of labour and the degree of articulation that is achieved among the system parts. The trend towards autonomy requires both that the system differentiate in order to adapt to a wider range of environmental variance (Ashby's 'law of requisite variety'), but also that newly differentiated parts are reintegrated into the total structure.

3. The breadth (or transverse) dimension refers to the lateral co-ordination of the various specific behaviours of the system, whereby they become or fail to become mutually consistent, or harmonious:

As we go from the depths to the surface the tendencies of the organism become not only more specific but more numerous. The same general tendency may seek expression in a number of ways. The various specific expressions of the same deeper tendency are not subordinated or superordinated to each other, but exist side by side... The organisation of parts into a whole along the transverse dimension can be called synergesis, or simply co-ordination. (Angyal: 1941:269)

Integration in this dimension has particular reference to the trend towards homonomy. There are some dimensions of the total system process - the strain towards the fullest realisation of the system principle - which require that certain constellations of units, processes, actions, etc. achieve consonance, or act in concert, with the effect that they individually enter into a larger whole, or gestalt. The movements of the various retinal, arm and finger muscles that are required by my writing this (but not necessarily of the muscles in my feet or back) must be co-ordinated and each enter into the total activity of writing.

Again the various configurations of units and part processes that need to be 'set' and 'shifted' from time to time for the carrying through of certain functions have to be in conformity to the structural principles of the system in order for integration of the lateral dimension to be maintained. Thus, the notes that are selected from a piano keyboard have to be selected according to some tonic principles if the resulting chord is to be 'integrated'.

Clearly these three dimensions are closely related to one another - they have the character of different facets of an act of behaving, when behaviours are seen as gestalten. Angyal offers the brief example of a person leaving the house and reaching for his hat:

This movement is composed of a number of co-ordinated muscle contractions (transverse dimension). This activity at the same time in a phase in a means-end organisation (dimension of progression). Furthermore it is a concrete expression of some tendency of the organism which can be traced back to more and more general tendencies (vertical dimension).  
(Angyal: 1941:270)

A well-integrated personality achieves good integration along all three dimensions, and disintegration (or 'segregation') in one dimension is usually followed by segregation in other dimensions.

Angyal's concepts were developed primarily to deal with the individual or the personality as a unit of study; or, more correctly, to interpret the personality-plus-environment system, which he calls the 'biosphere', as an organized whole. The biosphere is literally 'the realm of sphere of life':

The biosphere includes both the individual and the environment, not as interacting parts, not as constituents which have independent existence, but as aspects of a single reality which can be separated only by abstraction... Instead of studying the 'organism' and the 'environment' and their interaction, we propose to study life as a unitary whole and endeavour to describe the organisation and dynamics of the biosphere. (Angyal: 1941:100-1)

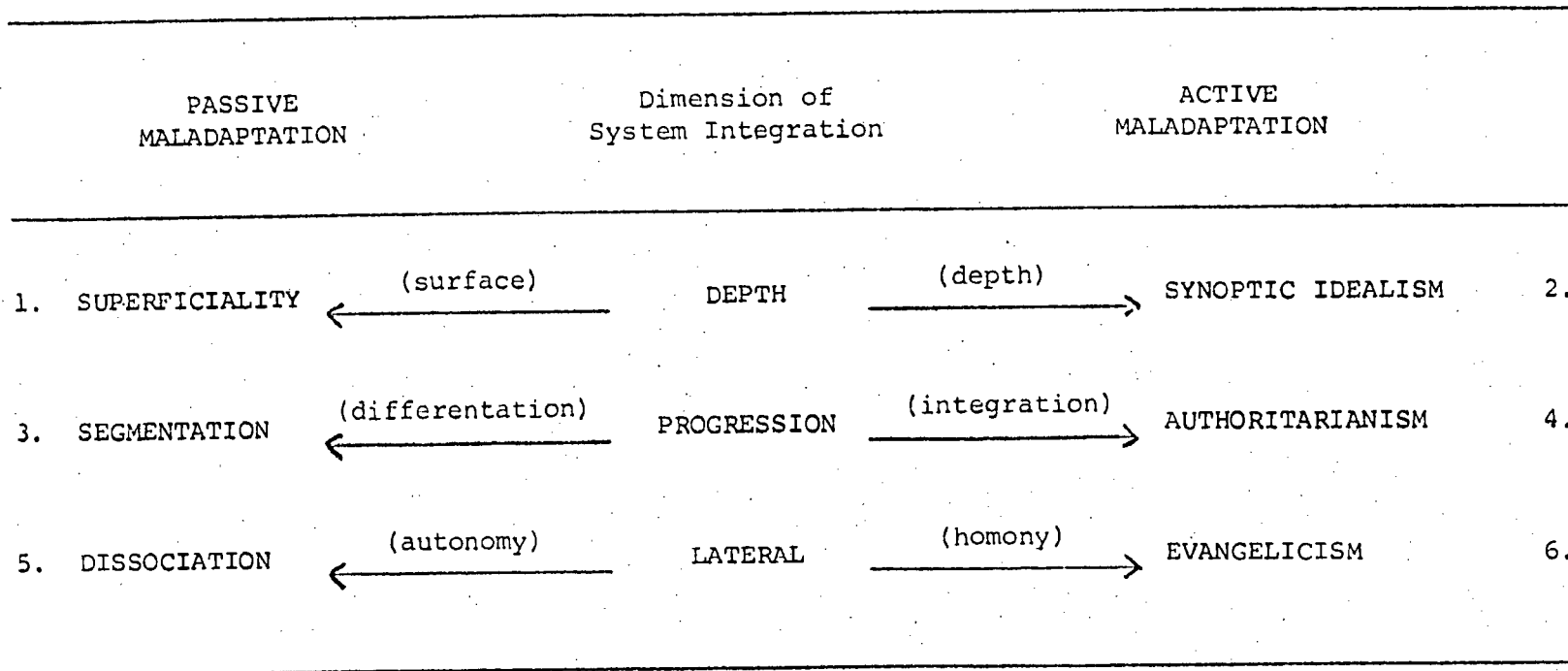
'Personality' denotes "the total organism when, as in man, the latter includes the social self and other factors which bind the individual into super-individual relationships" (Angyal: 1941: 200r).

His concepts for interpreting the biosphere translate readily and in a meaningful way to the level of social systems and the study of group behaviour because they are systems terms, and his study is a thorough and consistent application of the systems point of view. I conceptualise the realm of sphere in which social life takes place as the sociosphere, an organised whole which includes social systems and their environments, and interpret the degrees of integration within the sociosphere in terms of the same dimensions of depth, progression and breadth. As the individuality or uniqueness of the individual is expressed in his personality, so the individuality of the group or social system is expressed in its distinctive culture. Each of these concepts refers to the characteristic modes of organisation and ways of doing things that give rise to the important differences among groups and among individuals. The individuality of the group and the course of its behaviour can be understood in terms of its interdependencies within the sociosphere, in the same way that the personality is interpreted as a function of biospheric relations in Angyal's work.

By bringing together the three dimensions of system integration and the distinction between active and passive responses to environmental over-complexity, I arrive at a conceptual scheme which suggests a number of distinctive forms of maladaptation.

The drift into post-industrialism that is characterised by rapid, accelerating, but uneven, rates of change, and the increasing interdependency of the welfare of sub-systems places a strain upon the ability of the parts of the social structure to achieve a sufficient degree of integration along the three dimensions to which I have referred. The greater scheme of novelty, diversity and transience has the effect of creating an ever-widening range of conditions that have, somehow, to be taken into account, thereby producing pressures towards a greater differentiation of structure. Unevenness of change creates pressures towards segmentation, while the extension of 'organic' interdependence increases the need for the co-ordination of past activities.

Maladaptive Responses to Turbulent Social Fields



Pathologies of integration of the depth dimension

Successful integration is manifested in conformity of surface behaviours with the deeper roots of the system, cultural or psychic. This has the effect that what is chosen as the basis for action, and the courses of action that are selected, are shaped by the basic axioms of the system, and are not chosen capriciously or according to some principle that is unrelated to the essential structure of the system. When the system responds to over-complexity by a breakdown, or segregation, along the vertical dimension, I speak of superficiality. The active form of maladaptation is when the system responds to over-complexity by continuing to try to take everything into account, and I shall call this synoptic idealism.<sup>3</sup>

1. Superficiality

When there is a discontinuity in this dimension, according to Angyal:

.... tendencies in the depth of personality cannot express themselves in concrete surface manifestations; they remain repressed. Another aspect of the break or impairment of continuity of the vertical structure is that the surface manifestations no longer express deeper tendencies and thus become more or less empty.  
(Angyal: 1941:323)

The mechanisms that account for discontinuity of this sort on the personal level are typically some form of repression that amounts to the denial of one's own psyche. On the social level it is the denial through suppression or oppression of the deeper cultural bonds that tie people together.

Negation of these basic axioms leaves the way open for the operation of random or idiosyncratic criteria as the basis for actions. This may mean, for example, that one reacts only to the familiar, so that behaviour is guided by an exaggerated deference to custom and convention, leading to the personal or institutional rigidity of conservatism. Conformity is a slightly different reaction, resulting in subservience to fads and fashions which are, by nature, ephemeral and transient. Emery has suggested that trivialisation may be the dominant mode at the moment:

... if anything might lead to anything, then the motive for choice becomes pretty irrelevant and one chooses the familiar or the efficient.  
(Emery: 1971:663)

## 2. Synoptic idealism

Deviation in the opposite direction seems to entail an effort to take everything into account - to ignore no possibility, to leave no stone unturned. In this case, the choice of the bases of action is not irrelevant or unnecessarily restricted, but is quite unrealistically expanded. Remembering that power and the ability to move at will are key conditions for adaptation to disturbed reactive environments, we may say that the persistence of these lower level strategies in the turbulent environment represents a quest for the power of omniscience - to be able to rationally calculate upon all the values and the facts so as to arrive at the 'one best way' in every choice.

At the personal level, the economists' conceptual mutation 'rational economic man' has had to be endowed with omniscience.

It may be, that in real situations, the craving for

'rationality' in one's behaviour corresponds to emphasising analysis and objectivity at the expense of sensations and spontaneity as the basis for what one does. Such people are typically perceived as 'cold', and perhaps callous, in their interpersonal lives. At the institutional level, I am inclined to think that a preoccupation with rational decision-making and comprehensiveness in planning and policy-formation are often indicative of an unrealistic struggle for omniscience.

The 'Master Planning' ideology (that can still be found in the city planning profession), the rather utopian expectations among administrators concerning the ultimate utility of integrated data systems, mathematical modelling, cost-benefit analysis, PPBS and the like, and the tendency for social scientists to search for increased understanding by extending the number and variety of 'variables' handled, are all examples of the quest for a level of comprehensiveness that I am saying may be unattainable in the turbulent environment.<sup>4</sup> The limits of men's intellectual capacities, the multiplicity and fluidity of values, and the prohibitive cost of information-gathering are just some of the reasons why synoptic idealism is, in practice, impossible to sustain for complex situations. It may be that the ideal is maladapted even to the third level of environmental complexity, for comprehensiveness is really only a feasible aim when the system of events, situations, etc., to be acted upon is well understood and can be treated more or less as a closed system. What we can say is that comprehensiveness is successively less well adapted to the higher levels of environmental uncertainty and complexity.

### Pathologies of integration on the means-end dimension

Integration in this dimension requires the presence and the participation of those parts of sub-systems and their activities that are necessary for the system as a whole to carry out its functions. As I have shown, the development or growth of living systems involves a capacity both for differentiation and for the reintegration of specialising parts and functions into the total system process. When the processes of differentiation and integration of functions are well-balanced, there is an economical division of labour. When the integrative processes lag behind differentiation, segmentation occurs; when differentiation is suppressed or ignored and system energies are over-concentrated on integration, I shall speak of authoritarianism.

#### 3. Segmentation

Segmentation refers to a breakdown along the dimension of progression - a breakdown in relations among the parts and part activities that constitute the successive phases in the realisation of the wider system outcomes. Angyal refers to two aspects of disintegration along the means-end dimension. On the one hand a course of action may be left unfinished: "... the activity is aborted before it can go to completion. In such a case we may speak of frustration", and on the other, parts of sub-systems may become segregated: "Subordinate goals may become independent and lose contact with the main goal of activity. This may result in a fragmentation and disintegration of the total function." (Angyal: 1941:324).

The separation of parts so that they begin to pursue their own goals at the expense of the larger systems of which they are part is of special concern to the understanding of social phenomena. At the individual level the withdrawal of one's contribution from a group or communal activity, or placing the value of independence and the achievement of one's personal goals above the ends pursued by the collectivity result in a weakening of the group's potential energies. The organisational phenomenon of 'goal-displacement' - the tendency of the differentiated parts of the organisation to become preoccupied with the attainment of their own limited missions, even when this no longer serves or is threatening to the institutional mission - is an instance of segmentation that has been much discussed by organisation theorists. At the societal level I have already referred to the dangers of parts of the structure being left behind by the onward rush of technological change and mass affluence. It is (curiously) the wealthiest and most developed societies that experience the greatest difficulty in integrating the poor, the elderly, the beats and drop-outs, and other minorities, even though in these societies such problems of integration are more and more perceived as critical.

#### 4. Authoritarianism

Authoritarianism represents an imbalance in the opposite direction - system energies are disproportionately applied to integrative processes at the expense of differentiation. The response to complexity in this case is not the withdrawal by part processes of their contribution to the whole activity, but an attempt to impose a more rigid structure on the means-end

dimension in order to ensure that all part activities are directly integrated with the system goal. While the passive form of maladaptation on the dimension of progression is the interruption of means-end chains, resulting in segmentation, the active form is found in the further elaboration and closer control of the means-end paths so that they converge upon a single pinnacle - the imposed, unequivocal goal of the system.

The active responses, I have suggested, result from a misperception of the environmental dynamic, and can never be successful in the long run. This may be the basis of the feeling among many people that the regime in South Africa will not be able to subjugate its black and coloured populations indefinitely. The fascist states of Hitler and Mussolini had legendary success in having the trains and buses running according to schedule, but only at the cost of a system of control and repression that was a self-defeating component of the fuller expression of the aims of the state. In this dimension it is not the power of omniscience that is most salient, but political power or the power of coercion. Although there may be some physiological or psychological states of the individual that correspond to a maladaptive subordination of all parts to the service of a single over-riding function, authoritarianism, in the sense I wish to convey, seems to be better understood as a reaction of social system. In the social field, power, in the sense of superordination, can also be formulated in terms of the various types of authority - charismatic, traditional and legal-rational. Appeals to bring back the birch, restore capital punishment, create compulsory

national service, extend censorship and the like, are frequently offered as solutions to the complexity and irregularity of social life whereby "law and order" might be restored.

#### Pathologies of integration on the lateral dimension

Integration along this dimension requires a certain degree of adequacy of the setting and shifting mechanisms available to the system as a whole whereby it is able to educe the co-operative participation of differing combinations of parts and part processes according to the particular demands placed upon the system or the particular end that it seeks. The parts of purposeful systems are systems themselves, and are subject to the dual trends towards autonomy and homonomy. To the extent that the autonomous tendencies of the parts prevail, the system as a whole is less able to employ them in the service of its ends and is weakened. Angyal has called this condition dissociation. When, on the other hand, the homonomous tendencies of the parts dominate, there is a shift towards the complete co-ordination and co-operation parts. I shall call this evangelicism.

#### 5. Dissociation

According to Angyal, dissociation "consists in a lack of co-ordination between the parts of the whole and manifests itself in a kind of dysplastic behaviour. By lack of co-ordination is meant not only motor inco-ordination, but also a lack of co-ordination between the various tendencies and attitudes of the person." (Angyal: 1941:324). The analogue for

social systems is the reluctance or unwillingness of individuals to identify themselves with or participate in common social activities. Some of the implications of this have been discussed by Emery and Trist:

Dissociation means a reduction in the average man's sense of responsibility for co-ordinating and regulating his behaviour with respect to the potential co-producers of his desired ends. For each such fractional reduction there is a marked multiplier effect. Special and massive social regulatory institutions have to be created... to carry responsibilities formerly implicit in the web of mutual support that constituted the social field.  
(Emery and Trist: 1972:66)

As a response to turbulence in the social field it amounts to 'feathering one's own nest' and 'looking after number one' at the expense of any co-operative search for solutions to one's own (and others') problems. The domination of autonomous tendencies over tendencies towards homonomy among the constituent parts of the field increases the freedom of movement of the individual parts at the expense of the ability of more inclusive, supra-individual systems to mobilise energies for collective tasks.

#### 6. Evangelicism

The active form of maladaptation in the lateral dimension corresponds to the domination of homonomic over autonomous tendencies, whereby all the parts of sub-systems become united according to some principle, so that they can only be set and shifted in unison. Such an arrangement has the effect of focussing the energies that are available for doing anything, and generally ensures a high level of predictability concerning

the behaviour of the whole system. The most important detrimental consequence is that it reduces the potential responsiveness and flexibility within the system, by reducing the number of ways in which the parts are able to combine and recombine in the face of variable environmental demands.

The term evangelicism I use because it is evocative of such notions as 'all pulling together' and 'entering into the brotherhood', as responses that are appropriate to the solution of personal bewilderment or disengagement. Thus, the religious evangelicist is inclined to appeal for a world brotherhood of man as a panacea for all existing ills, and the reforming zeal of urban progress associations and community development associations makes a fetish of 'community spirit'. It is intended in no way to disparage the noble sentiments of love and brotherhood as such. When, however, the solution to the problem of maintaining some order in a turbulent environment is sought in appeals to people's better instincts, all the evidence suggests that there is little ground for optimism regarding the maintenance of order in the long run. The principles whereby the parts become regimented need not be moral principles but may also be based on power or authority. In the army for example, unison of behaviours is based on discipline, which, while guaranteeing the performance of tasks, does so at the expense of overall responsiveness - 'you're not paid to think'. Such cases, however, shade off into the authoritarian responses.

If evangelicism in the turbulent environment corresponds to a vestigial power strategy for bringing order to the field, it

seems to be the power of love, or the power of emotional sanctions, that is appealed to, in contrast to the power of knowledge and coercive power on the other dimensions. It is the feeling that 'if only people would all be decent to one another, the world would be a far better place. Without disputing the worth of this as an ideal, while evangelical responses lack a programme for unification they are ultimately maladapted to the conditions of turbulence. In this respect, the United Nations and Billy Graham confront similar limitations.

To the extent that the depth, progression and lateral dimensions of the personality and of the social system necessarily cohere, it is to be expected that a breakdown in any of these dimensions will affect the extent of integration on the others. With regard to what we have called the passive maladaptations, Angyal says:

In cases of good integration the connections of a given biospheric occurrence extend over a wide range of systems, while in the case of segregation the biospheric occurrence becomes a more or less localised affair. We make such distinctions frequently in daily life, for example when we say that one person is doing something half-heartedly and that the other is involved 'body and soul'. Activities the connection of which with other parts of the personality are severed, are feeble, unenergetic... on the other hand, activities well integrated with the rest of the personality are more forceful, because they are supported, backed up, reinforced by many systems of the personality.

(Angyal: 1941:324:25)

With respect to the active maladaptations, the mutual penetration of authoritarian and evangelical dispositions is a common phenomenon. Religious systems premised on the

fundamental equality of men and dedicated to their universal brotherhood have demonstrated surprising capacities for using authoritarian structures and teachings in the pursuit of their mission, and autocratic regimes have rarely failed to invoke some moral, ethical or religious principle to justify their tyranny. The craving for omniscience, on the other hand, may be reflected in the drive toward the centralised control of authoritatarianism, and the elaboration of theologies and manifestoes as the underpinnings of evangelicism.

## NOTES TO CHAPTER IV

- 1 Such a review is advocated in the forceful polemic by Mishan (1967) against the 'ideology of growth'. It is an unexpected book from a highly reputed economist, and of the highest importance in drawing attention to the alternatives to 'growth mania'.
- 2 See Toda (1962) for a creative analogue to the clustered environment.
- 3 This term is adapted from Braybrooke and Lindblom (1963).
- 4 Boguslaw (1965) identifies the expanding breed of systems engineers as the 'new utopians', striving to eradicate human fallability by the design of complex engineering systems.

**CHAPTER V**

**STRATEGIC PLANNING**

My preceding work outlines a conceptual framework for the investigation of purposeful human and social behaviours, and the ways in which social aggregates become, or fail to become, adapted to the environmental conditions that they meet. I have argued that the nature of the environmental conditions for purposeful social activity - the overall properties of the social field - are, in many parts of the world, becoming subject to important qualitative changes, and that these changes demand a new type of response. I have further suggested that for new forms of response, or modes of adaptation, to become possible on a sufficient scale, some conventional ways of looking at the world will have to be replaced by a new appreciative system in which a critical element will be the recognition that ecological units must become the basis for achieving regulation.<sup>1</sup> The following chapters constitute an exploration of the usefulness of systems theory and the contextualist framework in apprehending the significance of these qualitative changes and suggests directions in which regulation might be sought.

In rapidly changing and uncertain environments, strategic planning becomes the dominant method of which social units at all levels attempt to regulate their relations with other parts of the field so as to be able to go on functioning effectively.

Loeks, for example, comments on American experienter:

Man's view of himself and the world he inhabits has been in the process of change since the beginning of time. In recent years, however, the rate of this change has been accelerating rapidly and in ways that have profound implications for planning.

As emerging national commitment to planning and development is being expressed in the form of strengthened public institutions for

its execution. At the same time the private sector is picking up steam in its efforts to relate its decisions to public policy. This is reflected by increasing use of the non-profit development corporation and the expanding effort that is being put into corporate planning. All of the above points up a rapidly enlarging consensus concerning the degree and kind of social intervention which should be brought to bear in the development of the environment. Dealing with change is becoming a pervasive activity and by ten to 15 years from now practically everyone will be in the act.

(Loeks: 1967:348,349)

Planning is therefore to be understood as a generalised way in which many kinds of social aggregates endeavour to become better adapted to the environmental circumstances with which they are confronted. It has generally become a distinctive form of activity in societies (or those parts of them in which type III environmental characteristics emerge) in which the actions of many independent causal agents have to be somehow regulated, if the consequences of their combined, as well as their separate, actions are to be subordinated to some concept of the welfare of the larger system of which they are a part. At the simpler levels, at which uncertainties of this sort are generally absent, a satisfactory level of integration may be obtained through reacting to disturbances after they have become manifest and pursuing present actions almost entirely on the basis of past experiences. This explains why, of all the particular expressions of planning, military planning - the formulation of battlefield strategies - has the most extensive history. In war, even societies at the very simplest levels of organisation have to evolve means for survival in a reactive field, and one of the principal means is planning.

Strategic Planning and the Social Sciences

There are I suggest, a number of reasons why it is becoming especially important for the social sciences to arrive at a better understanding of planning behaviour, the conditions that make it necessary, and the characteristic difficulties that it has to overcome. Fundamentally, the omnipresence and acceleration of change demand more and more that we decide in advance of taking action; that we deliberately survey alternative possible outcomes and take an active role in bringing about those which are considered preferable. As the rate and scale of change increases in industrial societies, so, too, does the need for planning. With the more leisurely scale of development of pre-industrial eras, the future generally arrived at an assimilable rate, carrying only occasional threats to traditional and established beliefs and ways of doing things. The rapid accumulation and dissemination of scientific knowledge and its application in society through technology has steadily eroded the validity of an 'extra-relative' view of the future (the belief that it would be some sort of continuation of past trends) and is rendering obsolete the ameliorative approach to policy-making, whereby major efforts are mounted only to remove existing ills.

We can no longer assume the continuous development of existing patterns of growth and decline and can no longer afford to react after events, but must struggle to anticipate them. The advent of post-industrialism establishes planning as a dominant mode of decision-making. Branch comments on this development:

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understanding of planning and our ability to plan have lagged

behind the transformations of the environments on which we plan and many of the complex systems for which we plan.

A third reason for studying planning presents us with a paradox. The creation and development of technology gives man an instrument for bringing nature more and more under his control, and thus liberates him from a rate of progress that is dictated by the processes of biological evolution. To be prosaic, we have created the capacity to be able, if we wish, to opt for unnatural selection and survival of the unfittest when technology is added as man's tool in the man-nature nexus. The extent of the liberation thus made possible is that we are now able, as Gabor has put it, to 'invent the future' (Gabor: 1963). The capacities of our existing technology, (let alone that which we can safely expect to be developed within the next decade or so) are sufficient for us to be able, in principle, to design and implement a considerable range of utopias that contain and augment only the best, and eliminate the worst of our present life situations. How is it, then, that the future presents such a chaotic prospect? The paradox becomes thin when we take into account that the viability of an invented future depends upon it being premised on the existing state of affairs and incorporating details of the path to be taken in arriving there. Nevertheless, the radical increase in our capacity for inventing the future gives us another reason for wanting to better understand the process of invention.

Fourthly, the new salience of 'the quality of life' in conceptions of the public good, and its implicit challenge to economic growth as an end in itself and the over-riding aim of governments, coincides with a widening conception of the tasks of societal planning (Davis & Cherns: 1975). Whereas prescriptions for economic growth can be formulated by a relatively small coterie of wizards advising governments, the problems of improving the quality of life are less amenable to expertise, and the search for solutions calls for the involvement of larger and larger numbers of people. Past and continuing trends towards the urbanisation of larger proportions of the populations in industrial nations mean that the critical sphere in which these 'quality of life' problems have to be confronted is the urban environment.

We are already experiencing a growing concern with the quality of the urban environment as human habitat, and it seems reasonable to expect that in the coming decades the horizons of both public and private planning will increasingly extend further beyond investment policy and budgetary control, encompassing other social goods besides affluence. The nature of the alternatives has been eloquently expressed by Galbraith:

There is little real advantage in a handsome income for food, clothing, houseroom, furniture, alcohol and private entertainment in a city where one cannot move in the traffic, venture out safely at night, or plough through the accumulated trash. If the New York air continues to deteriorate, the freedom of those who inveigh against public outlays will be mostly available in the next world.

(Galbraith, quoted in Healey: 1971)

The fitness of the environment and the quality of their primary social worlds are, for the masses of people, far more immediate and tangible issues than balance of payments deficits and growth rates. To the extent, therefore, that they replace "growthmania" as the priority of national and local governments, it may be anticipated that involvement in planning will become a more common experience.

Finally, I note that sociology, and the social sciences in general, have given relatively little attention to planning as a characteristic form of human activity, nor to the future as a boundary to social life and a domain that urgently needs to be understood. Planners and planning organisations have been the subject of some empirical investigations, and the cover blurb to "Future Shock" notes that Alvin Toffler gave what must have been one of the first courses on "the sociology of the future" at the New School for Social Research. Although there now appear to be more and more social scientists joining planning organisations, the claims of city planners in particular that they have been rather poorly served by the social sciences seem justified. On reading the city planning literature, I am struck by the frequency with which the works of Herbert Gans are cited. As one of the few sociologists who have made planning their main professional interest, his works are constantly appealed to as offering the imprimatur of the sociologist. That they are also a valuable contribution does not hide the fact that there are few others to which one can appeal.

Of the vast amount that has been written on 'social change', very little seems to have been designed in any way to influence it. In his detailed report on 'the sociologist and the study of the future', Winthrop states that:

Professionally it appears to be permissible to examine social change both currently and retrospectively. To move on time's arrow towards the future however, is to be guilty of constructing utopias... The irony in current developments in studies of the future is that some of the natural scientists and engineers working in this new area are less modest and are assuming the role of social philosophers - a role which the more cautious sociologist has thus far been willing to abdicate.  
(Winthrop: 1968:136)

Wilbert Moore, who has himself made a considerable contribution to the literature of social change, devoted his 1966 presidential address to the American Sociological Association to the topic of 'the utility of utopias', in which he put forward some reasons for the demise of the utopian tradition in sociology and urged that it again be brought to life. The factors militating against utopian thought in sociology and a more activist orientation to the future are the tendency to accept revolutionary models of social systems, in which change is a 'chance' phenomenon arising from interconnectedness; the adoption of a metaphysic which devalues the role of large-scale purposeful behaviour in society in bringing about social change through various types of planning; the negativism towards utopian thinking induced by Marxist ideology; and preoccupation with a closed system methodology for analysing relations among variables. On this last point he comments:

Analysis of the relations among social phenomena by treating them as parts of a system does not intrinsically require that the system remain in a steady state. The

analysis is usually easier, however, if that assumption is made. Almost all of our analytical methods...are designed to extract more and more information about covariance. (Moore: 1966:766)

Moore responds to his own question 'have we any obligations as social scientists to start taking account not only of the changeful quality of social life but also of the fact that some portion of that change is deliberate?', with the view that 'sociologists have some scientific stake in forecasting and even in implementing the future that is hopefully better than the present'. There have been few signs of the profession taking him very seriously. While it is beyond dispute that studies of how societies have changed form an essential part of our understanding of the way society is now, it seems important that such understandings be geared more often to charting a course into the future.

While it is in organisations that much of the novelty, innovation and change to which adjustment is required, and it is in organisations that some of the greatest strains are experienced in handling the new uncertainties that they foster, the 'sociology of organisations' has maintained an empirical and nomothetic stance, addressing itself to the 'facts' and sifting these for generalisations. This activity, too, has its uses, but what seems to be more urgent is for sociologists to engage in the burgeoning spheres of O.D., corporate planning, and programmes of industrial democracy, as catalysts for the processes of change as well as impartial observers of them.

The barriers to a greater engagement of the social sciences in the processes of societal planning and to enquiry into the shape of the future seem to be located in the guiding principles of value neutrality, and the veneration of 'data' and objectivity to which this principles is conducive. If, as many believe, the social sciences have an increasingly important role to play in regulating the transition towards post-industrialism, by devising strategies of change and accommodation, and by identifying and exposing the values that are more likely to permit the attainment of at least some of our chosen ends, it would seem to be essential that more room is found in their professional bodies and academic associations for value commitment and speculation, so that passionate beliefs and 'really crazy ideas' are not lost to the search for solutions.<sup>2</sup>

The best knowledge of how organisations and larger social systems have changed up to now may be of limited value in coping with the type and scale of change that is to come, and it may become more necessary, from time to time, to abandon the methodological rigidities of value freedom and sticking to the facts if social science is to be of assistance in preparing us for the future.

#### The Future as the Planner's Environment

The principal difference between planning and other forms of adaptive social behaviour is that planning is specifically oriented to coping with uncertainties and opportunities affecting large social aggregates which are seen to lie not so much in the immediate as in the more distinct future. It is a

process of decision-making that is less concerned with finding solutions to immediate demands and hazards, than with working out before actions are required, what might constitute an appropriate response to emerging, or even possible, future states of affairs. It is, as Ackoff has said, a form of anticipatory decision-making - something done in advance of taking action (Ackoff: 1970a). Advance action of this sort becomes necessary whenever it is felt that the natural progress of events will not lead to the kind of future that is considered desirable - when it is realised that active intervention will be needed if unwanted outcomes are to be avoided and desired ones produced. The future thus constitutes a fundamental element of the realm in which planning takes place. Over and above the particular substantive areas in which they are engaged, all planners experience the future as part of the ground in which they operate, as a dimension of the environment to which their actions must be directively correlated.

Although the traditional social science disciplines seem to have been slow in appreciating the need to address themselves to the future, both from the point of view of engaging in social forecasting on a scale comparable to that of technological forecasting and from the point of view of designing and promoting possible societal futures, this tardiness has, in part, been compensated for by the remarkable development of futurology as a new domain of interest. Largely because of the speed with which it has appeared on the scene, but also perhaps, on account of its apparent disrespect for some of the traditional methodological canons of the empirical sciences,

futurology and its practitioners are still regarded with some curiosity and suspicion. It is, nevertheless, well into the process of becoming institutionalised:

There is a comprehensive literature dealing with the issues of prediction, long-range forecasting, and 'inventing the future'. A variety of conferences and publications can be enumerated. There are plans for futures institutions, lookout institutions, and so on. It can be said that in most industrial countries the problem discussed is no longer the right of existence of futures research but rather the problem of its usefulness, its limits and its organisation. Futures research is not primarily a methodologically fashionable phenomenon; it is symptomatic of the stage of development we have reached today. (Lompe: 1968:48)

A stream of important contributions to the development of future studies in the earlier years of the decade culminated in a 'vintage' year in 1967. Erich Jantsch produced the 'bible' of technological forecasting, "Technological forecasting in perspective", and Bertrand de Jouvenel, his influential book, "The art of conjecture". It was also the year in which Kahn and Wiener's massive study, "The year 2000: a framework for speculation on the next 33 years" appeared, and the work of the Commission on the Year 2000, "Toward the Year 2000" was published in Daedalus.<sup>3</sup>

Of the institutions specialising in futures research, Washington's Resources for the Future, Inc., established in 1952 with the co-operation of the Ford Foundation, was one of the earliest. Others to appear since then include the World Resources Inventory under the guidance and inspiration of Buckminster Fuller and John McHale, established in 1963; The

Social Sciences Research Council's Committee on the Next Thirty Years in London; de Jouvenel's Futuribles organisation in Paris (1967); the Institute for Futures Research in Berlin, headed by Robert Jungk; and the Commission on the Year 2000, already referred to, which was chaired by Daniel Bell. Two of the new institutions are now producing journals. The World Future Society, established in Washington in 1966, publishes "The Futurist: A newsletter for tomorrow's world", and the Institute for the Future, founded in 1968, with its headquarters in Middletown, Connecticut, publishes "Futures".

My present remarks on the future as an element of the planner's environment are not intended to contribute to this body of investigation either in the way of further forecasts, projections or scenarios, or by examining methodological problems of prediction, but they are influenced by the sorts of issues that futurology has raised, and more particularly by the new perspective on the future that it propounds.

Webber has suggested that the transition from pre-industrial to industrial, and the current transition from industrial to post-industrial society has been accompanied by a shift in societal conceptions of the future from a fatalistic to an extrapolative, and now to a 'teleological' attitude. For pre-industrial man, the future is likely to be outside his field of vision, and even more likely to be out of his control, so that there is a general tendency in the direction of fatalism with regard to the material future. Under industrialisation, the managerial shaping of institutions, forward scheduling of

production, the estimation of budgets and investment, population forecasting, and the development of actuarial skills in general, contributed to a conception of the future as being more or less like the past - a continuation of present trends, such that it was, at least, in part accessible to reason through processes of projection and extrapolation. Indeed, the entire market and credit system was premised on the assumption that the future would not depart at all radically from the present.

Post-industrialism is again revolutionising our concept of the future:

.....among the consequences of the knowledge explosion is the emergence of a new way of thinking about the future. That conception is the derivative of our new capacities for prediction, our new images of our powers for controlling future events and, hence, a new outlook suggesting that, to a considerable degree, maybe we really can invent the future.

If we can characterise a single distinguishing difference between the outlooks of the industrial age and of the post-industrial age it is this: that industry and government in the recent past had to respond to change after the fact: in the post-industrial age they will be intellectually equipped to respond before. That is to say, that the coming style for confronting the future will be forecasting and planning.

(Webber: 1968:180-181)

The future is now being seen to depart drastically from the present, but we are developing powerful new response capabilities that will permit us more directly to seek to design the future, rather than accepting it fatalistically, or trying to predict and merely accommodate to change as best we can.

The widespread internalisation of this 'teleological' concept of the future is an enabling condition for the parts of the social field to adapt actively to the world they live in on a large scale. As I have noted in discussing the concept of adaptation, this requires that purposeful systems be able to incorporate some image of the future, in the form of desired outcomes or focal conditions, into their present state. In understanding the causal strands that connect purposeful behaviours with future states of the system that they comprise, it must be appreciated that the openness of systems refers not only to the spatial distribution of their parts, but also to their temporal distribution - the 'incompleteness' of an open system has a processual as well as a structural dimension. A living system is not to be considered simply as a spatial conglomeration but also as a temporal spread in which the degree of autonomous and heteronomous regulation, and the degree of 'openness' or 'badness' of the system gestalt may fluctuate over time. One of the attributes of consciousness is that it makes possible the anticipation of future system states, which is an essential preliminary to the prevention of dysfunction and the creation of more benign system states and of higher levels of adaptation.

A given social ecology is an existential phenomenon - a veridical texture of objects, events and situations with which any planning system must interact in the present. The 'distinctive competence' of an empirical sociology is its ability to describe and interpret these complex patterns of human and social interaction. The special status of planning

activity lies in the fact that it is not addressed directly to this contemporaneous reality, but to a perceived hiatus between the existing state of affairs and an image, or 'wishful projection' of a state of affairs that is considered, on certain criteria, to be more desirable. More correctly, planning is a response to a perceived disparity between a state of affairs that is believed will exist if nothing is done, and the desired future. Planning is not usually considered necessary if it is expected that the forces operating in the present will, of themselves, bring about a future that is considered desirable. As I have already noted, the gap between socially desirable futures, and conditions which can be expected to occur if nothing is done, is likely to be greatly enlarged under the impact of turbulence.

It is essentially this future orientation that makes planning one of the most difficult intellectual activities in which men can engage. The future is an entirely hypothetical realm. Certain possibilities and probabilities can be produced by forecasters and futurologists, in a similar way that historians and archaeologists can offer us probabilistic accounts of the past, but there is nothing in the vast edifice of scientific knowledge that lends conviction to our anticipations of what is to come. This fundamental uncertainty of the future, combined with our dismally limited understanding of the dynamics of social existence, conspire to plague the planner's world with continuous and immense challenges to his problem-solving capabilities, and helps to account for the modesty of much that is achieved.

The future becomes an integral part of the behavioural environment to the extent that it is transposed to, and incorporated, in the present. In fact, as I have suggested, the planner attempts to transpose two future into his present; a realistic and a wishful projection of the future state of the system. The former corresponds to what can be expected to occur 'naturally', and the latter to the desired future.

Our skills in constructing realistic projections have been increasing enormously over the past two decades, and their significance is gaining recognition in the establishment of specialised institutions, the emergence of expertise and professionalism, and the body of literature that is expanding at a phenomenal rate. As one would expect, a far greater level of competence has been attained in the forecasting of the gross quantitative changes that can be expected than in predicting the sort of qualitative changes in values, attitudes, beliefs and life styles that are likely, and upon which many of the quantitative changes are dependent. It is far easier to extrapolate from the present rates of car ownership to a figure for the year two thousand, than it is to judge whether a society will be prepared to ban private vehicles in cities and invest instead in large scale mass-transit systems.

A second major difficulty in societal forecasting derives from the pervasive uncertainty that adheres to a number of meta-problems which have a potential for totally altering the basic structural configurations upon which any methodology of prediction must be based. The concept of meta-problem has been put forward by Chevalier, who writes:

Society has come more and more to perceive and articulate a new kind of problem. It is not only a matter of putting related problems together: new knowledge and expectations have caused a fusion, an inter-relation of problems into a class of meta-problems. And society, once having perceived a meta-problem, begins also to perceive that courses of action to relieve it are inter-related. In fact some comprehensive attack is now the only strategy acceptable to society. (Chevalier, quoted by Emery and Trist: 1972:123)

For the 'global village', such problems as racial confrontation, the population explosion, nuclear diplomacy, and the violation of the ecosystem, have this quality, and unexpected developments in any such area could entirely vitiate most of our assiduously accumulated projections and forecasts in other spheres.

The basic difficulty in constructing realistic projections lies in determining some basis for identifying those phenomena in the present which are likely to have a determining influence over the shape of the future. The problems of constructing a wishful projection are, perhaps, equally great, but of a quite different sort. They relate primarily to the difficulties of choosing and designing objectives which will meet a very wide diversity of needs and aspirations. Before any wishful projection can be translated into programmes of action, some mechanism is needed for the reconciliation of multiple interests.

The problems associated with securing a sufficient degree of agreement concerning the objectives of action raise fundamental questions about the role of the planner and the degree to which

he should be involved in the processes of power and influence that in democratic societies, ultimately determine the implementation or abandonment of plans. The problems of the democratisation of planning will be discussed later. My immediate interest is in the future as environment, and, specifically, in the properties of objectives or desired outcomes as 'field forces' acting on the planning system in the present. One answer to the problem of how imagined future states of affairs, such as the objectives espoused by planners, enters into the contemporaneous behavioural environment, has been put forward by Lewin.

I have already had occasion to refer to his concept of 'contemporaneous causation' in discussing the meaning of the life space. He writes:

This thesis is a direct consequence of the principle that only what exists concretely can have effects. Since neither the past nor the future exists at the present moment it cannot have effects at the present. In representing the life space therefore we take into account only what is contemporary. (Lewin: 1936:34-5)

How then are we to explain the evidence of our senses that the possible outcomes of the things that we and others are doing now lie in the future, and yet that they do exert a constraint on the way we behave in the present?

The following consideration offers a solution to this dilemma. The goal as a psychological fact undoubtedly lies in the present. It really exists at the moment and makes up an essential part of the momentary life space. On the other hand the 'content' of the goal...lies as a physical or social fact in the future. Indeed it may not occur at all. The nature of the expectation and the character of what is expected, in so far as they act as

psychological conditions at the moment, naturally do not depend upon whether or not the event comes to pass. In either case the person strives toward a goal which exists psychologically in the present life space...

...Nevertheless, the content is in no way irrelevant, but is of greatest importance for psychological dynamics. Whether, for instance, an actual goal refers to a present or a future event, whether this event is thought of as something that definitely exists, or is something that is only possible or highly probable - all this forms an essential characteristic of a goal.  
(Lewin: 1936:37-8)

A great deal of confusion and misdirected effort has occurred, both in psychology, and sociology from the inability to see goals as relations between systems and certain parts of their environments, and the tendency instead to reify them, conceiving them as 'things' which can be striven for and attained once and for all. The goal-seeking behaviours of rats have been taken as the paradigm of rational behaviour. Studies of motivation and of organisational behaviour, in particular, have been handicapped by the concept of the 'purpose-ridden' system, that has had to be invented to do justice to the notion of goals as things:

The purpose-ridden man's only 'rational' activity is to seek goals: but since each goal is attained once for all, it disappears on attainment, leaving him 'purposeless' and incapable of rational activity unless and until he finds another. 'Satisfaction' is impossible to purpose-ridden man or at least forms no part of his rational activity. He is allowed only a momentary 'relief from tension'.

(Vickers: 1965:32-3)

In contrast to this concept, Vickers proposes that the main energies in purposeful behaviour are, in fact, taken up with establishing and maintaining relationships, which he calls 'norm-holding', with various parts of the environment.

The goals we seek are changes in our relations or in our opportunities for relating; but the bulk of our activity consists in the 'relating' itself. To explain all human behaviour in terms of 'goal-seeking', though good enough for the behaviour of hungry rats in mazes, raises insoluble pseudo-conflicts between means and ends...and leave the most important aspects of our activities, the ongoing maintenance of our ongoing activities and their satisfactions, hanging in the air as a psychological anomaly called 'action done for its own sake'.

(Vickers: 1965:33)

Conceptualising planning as a process of anticipatory decision-making which includes the setting of objectives requires that the relevant environment for planning includes various aspects or dimensions of the future. Their psychological potency (not their actual 'content') is brought into the present as temporal gestalten which overlap the 'real' present and which enter into the contemporaneous determination of behaviours. The special significance of the future in the environment of planners cannot be appreciated, therefore, if the future is simply regarded as the focus of planning goals, which like battlefield targets can be defined in various ways and 'fired at' from various angles and distances. Planning's concern is with acting in the present so as to ensure that our social systems will be able to relate to future environments so as to enhance (or at least to maintain) the present effectiveness of our purposive behaviours. The planner's task is conceiving and designing alternative possible relationships among the parts of the social field and the non-social environment, based on an understanding of the dangers and the opportunities in the future that can, with foresight, be avoided or exploited.

The difficulties of working out in advance the ways in which present organisational arrangements (which are themselves constantly changing) can effectively relate themselves to future states of the environment (which can rarely be adequately known) are subject to some variation, according to the velocity at which the future is seen to be approaching, and to the degrees of certainty or uncertainty that attach to the anticipations and conjectures constructed. In the first place, when it is believed that the future is, to a degree, 'knowable', variances believed to be latent in the future which are relevant to the effectiveness of the system may be perceived as more or less immediate or distant - as urgent, or as no cause for any immediate concern or action. The perceived distance of relevant aspects of the future is, of course, closely bound up with the speed with which the future is seen to be approaching.

I am aware of the dangers of 'misplaced concreteness', but there does seem to be some phenomenological basis for ascribing to the future certain heteronomous properties, and particularly its own dynamic. The uneven development of societies means that futures are being created in relatively limited and isolated spaces, at the vanguard of technological and social innovation. Some aspects of the life styles into which we can expect to be moving are already present in our midst, or, as Jungk has put it, "Tomorrow is already here." (Jungk: 1954). This is reflected in the now widespread appreciation that the discontinuity between science fiction and 'science fact' has been steadily eroded, to the point that we can often no longer be sure that even the more incredible postulates of science

fiction are not the objects of systematic laboratory exploration somewhere in the world. For large parts of the social field, out of touch with the cutting edge of technical innovation, the "discovery" of many of the advances that have already been achieved has the effect of telescoping their expectations and delivering the future into the present.

It is equally true, of course, that in the same sense pockets of the past survive in the present, and it is a characteristic of our times to want to slow down the rate at which the past recedes by diligently preserving and amplifying its material manifestations and our powers of recollection. Planning's concern must be with the rate of arrival of the future, and the creation of roles and institutions that are sufficiently responsive and adaptable to cope with the scale of change that is coming. The titles of a number of recent publications are indicative of a growing awareness that we now stand in some danger of being overtaken by the future: "The unprepared society: planning for a precarious future", (Michael: 1968), "Future Shock", (Tofler: 1970), "The Urgent Future", (Mayer: 1967), "The Temporary Society", (Bennis and Slater: 1968), "The Age of Discontinuity", (Drucker: 1968). Such a list could be very considerably extended.

The scope for a more positive approach to the unfolding of the future seems to lie in the extent to which we are able to impress our own fate upon it, in planning and programming our activities at a pace that takes account of men's finite adaptive capabilities, and corresponds to a rate of learning attainable

over an extended social field. In this regard, some distinctions, such as those proposed by Vickers (1965) and Ackoff (1970a) between goals, objectives and ideals, may be indispensable:

Goals are objectives whose attainment is desired by a specified time within the period covered by the plan... Objectives may be unattainable within the planning period, but they must be approachable within it... Goals must be attainable within the planning period, but need not necessarily be attained. An objective which can never be attained but which can be approached without limit is called an ideal.  
(Ackoff: 1970a:23-4)

Ordering the aspirations of an individual or a social system into categories of this sort has the effect of imposing a morphology on the future which offers a system of reference points for the mounting of effort and a criterion for discriminating the order in which different courses of action need to be undertaken.

The frequently-made distinction between tactical and strategic planning can perform a similar function as an ordering device for partitioning the relevant future to make possible some separation of planning tasks and appropriate allocation of resources. Ackoff has pointed out that the distinction between tactical and strategic planning is relative rather than absolute, and is, in fact, three-dimensional. In any particular planning operation, these dimensions are the time span over which it has effects and the difficulty of reversal; the scope of the plan, or the number of functions and activities affected by it; and the extent to which it is concerned with the selection of means as opposed to the selection of objectives (Ackoff: 1970a:4-5).

A related aspect of developments and events that are thought to lie in the future is the degree to which they are foreseeable.<sup>4</sup> Because a behavioural system and its field correspond to a dimensional domain in space and time, one consequence of anticipation and expectation is to extend the system's relevant environment into the future. It is then possible for the overall structure of probabilities associated with the emergence of favourable and unfavourable sets of circumstances in the future to be interpreted in the classification of environmental causal textures that are used to describe the geo-behavioural environment:

1. As a theoretical limiting case, we can envisage situations in which the future is regarded as entirely irrelevant, when it is felt for example, that 'nothing could happen which would make any difference'. For individuals, this corresponds to the condition of living entirely for the present, a state that may be associated either with pure despair (as sometimes with reaction to a bereavement), or with pure hedonism. The locus of significance with regard to what might happen in the future is felt to lie entirely within the individual ( $L_{11}$ ).

The sense in which this constitutes a limiting case is quite evident. There is usually bound to be some event of potential significance to the individual, with a probability of occurrence that injects at least a minimal degree of relevance into the future prospect, and of course there is no meaning to a concept of 'life' that restricts its

significance entirely to the present. Perhaps the closest we mortals may approach to a future without relevance is in the apprehension of imminent death. On one interpretation, at least, it is profound human distaste for such a contemplation that has inspired doctrines of immortality.

In real life, social collectivities and organisations are even less likely to see their futures in such terms. One of the well-known synergistic effects of group experience is to make confrontations with the unknown tolerable, in a way that an individual cannot usually achieve by his resources alone.

Nevertheless, to the extent that groups and organisations, as well as individuals, find no relevance to themselves in the future, it is improbable that any planning or other purposeful activity will be undertaken.

2. At the next level, some significant variability is believed to lie in the future, but significance is ascribed only to those variations which it is believed will emanate from the system itself. ( $L_{11}$  and  $L_{12}$  relations are relevant). When this is the case, knowledge of the future is likely to be characterised by a feeling of certainty - all the significant things that are going to happen will be the result of what the system itself does, or the development of processes already latent in the system or its environment. In an environment which is clustered but still placid, the clustering itself offers no threats or promises for the

future which cannot be apprehended in the present. If this were not so, we would be considering a higher level of causal texturing.

Certainty about the nature and the location of environmental relevancies which are yet to happen, can, of course, be only relative and never an absolute quality. In this context I am referring to certainty relative to the degrees of uncertainty and ignorance that are descriptive of the more complex levels, and in contrast to the limiting case of irrelevance, when all possible relevancies are randomised.

This level seems to correspond to the environments that are relevant in the medical prognosis of some of the simpler diseases. Diagnosis of the symptoms allows an accurate prediction of the career of the illness to be made and enables the physician to act with a degree of commitment in the application of a remedy. In organised social systems routinisation is the pervasive mechanism whereby a degree of certainty is imposed on the future, the classic case being that of bureaucracy, as described by Weber. The essence of bureaucracy is predictability, and the safeguard of predictability is routinisation - the reduction of behaviour to repetitive cycles of action, carefully programmed and controlled. Thus the Director of Education in Napoleon's France could look at his watch and tell what subject every child in every French school was studying. For children at school and workers in factories the shape of the future tends to a high degree to be mapped out, and to justify feelings of certainty with respect to its unfolding.

With regard to those aspects of the future about which we can be certain, we can carry out commitment planning, of which routinisation itself is one of the commonest tools. When activities are continuously programmed and repetitive, forward scheduling of production and estimates of budgets can be carried out with a high degree of exactitude. Clearly it is not environments of this type that pose the real problems for planning. If community planners have any opportunity to operate in such favourable circumstances, it is in the planning of new towns and new communities where they have extensive control from the beginning, and not the more typical circumstances under which they operate in the established city and the metropolis. It is in environments of this amount of predictability that an 'optimising' philosophy of planning is most likely to be successful.

3. The next step brings me to futures whose dominant characteristic is uncertainty. These are futures in which it is understood that important variances may occur, which originate in changes happening in other parts of the field with which the system is linked in some way. In other words, the planner has to confront the probability of relevant changes occurring in the future as a result of the behaviours of others. The possible future behaviours of parts of the field to which the system is directly linked, and with which it has some established relations can usually be inferred or intuited from a knowledge of their past behaviours and an understanding of their structural and other relevant properties. This means that futures,

although they cannot be approached with certainty, can be approached probabilistically or 'stochastically'. The important difference from the previous levels is that  $(L_{21})$  relations now enter into future determination, in addition to  $(L_{11})$  and  $(L_{12})$ .

Environments of which our knowledge is uncertain provide an essential part of the settings for such institutionalised activities as insurance, gambling, and competitive sport. The provision of insurance and the rates of premium attached to it is directly related to the discernable probabilities of certain events happening in the future, and is only required insofar as some threats to system maintenance or development can be anticipated. Similarly with gambling. When outcomes in a game of chance are certain, everyone could be expected to gamble, but there would be no-one willing to take their bets; in situations in which we are quite ignorant about outcomes, it is unlikely that anyone would want to gamble. Competitive sport loses much of its appeal when one side has such an overwhelming superiority that the result is a foregone conclusion, or when we can have no expectations about the achievement of a result.<sup>5</sup>

The kind of planning required in environments of this sort is contingency planning. Of this sort of planning Ackoff writes:

Contingency planning is old hat in the military but is relatively rare in business. In planning for a military invasion, for example, consideration is always given to each possible outcome of an operation and plans are made for each. Military planners

do not wait to see what happens before planning what to do about it. They try to cover every possibility in advance, because time is 'of the essence' once a possibility has become a reality.  
(Ackoff: 1970a:17)

Contingency planning involves the maintenance of a level of preparedness with respect to developments thought possible or likely and a readiness to shift resources or change direction so as to be able to avoid or exploit new situations as they occur. Uncertainty of this order is descriptive of the typical planning environments of business enterprises in industrial society and of battlefield planning in warfare restricted to what are now known as 'conventional' weapons. It corresponds also to the sorts of environment confronting planners in established communities, in which significant uncertainty is created by the existence of other formal organisations and interest groups charting their own preferred courses into the future.

4. The fourth level corresponds with the dynamics of the turbulent field. In relation to the predictability of the future, the essential novelty for planning at this level is having to face the fact that sources of relevant variability can be expected to lie outside the set of relations about which the system has at least 'probabilistic' knowledge and an adequate set of prognostic skills. In other words, the relation of the system to its future is, in critical respects, one of ignorance - there is no apparent way of telling what might happen. As I have argued earlier, this corresponds to the state of affairs in which the 'ground' or

the field within which the connected systems are acting itself takes on dynamic properties. Systems of relations that lie entirely within the environment become determinative of the survival of individual systems and the character of the interactions that take place. Ignorance is thus equated with the high salience of ( $L_{22}$ ) relations in determining the shape of the future.

Ignorance of the future has quite different implications to a conception of the future as irrelevant, because it suggests that what ought to be known is not, and possibly cannot be known. I have argued throughout (adducing support from a number of different sources) that this level of unpredictability is becoming more typical in the rapidly changing social fields of those societies which are moving towards post-industrialism. For the city planner, this order of unpredictability has become pervasive with the onset over the past few decades of the 'metropolitan crisis'. The present distresses and disorders in many of the largest urban conglomerations deserve the name crisis partly because planners have not been able to cope with such a degree of unpredictability within the system as a whole. It is in conjunction with such fields that Ackoff recognised the need for an 'adaptivising' philosophy of planning, and has advocated responsiveness planning for corporations:

Such planning is directed toward designing an organization and a system for managing it that can quickly detect deviations from the expected and respond to them effectively. Hence, responsiveness planning consists of building responsiveness and flexibility into an organisation.  
(Ackoff: 1970a:17)

5. For the sake of completeness, but at some risk of 'over-intuiting' I suggest that insofar as the future takes on a vortical appearance then it again becomes irrelevant to the system. The feeling that one is entirely at the mercy of what is to come, tends to make any concern for its actual content and course of development superfluous. The ascription of irrelevance in this case, however, derives from the sensation that the forces shaping the relevant future are entirely heteronomous, and beyond any possible intervention by the system itself that would make any difference. The ( $L_{22}$ ) relations are perceived as entirely determinative of the future states that will affect the system. At the first level I considered, the future states of the system are felt to be subject only to autonomous determination - everything outside the system itself being irrelevant to its future (i.e. only ( $L_{11}$ ) relations are relevant).

Naturally the 'real' futures that we confront as individuals and those that are faced by institutions and organisations are complicated mixtures of these abstracted models. Much of the future will continue to lie beyond our capacities to influence it; other parts of it we can expect to be able to invent and plan. Some of its aspects we shall always have to approach with the attitude of the gambler. In his illuminating conjectures on 'planning beyond the industrial age', Webber writes:

Our continuing intellectual problem will be to know when it is more useful to view the future deterministically, when it is best to view it stochastically (and hence as

indeterminate), and when we can profitably view it teleologically. That question is likely to take on the character of an intellectual dilemma. In a setting of rapid technological and social change, the possibilities for 'accurate' prediction would seem to decline. But with improving predictive theory, we should also be able more sensitively to anticipate coming changes. And with increasing organisational capacities for large-scale decision and action, we should be able deliberately to shape more of the future than was once possible. No formula is available for resolving these competing views. It may be that the conceptual, methodological and governmental issues that surround these images will continue to occupy us as we are carried along into the coming decades. (Webber: 1968:182-3)

#### Planning: The Active Adaptations of Purposeful Systems

Planning has been described as a means whereby aggregates can adapt themselves to changing environmental circumstances when these become characterised by certain degrees of uncertainty and unpredictability. It is a process of anticipatory decision-making which is directed to the production of future states of affairs that are considered to be desirable, but which could not be expected to occur naturally, without active intervention. In environments that are relatively unchanging, or when it is felt that existing states of affairs could not be improved upon, it is unlikely that planning activity will become prevalent.

In order to test the usefulness of the systems concepts developed in the first part for gaining a better understanding of planning, it is now necessary to consider more closely what is to be understood by that term. In conformity with the

contextualist thought-mode this will be done by amplifying the connotations of planning rather than trying to specify its meaning definitionally. Planning is to be understood initially as a particular form of human and social activity - a purposive human activity that is directed towards influencing the future state of some system of ideas, actions, events, objects. It becomes necessary to show in what ways it is a distinctive form of activity - how planning behaviour differs from other forms of behaviour, and what kinds of effects it has in society.

In its most general sense, planning is a ubiquitous activity, in that all deliberate actions, to some extent, take account of the value implications of choice, consider the opportunity cost of alternatives foregone and attempt to relate means to ends according to some criterion of 'efficiency'. These steps are not necessarily taken self-consciously, and it is possible, of course, for plans to be conceived which have no possibility of ever being translated into action. The prisoner's deliberations over the perfect escape, day-dreamers spinning images of their paradise on earth, and the gambler optimistically planning his orgy of consumption would be examples. When I speak of the planning that is carried out by armies, corporations, town planners and the like, I mean to imply more than idle conjecture. Planning in this context implies the design not only of a desired future but also of effective ways of bringing it about. These 'realistic' or feasible plans differ from those of the day-dreamer to the extent that they attempt not only to define the objectives of planning, but also to enumerate the appropriate means - resources and courses of action which are

both available and which are calculated to be effective in bringing about the desired objectives. The differences between effective planning and day-dreaming seem to be differences of degree rather than differences of kind. When the best laid plans of men do not fulfil expectations, it is often because the required means prove to be unobtainable (funds, information, expertise, public support) or because they prove to be less effective than the plan had anticipated. (The advertising campaign for Ford's Edsel would be a classic example).

A further distinguishing characteristic is that planning is required only when the decision-maker is confronted with a set of decisions that are too large to handle all at once and that cannot be divided into independent subsets. This is one of the central elements of the definition of planning put forward by Ackoff:

Planning is required when the future state that we desire involves a set of interdependent decisions; that is, a system of decisions. A set of decisions forms a system if the effect of each decision in the set on the relevant outcome depends on at least one other decision in the set. Some of the decisions in the set may be complex, others simple. But the principal complexity in planning derives from the inter-relatedness of the decisions rather than from the decisions themselves.  
(Ackoff: 1970a:2-3)

To the extent that a set of decisions can be handled all at once, or can be broken down into subsets that can be handled separately, it constitutes a decision-making or programming situation, and not a planning situation. When the set is too large to handle all at once, it must be divided into a series of stages which are dealt with sequentially, or partitioned among a

number of decision-making bodies that can work 'in parallel'. The difference between planning and simple decision-making is, therefore, a difference of degree. Planning embraces a more or less complex system of decisions, in which present decisions are made in the light of those already taken and earlier decisions are constantly reviewed in the light of new requirements.

Planning is purposeful, involving the choice of appropriate means as well as the choice of goals and objectives. For a system to be able to choose a desired future and to be able to modify it when circumstances change it must have the properties of a purposeful system. It must be able to reconsider and modify its objectives under constant environmental conditions, and to go on pursuing a particular end within certain limits of environmental variation. Functional and goal-directed systems, lacking these capabilities, are unable to use planning as an adaptive mechanism. Machines may help human planners, but they cannot replace them.

Individuals and the institutional structures which they comprise do have the capacity to plan. At a societal level, one can usually identify a collection of government departments, statutory authorities, and other large formal organisations that have responsibility for the development of particular regions or development of limited facets of societal resources such as manpower, technology, transportation, trade, agriculture, health, and the like. Similarly, within cities responsibility for the provision and the enhancement of resources, amenities and opportunities for the citizens is usually functionally

divided among a considerable number of specialised agencies. The extent to which the planning responsibilities of these various agencies are subordinated to one overall planning authority naturally varies immensely from society to society, and from city to city.

Purposefulness, as opposed to merely goal-directed behaviour, is a critical capability of such agencies because of their need to adapt to an uncertain and changing environment. This may mean sustaining a particular organisational effort in spite of a radically altered situation, or reformulating the organisational mission at a time when the social context is relatively unchanging. It is, however, perhaps more typical to observe organisations reconsidering their goals only in response to some manifest dysfunction or crisis.<sup>6</sup>

The significance of purposiveness to planning activity may be made more evident by considering a nonpurposeful mode of 'planning', which, as one might expect, is typically better known for its failures than its successes. We can think of it as 'target planning' and it is essentially a goal-directed activity.

It begins with the formulation of a comprehensive and systematic specification of the state of affairs that is to be aimed at - the target - and prescribing the time schedule for attaining this goal. Thus in many of the five-year or ten-year development plans for under-developed societies, the goals are set once and for all at the commencement of the planning period. Similarly

with the galaxies of Master Plans that have been drawn up to guide the progress of communities. Civic authorities in many parts of the world have optimistically sought to improve the common good through the construction of comprehensive land-use and transportation maps which purport to describe the state of the community at the end of a 15 or 20 year period of 'planned development'.

The reasons for the failure of such development plans and Master Plans to reach fruition are not, of course, always simple, but in many respects they seem to derive principally from the adoption of inflexible objectives which cannot take account of events and situations emerging during the planning period which challenge the feasibility of the original targets. It may often be the case in practice that 'plans' of this sort are not intended to be realistic in their promises, but are designed to serve shorter run political ends.

To describe planning as a process of active adaptation is a corollary to the proposition that a planner must be at least a purposeful system. Planning is more than simply reacting to changes in the environment (passive adaptation), or responding to changed circumstances in either the system itself or in the environment (directive correlation); it involves active interventions that will create the starting conditions for further adaptive behaviours. As I have shown, the process of active adaptation embraces a connected series of directive correlations in which the earlier system actions and the outcomes that they produce constitute successive steps towards

the realisation of objectives. We tend to speak of planning when such sequences of directly correlated behaviours are deliberately structured at the outset in order to increase the probability that the desired outcome(s) will be produced (i.e. things are not left to chance); and the effectiveness with which it is produced.

In such planned sequences it is usually possible to identify a number of constituent parts of the planning process itself. Ackoff, for example, has identified five such parts: the setting of objectives, the determination of means (courses of action, practices, procedures, programmes and policies), the acquisition of resources, the design of implementation procedures, and of a feedback or control system for evaluating performance. (Ackoff: 1970a:6). Thus, to take an Australian example, the National Capital Development Commission upon assuming responsibility for the planning of Canberra, the Australian capital, in 1958, announced as its immediate tasks:

- "1. To survey problems and needs and fix both short term and long term objectives.
2. To produce a revised town plan.
3. To establish the resources available, both government and private enterprise, and the roles for each.
4. To prepare a programme which relates what needs to be done to the instruments, physical resources and funds available.
5. To make the programme work."

(NCDC Annual Report: 1958)

Such parts of the planning process are not to be thought of as essential or invariant stages in a linear causal train, commencing with the unambiguous specification of goals and concluding with the selection and implementation of the 'best' course of action for achieving them, but are better understood as constituting a system in themselves. As such they are in interaction with one another throughout the planning activity, each subject to variations in the impact they have at each stage on the total process. As the relations between those parts themselves may be quite complex and unstable, it is usually necessary for planning itself to be planned.

A man lighting a fire in order to be able to cook is an instance of purposefulness and active adaptation. The present area of interest, however, is limited to those deliberate actions which are directed towards the state of large-scale social systems - society and its major sub-systems - and is not particularly concerned with the active adaptations of individuals.

Friedman, in referring to this kind of activity as 'social action', directs attention to planning as a socio-cultural force, as well as an activity that needs to be understood on the bio-psychological level (Friedman: 1969). Societal action is inevitably tied up with the distribution of such field forces as power, knowledge, values and material resources within the social field as a whole, and is therefore unavoidably concerned with its operative political and ideological systems. It therefore tends to reflect and to perpetuate the prevailing zeitgeist even though this may seldom be a conscious aim.

The importance of this link tends to be revealed only at those times when the zeitgeist is abandoned in favour of expediency or efficiency, and the needs stemming from peoples' cultural roots are overlooked. Much of the criticism of modern functionalist architecture, for example, draws attention to its cultural superficiality. The mountains of glass-covered steel boxes taking root in central business districts all over the world and the global uniformity of airport lounges and cafeterias contribute to the emergence of a universal style and form at the expense of cultural distinctiveness. More generally, the cultural specificity of the planned achievements of society are threatened by the emergence of a 'positivistic' approach in planning that aims to reduce it to a form of programming. Techniques in business planning developed in the United States, for example, are commonly packaged into a marketable form and exported to the rest of the world. Similar homogenising tendencies are apparent in metropolitan planning. The earlier experiences of the US with mass car ownership and the vast amounts of money spent there on traffic and transportation research give a special appeal to the solutions arrived at in the design of traffic systems, and they have consequently been imitated in other places. Inner city freeways continue to devour houses, and cloverleaf junctions hectares of valuable land, more in response to what are regarded as the universal requirements of the motor car than to more basic cultural values which are less readily apprehended and given expression.

With the great debate over planning versus individual freedom now generally resolved in favour of planning, it may be

necessary to caution that the success of planning has to be measured in terms of its capability to respond to, and elaborate the expression of, the spiritual values and cultural axioms of its historical period, as well as its ability to produce good 'technical' solutions to engineering problems (the 'technological fix').

To the extent that it takes account of cultural values and uncertain futures, planning is resistant to claims of special expertise in its practice and to the professionalisation of planning into an esoteric craft beyond the comprehension of its supposed beneficiaries. To the extent that the legitimation for societal action is sought in societal choice, planning has become, in part, a political activity, and the planner, like the social scientist, is under pressure to define and to defend his concept of the role he plays.

Difficulties of this sort are common to the whole range of occupations the resources of which necessarily include an element of applied behavioural science. Educationalists, penologists, management scientists, welfare officers and city planners share the difficulties that arise from the permeation of this subject-matter with social values, and in each case, the questions of what the basic aim of their activity is, and how it may best be served, represent significant and enduring problems. I suspect that where such aims as 'serving the public interest', 'rehabilitation', and 'increasing job satisfaction' can be agreed upon, this is precisely because they are too vague to allow the deduction of particular courses of action. Current

planning literature reveals widespread disagreement over whether the planner should be advocate or dictator, adviser or policy-maker, technical expert or involved humanist.

A further delimitation is that we are interested in those types of planning or societal action, which are dependent upon and make maximum use of scientific-technical intelligence.

Interventions in society that are premised upon religious conviction or traditional beliefs, or that are dependent upon the charismatic propositions of an individual, are of direct concern to the social scientist, but they fall outside the scope of the concept of planning to be considered here. Formally institutionalised planning is characteristically information-dependent to a very high degree, and could always use more information than is available at any particular time.

Planning that is based on scientific knowledge has the further characteristic that it espouses rational thought, discussion, and argument to the exclusion of extra-rational thought-modes such as intuition, wisdom, and tradition. More particularly, as Friedman has argued, planning's typical medium of exchange is a form of 'bounded rationality':<sup>7</sup>

This refers to the fact that thought and consequent action intended to be rational are contingent on environmental conditions - the social context of planning which represents the medium in and through which planning decisions are made.  
(Friedman: 1967:234)

In Friedman's schema, bounded rationality is contrasted with ideological and utopian thought, which he calls 'non-bounded rationality'. Ideological and utopian thought is at least

potentially rational in that its constructions can be logical and coherent, and they may be concrete representations of abstract social values such as equality, freedom and justice. There is clearly a place in planning for the productive use of utopian thinking, or the exercise of creative imagination. Martin Meyerson, for example, has called for a revival of utopian thinking to test new possibilities for city growth, and advocates the bringing together of the social utopianism of More and Owen and the physical utopianism of Lloyd Wright and Corbusier: (Meyerson: 1961).

Bounded rational thought is, in turn, dichotomised into functionally rational and substantially rational thought - thought which is rational with respect to the means only, and thought that is rational with respect to both the ends and the means of action. Both types of rationality can usually be found in the activities of planning systems. In the first case the 'ends' of the planning activity are assumed to be given, while substantially rational thought "... implies the possibility of altering the ends during the action as a result of changing circumstances or new information." (Friedman: 1967:236).

It is of interest to note the degree of correspondence between this classification of types of thinking and the Ackoff-Emery systems taxonomy discussed above.<sup>8</sup> Functional rationality and substantial rationality express the action potentials of goal-seeking and purposeful systems respectively; the former have choice only with respect to course of action or means, while the latter are able, in addition, to choose and to change



however, there is pressure towards improving upon mere feasibility as a criterion for action, and searching instead for the optimal solution, or at least the best among the courses of action that are deemed feasible. The potentiality of the system being planned for and the relevant environment to change over time promotes a third criterion for the actual formulation of planning decisions - adaptability. Insofar as the phenomena to which planning is related are subject to unpredictable and uncontrollable variations during the course of the implementation of the plan, the plan must incorporate some sensitivity to changes of this sort, and must be modifiable when the situation so demands. Here I follow Ackoff who has identified three 'philosophies of planning' that are related to the degree of emphasis given to each of these important criteria - feasibility, optimality and adaptability. These three planning philosophies are satisficing, optimising and adaptivising (Ackoff: 1970:6ff).

Satisficing planning simply aims to do 'well enough' in any situation, and reflects the 'art of the possible'. Limited aims are adopted which make no novel demands on the structure and capabilities of the planning system. The satisficer tends to use only that information which is readily available or can be acquired easily. The great attraction of satisficing is that it makes very moderate intellectual demands, and requires comparably limited resources. Aims are chosen which tend to exclude the need for subsequent revision (adaptability), and there is no attempt to optimise.

Optimising, on the other hand, searches for the best possible course of action in any situation, and for this reason is intellectually more challenging, and more likely to recognise the need for fairly constant review and correction during the implementation period. The optimiser needs far more information and spends considerable amounts of time and other resources searching for the information that is needed but which is not readily available. In fact, optimising planning tends to become dependent on information of a particular sort - that which yields to quantification and is therefore amenable to the mathematical techniques of optimisation.

Adaptivising (or 'innovative') planning is a relatively new concept, the development of which has been largely due to Ackoff. It is presented as the 'richest' of the three philosophies in the sense at least that it addresses itself not to a limited set of feasible aims, or to optimising the performance of those parts of the system which can be qualified, but to improving the adaptability of the whole system. It is the richest, too, in that it includes the possibility of moving towards the most feasible set of decisions, without necessarily placing a premium on optimality or pre-judging what is to be considered feasible. The most important single ingredient of the adaptivising philosophy is its premise that the actual process of planning is more important than the product; the way in which planning is organised and carried out, and the people who are involved in it, is more important than the plans that are produced:

... the process of planning is its most important product. The benefits of planning are derived more from participation in the process than from consuming its product. (Ackoff: 1970b:22)

Although it seems to be the case historically that planning has emerged as a prevalent mode of decision-making in connection with the shift from agricultural to industrial society and in those parts of social fields in which actors have had to meet disturbed-reactive types of environmental conditions, there is nothing about these new conditions which makes planning obligatory, or guarantees that it will be carried out effectively. In the first case, this is only to say that practically all of the problems in society that may be perceived in some sense as 'planning problems' can be expected, if ignored, to regulate themselves at some level of activity. Vickers, in his discussion of the Buchanan report on traffic in towns, considers the consequences of doing nothing about the traffic problem:

Traffic, outstripping road capacity, will generate self-magnifying traffic blocks in which no vehicle can move and through which it is impossible even to walk. This self-defeating situation will both prevent and deter flow of traffic; and when the blocks have been cleared, a reduced volume will move for a time in relative freedom, which will soon attract enough traffic to generate another jam. The volume of traffic will stabilise, oscillating about a mean at which it is just sufficient to deter what the roads cannot handle. (Vickers: 1965:2809)

The purpose of human intervention, as he points out, is to regulate such relationships at a level which is more acceptable to those concerned than that at which the inherent logic of the situation would otherwise provide.

In past historical periods (and today among some political conservatives) it has been widely believed that these tolerance limits are most effectively and fairly established by the operations of a market system in which each is equally free to buy and to sell, and a political system in which each is free to record his vote. In 19th century England, the organised restraint of laissez-faire was held to produce institutional structures that were robust and durable, representing the 'fit' elements that were able to survive the competitive machinations of the laws of supply and demand - the scarcely concealed 'hidden hand'. The steady and continuous increase in the amount of resources allocated to societal planning in both the developed and the developing countries has gone on alongside accumulating signs, some mundane and some spectacular, that the hidden hand is, in fact, highly fallible, and a growing awareness that the alternative to planning, at least in such contexts as the metropolis, may be no longer laissez-faire but 'laissez-mourir'.

Notwithstanding the judgement that the use of planning is very much on the increase, it is already a very widespread form of activity, and has developed its own professional bodies and 'invisible colleges', a substantial body of literature which includes a large number of journals, and a respectable standing in a very wide range of public and private institutional contexts. Moreover, it is not at all restricted to the developed societies in its impact, but has been one of the most significant 'social exports' to the Third World. Today's missionaries preach planning as one of the roads to national

salvation. Naturally, in circumstances where a regular daily meal for all has yet to be achieved, economic planning of one sort and another has taken precedence. Yet there are grounds (though these may be diminishing) for hoping that an earlier start on broader societal planning may permit the emerging African, Asian and Latin American societies to avoid at least some of the worst consequences of the relatively undisciplined industrialisation of the west.

Spectacular and compelling support for a larger scale of intervention in the functioning of society was forced upon those who, in this century, experienced the unexpected and unwanted turmoil and convulsions of the two world wars and the depression that intervened. The apparent heteronomy of the processes behind such massive breakdowns in social life created a climate that at least was not resistant to greater intervention and control, while the actual mobilisation of resources on a societal scale, both to fight the wars and to 'reconstruct' after the fighting and after the great depression, offered a powerful demonstration effect of what could be achieved by a mobilised society.

As the pace and scale of change have boomed over the last few decades, the belief appears to have grown that the avoidance of similar catastrophes is, in an important way, contingent upon our ability to anticipate, regulate, and, where possible to create, the changes that are going on. The media (and television in particular), have made global issues of race conflict, over-population, the ecological crisis, and so on, and

we appear to have no 'guiding fiction', equivalent to the 19th century belief in 'progress', which offers us even a pretended immunity from the traps that lie ahead. It would be facile for me to suggest that such immunity might now be found in planning. It would appear, however, that the application of scientific and technical intelligence to problems of the future and our means of arriving there is now commonly regarded as a more hopeful approach to the preservation and enhancement of our social worlds than the attitude of old-fashioned liberalism and a purely therapeutic approach to societal malfunctioning. The limited starts on preventive maintenance in industry and preventive medicine in the field of public health have to be generalised to society itself.

## NOTES TO CHAPTER V

- 1 The concept of appreciation comes from Vickers:  
"Appreciation manifests itself in the exercise through time of mutually related judgments of fact and value...such judgments disclose what can best be described as a set of readinesses to distinguish some aspects of the situation rather than others and to classify and value these in this way rather than in that. I will describe these readinesses as an appreciative system." (Vickers: 1965:67; see also Vickers: 1968).
- 2 See Jungk (1969) on the distinctions between logical, critical and creative imagination, and the special need for the latter.
- 3 See Winthrop (1968) for a more comprehensive review.
- 4 The discussions by Ackoff (1970a) and Webster (1968) of different types of knowledge of the future provide most of the concepts used in this section.
- 5 This has become the bane of cricket Test Matches for example!
- 6 Crozier (1964) has argued that in the traditional French bureaucratic structure, change occurs only with the crises that punctuate periods of routine.
- 7 This concept was, of course, introduced by March and Simon (1958). It has obvious correspondences with the viewpoint that open, behavioural systems can only be adequately understood if the properties of the environment and the nature of system-environment interdependancies are also understood.
- 8 Its value as a basis for further conceptualisations, however, is limited, due to the fact that the basic category of 'thought' or types of thinking is rather nebulous.

**CHAPTER VI**

**STRATEGIES FOR THE "SOCIOSPHERE"**

PLANNING'S EXPANDING HORIZONS: THE SOCIOSPHERE

In the developed societies we are accustomed to the fact that planning enters into a vast range of purposeful social activities, routine and innovatory. The waging of wars, the exploration of space, business activity, environmental control, the preparation of National Budgets, the administration of social welfare - for all such activities, planning - making decisions now that will affect the future state of affairs - has become indispensable. In refining the concept of planning I make here some preliminary distinctions according to the different substantive areas in which planning is habitually applied. That is to say, that I distinguish a number of broad types of system that are planned for:

Technological systems: human enterprises such as space exploration and the development of supersonic transport, the design and construction of huge dams and hydro-electric schemes. Sometimes the label of project planning is attached to planning of this sort, in which the critical problems are the piecing together of men, material and machinery to make a successful working system.<sup>1</sup> The intellectual resources for such activity are characteristically from mathematics and the natural sciences, engineering, etc. but are likely to include operations research, systems analysis and so on when the end product is a complex man-machine system requiring the integration of the technology with human capacities.

Natural systems: man's interventions in nature, intended to exploit, preserve, and augment the natural environment. Flood control, reclamation, conservation, resource planning, policy-making for minerals, agriculture, fisheries and the like all fall into this category. (With 'Departments of the Environment' springing from the ground like mushrooms after a thunderstorm it could be that our planning for natural systems will become far more systematic). The main intelligence called upon derives predominantly from the biological and geographical sciences - botony, ecology, oceanography, geology, meteorology, and the like. Planting deserts, ocean farming and weather control are some of the prospects for natural system planning.

Institutional systems: the institutional arrangements in society for serving men's physiological, psychological, spiritual and social needs, encompassing institutions for welfare, production, recreation, education, communication, health, etc. - organisational mechanisms deliberately structured for the creation, allocation and control of relatively scarce material and non-material resources. The critical tasks of institution building, maintenance and change involve organising the capabilities of an aggregate of individuals into a functioning whole, and the key resources for planning for institutional systems derive from the behavioural sciences - psychology, social psychology, sociology and their 'applied wings of industrial psychology, sensitivity training, psycho-therapy, corporate planning, management science, administrative science, etc.<sup>2</sup>

Economic systems: economic systems are referred to separately because of the special interest and expertise that has developed in civilised societies in relation to problems of the creation and allocation of those resources that are given a monetary value for the purposes of their exchange and distribution.

In planning for economic systems the concept of resources typically has a rather limited connotation which relates to man's material requirements to the relative exclusion of his appetites for beauty, peace, freedom and the like, or even clear air and water.

The 'routine preoccupations' of national economic planning - the maintenance of a high level of employment, the stabilisation of price levels, and the promotion of a favourable balance of payments, and of business economics - profits or profitability, abstract one dimension of the systems that they are applied to, and it is a dimension that has come to assume an overriding significance in the management of industrial society. Planning for economic systems draws its expertise from the various branches of economics - welfare economics, econometrics, accounting, etc. and the professional experience of banking, finance, trade and the like.

Conflict systems: it is seemingly inherent in the nature of the social world that particular forms of competition, fights and struggles are recurrent, so that both their occurrence and the way in which they unfold can be to some degree anticipated and thus prepared for. Planning for conflict systems, whether the

aim be to avoid, contain or achieve ascendance in the conflict has a characteristic expression at a number of different levels of social behaviour, but its formalisation has perhaps proceeded furthest in military planning and some aspects of business planning. Preventive planning for international conflicts incorporates defence strategy, diplomacy (including its expressions through foreign aid, trade and cultural arrangements), and the study of international relations. Among institutional systems, business and political conflict are the most salient and have their own characteristic ground rules and procedures, which are the planning intelligence of political parties and corporations.

The development of Game Theory is an attempt to generalise the dynamics of competitive situations through the investigation of conflicts in microcosm, although its real value for planning for conflict systems is not yet evident, conflicts at these differing levels naturally require for their negotiation expertise that is based upon knowledge and understanding of the possible and probable behaviours of the aggressor or competitor. Expertise of the first sort is generally consolidated into bodies of law, constitutions, and sets of rules.

Social systems: planning for large-scale social systems has been widely aspired to and discussed, but infrequently carried out. Much more has been achieved in the context of 'middle range' social systems - organisations and institutions, and limited aspects of them - economics and conflicts for example. However, planning for social systems per se, at the national,

regional and community levels is becoming more feasible, and more essential for societies moving into post industrialism. Along with the rapid expansion of other forms of technology, the technology of the social sciences, and its resources in scientists, methods, understandings and institutional arrangements for teaching and research has also been subject to escalation. To date, social planning has generally proceeded on limited fronts - demographic (birth control), health and welfare, educational, leisure and recreation - with relatively little co-ordination of these facets and often a low level of understanding of the relations among them.

Little can be claimed for a list such as this, and certainly it cannot be said that such categories are likely to be exhaustive of planning's concerns, or that they are mutually exclusive. It does imply that the future stages towards which planning activity has been geared have been thought of in systems terms, such that planning is understood as a process of improving the existing state of a system by guiding its change towards a more desirable state, as a process of making more systemic, or improving the coherence among an existing set of elements, or as a process of designing and bringing into being a completely new system. Thus improving the performance of a racing car entails successive adjustments to each of the engine's parts and the relations between them, in a search for a combination that will optimise speed without sacrificing endurance; the more adequate provision of adult or continuing education facilities may involve bringing into conscious and coherent relations a number of existing and fragmentary providers; planning for such

projects as the giant Aswan dam and the Apollo mission involves the creation of substantially new systems.

The complex institutional arrangements and systems of action that have become reliant on some sort of planning activity are not represented by any one of these types of systems, but rather represent the overlap and points of intersection of many of them. In the past even though the operation may have been thought of fundamentally as an economic system - one whose functions were defined in terms of profits or profitability it had to be viewed also as a technological and a social system, and planning had to try to reconcile the competing constraints of economics, engineering and psychology. The city is another example of a complete socio-environmental system within which a bewildering heterogeneity of functions have to be performed, aims have to be satisfied, and relations established and maintained. If corporations and communities are managed and planned for as if they have systematic properties, then it is necessary in spite of the complexity and variety of structures and actions that they encompass, that there be some image of them in systems terms. The origins and phases of city planning as a special form of activity can be related to changes in the image of the city as a distinctive entity in the minds firstly of reformers, and later of politicians and professional groups.

While planning has in its origins been divided according to its subject matters, giving rise to separate fields of planning and separate experts within them, there are now increasing signs that the best thinking about planning today is become oblivious

to disciplinary boundaries and special subject matters. This may be reflected in the decision of the American Institute of Planners to identify themselves primarily as planners, and to extend membership to those not specifically trained in traditional 'city planning', as the OECD's 'Bellagio Symposium' on long-range forecasting and planning, in which the dimensions of the coming style of planning are charted. The 'Bellagio Declaration' issued by the participants in this symposium begins with the following observation:

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. The time is passed when economic growth can be prompted without consideration of social consequences and when technology can be allowed to develop without consideration of the social prerequisites of change or the social consequences of such change.  
(Jantsch: 1969:7)

At the forefront of the planning literature there is an increasing concern for large-scale societal planning, or 'integrative' planning, which would have the effect of bringing into closer relations the segments into which planning endeavours are currently separated, both by conceptualising them individually as facets of a large scale system for which interventions in any one part has effects for all of the others, and by focussing on the activity of planning as such, as a generalised means for attaining a satisfactory level of societal regulation. Wentworth Eldredge, in outlining the need for

'total environmental planning' is a characteristic apostle of this concern:

The conservation, rehabilitation and development of both natural and man-made environment is a massive task, clearly calling for the up-grading of our planning technology, or resource allocation for agreed-on goals, from a micro- to a macro-scale level in three specific ways to match the ever-growing increase in the socio-economic complexity and extent of the rapidly expanding American scene. Specifically, considerations of (1) area, (2) function and (3) time are all too limited in our planning capabilities. (Eldredge: 1967:1158)

It seems most likely that such identified areas as corporate, defence, regional, city, economic and social planning will retain their identity but most probable that they will also become increasingly salient as parts of each other's planning environments in a wider definition of the realm in which planning takes place. Some of the groundwork in preparing the necessary intelligence for this more comprehensive scale of societal intervention has been undertaken in the studies on 'social intelligence' by Raymond Bauer, Bertram Gross and others (Bauer: 1966, Gross: 1969).

The need for such development is one that is being forced upon us by the changing pace and scale in the environment that we inhabit:

Our present revolutionary waves differ not only in their quantitative aspects from those of the recent past, but also in their qualitative characteristics. Whereas in the 19th century we might have dealt conventionally with relatively separate revolutionary strands within their local geographical context, our present revolutions are now global in their spatial and quantitative aspects. Their quality is no longer that of isolable sequences of

events whose interrelations were more separated in time, in numbers of people, and in the social and physical processes affected.

Our present series of revolutionary transitions are more specifically characterised by their simultaneity - the swift interpenetration, increased feedback, and the interdependence of one group of changes upon another.

Global in scale, potentially affecting the physical balance of all life on the planet itself, and reaching into every aspect of individual human life and society, our ongoing change patterns now constitute an ecological revolution.

(McHale: 1969:63)

McHale advocates a conceptual extension towards a 'planetary ecology' which assumes that 'its prior concern is with the maintenance of the planetary society'.

One of the consequences of the drift towards post-industrialism is that many of the terms and tools of planners have become obsolete and inadequate to the dimensions of the task. The thoughtways of industrial society are no longer helpful in confronting the planning problems of extended social fields in which turbulent systems of interaction and interdependency mean that the basic units are ecological in character.

This, as I have noted earlier, becomes a prevailing condition in social fields undergoing transformation from Type III to Type IV environments. Planning for social fields requires that they be treated as fields, and not simply as collections of systems performing different functions, with different structures and sizes, such that each system can be planned for in isolation from the others and the overall context that they share. It

therefore requires ecological concepts and understandings that will encompass populations of systems and their environments, and show ways in which these can be modified and governed as ecological units.

To re-conceptualise the relevant domain of planning on this planetary scale raises more forcibly than has previously been so those kinds of problems which Churchman has identified as problems of the 'ethics of large-scale systems'. The central difficulty is that of finding criteria of 'rational conduct' with regard to intervention in one part of the whole system when its effects upon the state of the whole system can never be adequately grasped. As Churchman himself puts it:

".... there is no such thing as improving a part of the system without taking into account what happens to the whole system as a consequence".

(Churchman: 1968b:70)

Before exploring possibilities for a 'science of the ethics of the whole system', we need some concept of the dimensions of the 'whole system' that we are to concern ourselves with, and it is towards such a concept that the following discussion is directed.

If systems theory is to be of real value in comprehending the expanded ecological realm of planning, then what is needed in systems theory is a set of concepts that go beyond the system-environment dichotomisation, which emphasises their structural differentiation, to describe the 'system plus environment' as a unit, emphasising their essential continuity in terms of process. Lewin's concept of life-space, and his

equation  $b = f(p \cdot e)$  - behaviour is a function of the person plus his environment, accomplishes this for the psychological individual, but the problem has been more systematically treated by Angyal in his discussion of life, not as an intra-organismic happening, but as a process which takes place between organism and environment. I referred in the last chapter to his concept of the biosphere. In introducing this concept he writes:

...The life process does not take place only within the body surface, but involves a much broader realm of events. Such a broad definition of biological happenings is unconventional but necessary in order that justice be done to the problems of the total personality. The broadened concept of life does not refer to an intra-organismic happening, but to a process which covers a much broader field than the body. Life involves both intrasomatic and extrasomatic happenings. The limits of life extend as far as the organism is able to exert an influence on the events in the world...

Accordingly I propose to call the realm in which the biological total process takes place the 'biosphere' that is, the realm or sphere of life.

(Angyal: 1941:99-100)

He rejects attempts to distinguish between the organism and the environment in structural or morphological terms as un-productive, if not impossible, and argues that the subject matter of the sciences of life is primarily processes and not structures. This being so, it is more appropriate to distinguish between organism and environment in dynamic terms and to examine the processes of life in terms of the extent to which they are determined by the system or organism itself or by heteronomous, environmental forces.

We cannot tell whether a structure belongs to the organism or to the environment, but we can determine to what extent a process is respectively organismically or environmentally governed.

Those factors which are prevalently under autonomous government constitute the organism or self or subject, while the factors which are prevalently under heteronomous government form the objectives of the environment.

(Angyal: 1941:95;102)

The biosphere therefore is not an amorphous domain but is differentiated in the dimension of autonomous versus heteronomous determination between the subject and the object poles. No biological process is determined entirely organismically or entirely environmentally, but is a resultant of both kinds of forces. These may be expressed in the ratio (a:h), the ratio of autonomous and heteronomous government. The limits of the opposing poles of the biosphere thus correspond to pure organism (processes governed entirely autonomously - the subject pole) and pure environment (processes governed entirely heteronomously - the object pole) neither of which refer to real phenomena, but which have the status of theoretical limiting cases.

The relative values of a and h...are very different in the various biological manifestations. For example, the processes going on in the gastrointestinal tract are, on the one hand, heteronomous, environmentally determined through the physical chemical properties of the food, but on the other hand, they are also autonomous, organismically determined: mechanical work of the stomach and intestines, secretion of the digestive glands. In the biological process taking place in the blood, the external determinations play a smaller role and internal determinations a larger role than in the processes of digestion.

(Angyal: 1941:94-5)

An analogous term for describing and interpreting the realm or sphere in which social life takes place has been suggested by Boulding - the "socosphere". He writes:

The social system consists of all human beings on the planet and all their interrelationships, such as kinship, friendship, hostility, status, exchange, money flows, conversation, information outputs and inputs, and so on. It includes likewise the contents of every person's mind and the physical surroundings, both natural and artificial, to which he relates. This social system clings to the surface of the earth so that it may appropriately be called the sociosphere, even though small fragments of it are now going out into space. (Boulding: 1966:3)

As Angyal uses the concept of the biosphere to overstep the structural dichotomization of the organism and the environment, so the concept of the sociosphere points beyond the separate consideration of the structures and properties of social aggregates, and of their environments, to a way of understanding social activities entirely as processes which take place between such aggregates and their environments in which the shape and direction of the activity is jointly governed by the properties of the behaving systems and by the properties of the environment.

For the biologists, the image of the existential form of the organism as a dynamic one, expressed in the precept 'the organism is a process' occasioned a fairly radical re-orientation of the focus of their investigations but also a certain amount of confusion and disagreement. In sociology, the analogous point of view states that 'a social system is a structuring of events or happenings rather than of physical parts and it therefore has no structure apart from its functioning' (Katz and Kahn: 1966:31). This image too demands a re-orientation from the prevailing organismic and mechanistic

conceptions of the social structure, towards a new conception of it as a system of action, interaction, exchange, process, and so on - a dynamic complex in which structure is "immanent" rather than transcendental, being constantly refashioned, destroyed and elaborated in every sequence of social interaction.

To view the subject matter of the sciences of behaviour as processes rather than structures is a necessary consequence of conceptualising the entities with which they deal as open systems whose capacity for survival, for performing their functions, and for growth is a direct function of their ability to incorporate free energy from the environment in a constant exchange process. The processes of exchange themselves and not the particular morphological characteristics or substantive appearance of the system are the phenomena to be understood. I am inclined to say therefore that discussions concerning where we should draw the boundaries of an organisation for example, are no more fruitful than arguments over where one might locate the boundaries of the organism.

In this regard Etzioni has suggested that we distinguish between participants and non-participants according to whether the individual achieves a high rating on at least one of the following criteria: the nature and intensity of the actor's involvement in the organisation; the degree to which he is subordinated to organisational powers, and the amount of performance required of him by the organisation. "Thus students, inmates, soldiers, workers and many others are included. Customers and clients on the other hand, who score

low on all three criteria, are considered "outsiders" (Etzioni: 1961:21). March and Simon have taken a broader view: "When we describe the chief participants of most business organisations, we generally limit our attention to the following five major classes: Employees, investors, suppliers, distributors and consumers." (March and Simon: 1958:89). Of themselves, such deliberations are relatively sterile, and need to be geared to the investigation of specific systems of action before they are of any practical significance.

The consequences of adapting Boulding's concept of the sociosphere to my conceptual scheme become clear. The sociosphere is the region, or "dimensional domain" (Angyal) in which social activity goes on. Like the biosphere, it can be roughly differentiated into two fields, corresponding to the ratio of autonomous and heteronomous determination of the events it encloses. Towards the subject pole, events in the sociosphere are predominantly under autonomous government, or system-determined; towards the object pole they are predominantly under heteronomous government, or environmentally determined.

This derivation may be clarified in the following quotation from Angyal in which terms appropriated to the sociosphere replace the specifically biospheric terms:

The differentiation of the (sociosphere) into subject and object is the basic organisation of the (sociosphere) and forms the foundation for further structuralisations. The single factors have no fixed position in the (sociosphere). Processes which, at a given moment, stand prevalently under environmental government

may at the next moment come under prevalently (system) government. Strictly speaking, one cannot generalise and state to what extent a given type of (social activity) is (systematically) or environmentally governed. The exact value of this ratio can be determined only in specific instances. There is, in other words, a continuous flux between the two poles of the (sociosphere).

(Angyal: 1941:102)

In making this conceptual transposition, full account must of course be taken of the qualitative differences between the organism or the individual, and the social group or social aggregates as centres of autonomous government and of the related differences between the substantive forms of environmental determination in the biosphere and the sociosphere. Nevertheless there are substantial continuities between the two concepts which have some important methodological consequences. Primarily, they are contextual categories, and in emphasising the dominance of process over structure they refer back directly to the root metaphor of the historical event or act. In investigating and interpreting the relevant parts of the universe, this implies that understanding is sought in terms of field determination rather than the discovery of linear casual trains and functional relationships - in fact that understanding and not explanation becomes the aim of research itself. This is discussed by Angyal in terms of the difference between relations and systems:

Dealing with relations and dealing with systems involve two different logical manipulations to which two psychologically quite different processes may correspond...Relational thinking aims at the establishment of the direct connection between two objects. For instance, in the study of casuation one has to find for member A (effect) a second member B (cause) with which it is necessarily connected. In

causal research the task is to single out from a multiplicity of data, pairs of facts between which there is a necessary connection. In system thinking the task is not to find direct relations between two members but to find the superordinate system in which they are connected or to define the positional value of members relative to the superordinate system.

(Angyal: 1941:254)

The directions and the outcomes of social actions are shaped both by the properties of the social actors, and the properties of the relevant environments - psychological, technological, natural - in which social life is carried on. This basis differentiation of the sociosphere into subject and object poles - the regions of autonomous and heteronomous government of social behaviours - leads to further structuralisations. The subject pole corresponds to the loci of purposeful social behaviours in the social field - the modal points in the mesh of field forces and interdependencies at which social relations are sufficiently organised and enduring to give them an identifiable form or structure. The sociosphere as a whole incorporates not only articulated social aggregates and their interrelations, but also the natural physical environment of the surface of the earth (the biosphere in conventional terminology), the technological environment that man has created on this same surface, and the symbolic-cultural environment that derives from the properties of man as psychological individual. This object pole of the sociosphere, the domain of the heteronomous determination, has not been subject to the same systematic attention as has the subject pole.

### The Subject Role of the Sociosphere

In a sense the subject pole of the sociosphere may be thought of as the social field itself, because it is the existence and the properties of the field as a whole that makes possible the degrees of system government over sociosphere occurrences. We are more accustomed however to thinking of the various types of social aggregates within the field as the actual source of government - the family and the kinship organisation, the informal group, community organisation, nation and so on, the varieties of social units that are frequently presented as the 'elements of the social structure' in beginning courses of sociology.

Distinctions are drawn among these units according to such criteria as their size, duration, cohesion, complexity, and the activity they carry out. I am not concerned here with elaborating such distinctions, but only with exemplifying the 'subjects' of the sociosphere. Social aggregates belong to the region of autonomous government in the sociosphere. Their characteristic 'cultures', the internal structuring of their parts into a division of labour, structures of authority and control, their characteristic climates, and so on - create ways in which occurrences in the sociosphere can be regulated and controlled, and sometimes designed through systemic functioning.

From this point of view of carrying out planned interventions in the social field, some of the differences among the various forms of social organisation that are maintained within it are

far more important than others. One set of distinctions which is fruitful in this regard, and which is particularly consonant with the systems approach is based on the concepts of geneity and nodality (Ackoff and Emery: 1972:13.35ff). The distinction between homogeneous and heterogeneous organisation that derives from the concept of geneity has already been alluded to. Geneity refers to the relations between a system and its parts. The homogeneous organisation is one which has greater control over its members than they have over it - the members function so as to serve the organisation's objectives. The heterogeneous organisation is one whose members have greater control over it than it has over them - the organisation exists to further the objectives of its members.

I have argued that the individual psychological system, man, is a purposeful system. Man can exhibit different behaviours and produce different outcomes under constant environmental conditions, and he can exhibit identical behaviours and produce the same outcome under varying environmental conditions. In a homogeneous organisation a large number of men are required to limit their possible behaviours to those which are calculated to co-produce the objectives of the organisation. Their possible range of responses must therefore be constrained in some way. In various circumstances this may be achieved by coercion, persuasion, the manipulation of incentives, the voluntary compliance of individuals in support of the organisational 'ideology', and so on. The essential point is that for a group of men to effectively pursue the objectives of the larger system of which they are part, the potential variance in their

purposeful behaviours has to be reduced. Organisational control refers to the characteristic ways in which human behaviour in organisations is limited and rendered sufficiently predictable for their separate functions to be consistently connected within a functional division of labour. With respect to the behaviours of their members therefore, homogeneous organisations are variety decreasing.

While homogeneous organisations use their members as instruments, heterogeneous organisations are used by their members as instruments (A definition and discussion of the concept of 'instrument' is given in Chapter II). For an organisation to function so as to increase the possible courses of action and expand the range of outcomes available to its individual members (the function of instrumentality), it must be responsive to their will, and not impose its own objectives upon them.

In order to serve the ends of its individual members such organisations have to be aware at every stage of what these ends are. This type of awareness has typically been sought through such mechanisms as the market place, the ballot-box, censuses and surveys, the actual participation of members in decision-making, and the like. When an organisation functions as the instrument of individuals, enabling them to do things through belonging to the organisation that they would not otherwise be able to do, the organisation is variety increasing with respect to members behaviours. A community is usually thought of as an organisation of this type.

The relationship of instrumentality entails a difference in system level between the actor and the instrument. For an individual or a social group to use an object, a person, or a group as an instrument in the production of desired outcomes necessitates that the 'used' entity function at a lower level of system behaviour than the user. Because individuals and social systems have the property of purposiveness, for them to be used as instruments implies either that their response patterns are downgraded to the level of goalseeking behaviours (or possible even functional behaviours), or that their 'user' functions as an ideal-seeker. In the latter case the purposiveness of individuals and groups need not be inhibited. Thus in the case of homogeneous organisations variety reduction generally corresponds to the restriction of members' behaviours to the goal seeking level. A social system is variety increasing when it allows its members to function at the level of purposeful or ideal-seeking behaviour. Examples of organised systems which tend to be predominantly homogeneous in character are corporations, prisons, army units and ships. On the other hand political parties, universities, clubs, cities, and communities are predominantly heterogeneous.

Nodality refers to the way in which authority is distributed.

A uninodal organisation has a hierarchically structured authority pyramid capped by a system part which functions as an ultimate decision-maker, which also, as a consequence, carries the final responsibility for what the organisation does. This part is able to resolve disputes among decision-makers at any lower level. A multinodal organisation has no such ultimate

decision-maker, and therefore in making decisions about the system as a whole requires a certain level of agreement between two or more relatively autonomous decision-makers.

	UNINODAL	MULTINODAL
HOMOGENOUS	: corporation; army; : prison; ship	: multi-national : corporation; : coalition govern- : ment
HETEROGENEOUS	: clubs; professional : associations; political : party	: university; : employers and trade : union associations; : city and community

An Empirical Classification of Organisational Types

Homogeneous organisations: a number of critical problems focus on the organisational requisite for obtaining and maintaining the participation of members and a sufficient level of involvement by them for the organisation to achieve its objectives. Either the members must be coerced in some way, or there must be a favourable balance of rewards to induce them to stay. The use of coercive means for obtaining participation is generally unstable in the long run, and with the progress of industrialism has given way to the manipulation of monetary and psychological rewards, as advocated for example by the Scientific Management and the Human Relations Schools respectively.

Etzioni has classified organisations according to the dominant mode of 'compliance', where compliance refers to 'a relationship consisting of the power employed by superiors to control subordinates and the orientation of the subordinates to this

power (Etzioni: 1961:xv). The three kinds of power are coercive, remunerative and normative, and the three kinds of involvement are alienative, calculative and moral.

Cross-classification gives nine cells, of which three corresponds to the conforming types: coercive-alienative (Coercive organisations); remunerative-calculative (Utilitarian organisations); and normative-moral (Normative organisations).

He suggests that each of the non-conforming types will experience a strain towards one of those in which power and involvement are commensurate. In homogeneous organisations other than those based on coercion, members have to be compensated for the reduction of variety in their behaviour. Etzioni's typology is useful in drawing attention to a number of the issues involved for organisations in managing compliance.

Planning for a homogeneous system involves identifying a set of goals for the system which are compatible with the state of its environment, and with which the goals of the individual members can be reconciled.

Heterogeneous organisations: a number of critical problems for heterogeneous organisations relate to the mechanisms by means of which the members can make their goals known, and to the adequacy of organisational resources for helping them to achieve these goals once they are known. Demands for the 'democratization' of universities, workplaces, professional associations, schools and a host of other institutional domains have become more pervasive and more persistent during the last two decades or so, and there is currently a great deal of

experimentation going on in all kinds of institutional mechanisms such as the ballot-box and the laws of supply and demand. Various strategies for consultation, participation, and 'power to the people' has emerged.

A related difficulty that is also characteristic of heterogeneous organisations concerns the tendency of those responsible for the day-to-day running of the organisation to subvert its actual *raison d'être* by formulating and defending goals for the organisation itself which conflict with its ability to serve its members interests (Blau and Scott: 1963:45-67). In this regard the conception of the organisation as a resource (or instrument) is quite critical. So long as the organisation remains a resource for the benefit of its members it can be variety increasing. As soon as it attempts to use its members as resources for its own ends it become variety reducing.

Planning for a heterogeneous system involves firstly that the needs and goals of the individual members be known. These goals must be reconciled amongst themselves, and with the constraint of being part of a system in a particular environment.

Uninodal organisations: The problematic consequences of uninodality for the organisation relate on the one hand to the quality of the ultimate decision-maker, and on the other hand to the ability of the membership in some respects to keep this decision-maker under control. This latter problem is of course

especially relevant to heterogeneous uninodal organisations.

The key consequence for planning is that the institutional leader in general has to be in agreement with planning decisions that affect the state of the organisation as a whole.

Multinodal organisations: In organisations that are characterised by a multi-centred allocation of authority many of the key problems are to do with the reconciliation of the judgements and the aspirations of the various relatively autonomous decision-makers. In order for things to get done and for the organisation as a whole to fulfil its mission some mechanisms for resolving disputes have to be developed. There has to be some agreement both concerning the relevant 'courts of appeal' (precedent, constitution, seniority, etc.) and the appropriate means for working towards solutions (bargaining, compromise, arbitration, etc.). Planning for a heterogeneous system requires a minimal level of shared understanding of, and commitment to the plan amongst the independent decision-makers.

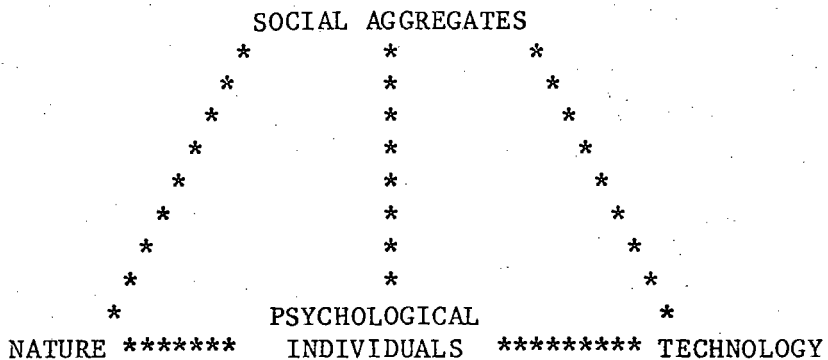
#### The Object Role of the Sociosphere

As I have indicated in commenting upon the neglect of the environment in the behavioural sciences, as a region deserving study in its own right, the object pole of the sociosphere - the region of environmental determination, is less well understood and we are conceptually less well equipped to describe it.<sup>3</sup>

One path towards further structural separations in this domain is suggested in the identification and analysis of Jantsch of

what he has called the nature-man-society-technology system (Jantsch: 1969). The manner adopted here of conceptualising these dimensions and of interpreting the relations among them differs, however, from that pursued by Jantsch.

We may think of purposeful social activities, which are to social scientists the most significant types of occurrences in the sociosphere, as being shaped and directed by the properties of four main structural elements - the social field (social aggregates), the natural universe, technology, and psychological individuals. From these we have identified social aggregates with the subject poles of the sociosphere, which means that for courses of action originating within the social field the psychological properties of man, and the properties of nature and technology represent the principal sources of heteronomous government and environmental influence.



In this context 'nature' is intended to connote the natural material universe in contrast to the man-made, 'artificial' environment. It embraces such phenomena as climate and topography, flora and fauna - geographic and biological phenomena in general. It may be thought of as incorporating

the other major 'spheres' that men have identified in the universe - the atmosphere, the lithosphere, the hydrosphere, and in its conventional meaning, the biosphere. Man is thus inherently part of nature as the species *homo sapiens*.

Technology is conceived as a dimension that has been progressively added to the sociosphere since the dawn of civilisation, referring therefore to the man-made environment of artifacts, machinery, buildings and so on. Its status is ambiguous, because while it appears fundamentally as a tool of man for controlling and reshaping the natural universe - in a sense an extension of man, it has also achieved a certain independence, and presents itself in some respects as an autonomous realm of development. From the point of view of many actions in the social field at least, it has achieved independence from both man and nature, with which in a sense, it has come to compete (Ellul: 1964).

While the psychological properties of man enter into the texture of the social field and the determination of its global properties, the individual nevertheless remains in an important way distinct from the field, as a part of it which is free to locomote and choose its own lines of action. Social aggregates have to confront and adapt to the unique characteristics of men as psychological individuals, in much the same way that they have to adapt to certain phenomena of nature and the technological environment. Man as individual is the primary locus of psychological activity which is based on the ability to symbolise. It is in particular the psychological properties of

man, but also of course his biochemical properties, that exist as constraints or supports for social activities, and can therefore be thought of as belonging to the realm of heteronomous government of social behaviour.

The schema implies that the persistence of a social aggregate entails that it become connected in certain ways with each of these other elementary dimensions of the sociosphere. Social activity occurs in a realm that may be differentiated conceptually into three major spheres - a natural 'physical-organic' environment, a technological or man-made environment, and a psychological or symbolic-cultural environment.

Characteristics of nature, technology and man may equally influence the nature of occurrences in the sociosphere, and thus constitute sources of heteronomous government from the point of view of the purposes pursued in social aggregates. At a mundane level, climate and topography limit and dispose the types of social activity that are engaged in as surely as the pattern of roads and buildings. The psychological constraints and demands that characterise the individual, his needs for support, achievement, and so on give rise to structural prerequisites for modes of social organisation.

In the present context the connections between social aggregates and these three other spheres are of the most significance, but these connections themselves are bound to be affected by the three other types of relations that this schema draws attention to: man-nature, man-technology, and nature technology. I have shown that while individual human beings belong to the subject

pole of the sociosphere in terms of their inclusion in the social aggregates which are the locus of social activities, there is also a sense in which some of the properties of man as an individual can constitute boundary conditions for social activities. We may note in particular, that in his relations with the other dimensions of the sociosphere man has the capacity both to become estranged from them or to idealise them. Insofar as the feelings an individual has and the ideas he propogates reflect his enstrangement or alienation from the world, or his idealisation of certain components of it, he may come to affect the quality of the aggregate experience in which he shares.

Mans alienation from society - the loss of social identity and of a sense of purpose - is a common theme amongst writers and philosophers, as well as social scientists, and has been captured in the concept of anomie. The idealisation of society on the one hand is expressed in social utopianism, and Jesuitical notions of the relative values of nature and nurture. Alienation from nature is held by some to be the typical state of the city-dweller (despite his attempts periodically to remedy this by 'going bush'), and consists in an estrangement from the land and the organic world in general. The idealisation of nature on the other hand is perhaps most commonly associated with the ideas of Rousseau, agrarianism, and such images as the 'noble savage'. Finally, alienation from technology has been a very pervasive theme from Marx to Marcuse, and is associated with such ideas as the separation of man from the means of production, the 'disenchantment of the universe', and the

crushing of the human spirit. The idealisation of technology appears just now to have a limited life expectation, but it seems to have been an essential ingredient in the 19th century adulation of 'progress', and is perpetuated by a breed of people whom it is currently conventional to denigrate as 'technocrats'. The significance of the nature-technology relation I discuss below.

Returning now to the interdependencies between social aggregates and the three major spheres of heteronomous determination, it is apparent that these relations may or may not be subject to conscious deliberation and purposeful structuring in the course of social activities. On the one hand, many of the purposeful activities which are necessary to maintain and elaborate the social field require that certain sociospheric relations be consciously organised and carefully controlled, while on the other many aspects of these relations remain unorganised and diffuse.

There are for example, systems of action in which the social field and the individual are deliberately brought into systematic relations. The ancient institution of the school is perhaps the exemplary case, insofar as education is concerned with the deliberative transmission of culture, but family socialisation and the various institutions for 're-socialisation'<sup>4</sup> have the same character. On the other hand it is perhaps more common for the individual and the social structure to come into contact and impinge upon one another without self-consciousness. The bulk of behaviour and its

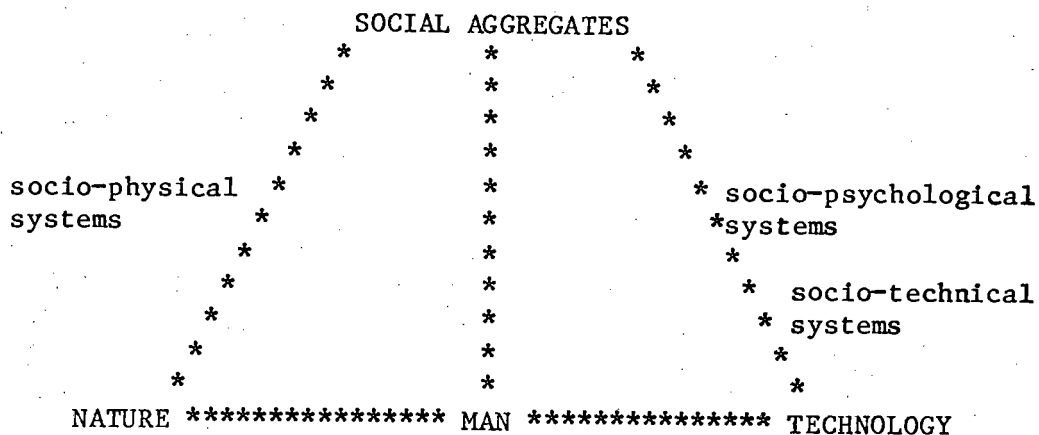
consequences belong to the area of non-specific, casual, or spontaneous occurrences being guided possibly by some deep-lying assumptions, but not consciously organised.<sup>5</sup>

Again, with regard to the relations between social aggregates and nature there is a considerable variation in the degree of specificity and purposiveness with which the natural world is taken into account. In many circumstances, dimensions of the natural world such as time and space, diurnal and seasonal variations, topography, sexuality and territoriality, exist principally as the setting or context of social life and are not themselves subject to purposeful manipulation or exploitation. Other social actions on the other hand involve organised and controlled relations with nature to a far greater degree. The archetype here seems to be agriculture, standing in contrast between a nomadic life and the permanent occupation and development of a natural site in the form of a settlement. As I will argue later, the progression of technology has had the effect of successively reducing the salience of the nature-society nexus.

Finally the interdependence of the social field and technology present a rather different case, because technology is entirely an 'artificial' creation of man, and we tend to assume at least, that its very existence is a reflection of deliberation and purposiveness. There is nevertheless a significant area of social life in which technology has the character of context, or an extension of the natural setting rather than an integrated part of an organised social-technological complex. Thus for

example the city can be considered as man's technological habitat - a human ant-hill in which nature has been very extensively subordinated by the artificial environment. Everyday pursuit of social activities entails contacts with technical constructions and experiences with technology in such activities as communication and transportation, that correspond to the 'non-specific' confrontations of men and the social structure. These relatively haphazard meeting places of technology and society stand in considerable contrast to the various types of deliberately organised and controlled interactions of men with machinery and instruments that are typically known as production organisations.

Those relations between social systems and the other elementary dimensions of the sociosphere which are deliberately structured and controlled for the purposes of attaining particular social ends may be conceptualised in terms of three pure types of socio-environmental system: Socio-physical systems, socio-technical systems, and socio-psychological systems. These are 'pure' types in the obvious sense that the real environments of social systems are invariably a mixture of them. The typology is therefore based on the existence in any system of social action of a set of relations - with nature, technology, or man - that are dominant in terms of the functions of the system, and not necessarily exclusive.



Socio-technical and socio-psychological systems have been identified and discussed in the literature. They are to be thought of here in rather broader terms as corresponding to the social system-technology, and social system-individual interfaces. The socio-technical system concept was developed initially from a series of investigations of coal-mining conducted by the Tavistock Institute in London, to draw attention to the fundamental interdependence of the social and the technological systems in production systems (Trist and Bamforth: 1951; Trist et al: 1963).<sup>6</sup> In the process of systematically applying the concept of open system in the investigation of enterprises, Emery and Trist write as follows:

The technological component has been found to play a key mediating role and hence it follows that the open system concept must be referred to the socio-technical system, not simply to the social system of an enterprise. It might be justifiable to exclude the technological component from the system concept if it were true, as many writers imply, that it plays only a passive and intermittent role. However, it cannot be dismissed as simply a set of limits that exert an influence at the initial stage of building an enterprise and only at such subsequent times as these limits are over-stepped. There is, on the contrary, an almost constant accommodation of stresses arising from changes in the external environment; the technological component not only sets limits upon what can be done, but

also in the process of accommodation creates demand that must be reflected in the internal organisation and ends of an enterprise. Study of a productive system therefore requires detailed attention to both the technological and the social components.

(Emery and Trist: 1960:86-7)

Subsequent application of essentially the same conceptual framework in the investigation of institutions whose main purpose is the processing of people rather than things, suggested that it is not primarily the nature of the technology, or the physical apparatus of such institutions that constitutes the critical boundary condition, but the unique and the common characteristics of the individuals that are to be acted upon.

Thus in describing his research in a prison, Emery writes:

The key to the difference would seem to be in the obvious and indisputable fact that one is primarily concerned with things, the other with human beings. The prison achieves its institutional ends only by doing certain things with and to its inmates. It must therefore give primary consideration to the psychological properties of the inmates, because these make some measures effective and others non-effective. These common psychological properties constitute the key boundary conditions of the prison - they are an essential part of the prison and yet they must, in large measure, be treated as a 'given' i.e., as existing and obeying laws and influences that are independent of the wishes or prison administrations...Basically, the prison is one of the class of socio-psychological institutions. It differs from hospitals - medical and mental - and from religious, educational and political institutions in that it is based on the premise of doing something against the wishes of its inmates, and usually against their interests.

(Emery: 1970:2)

The third type of socio-environmental system, the socio-physical system, corresponds to organised interrelations between social systems and the natural organic environment - institutional



The process of industrialisation is characterised by technology becoming the 'leading part' and tending to dominate the system of relations in the sociosphere as a whole. The 'reification' of technology and the ascription to it of an autonomous status may be a human mistake, but there is no doubt of the tremendous power of technology to refashion the shape of the world, and of our present relative ignorance of its impact upon sociospheric relations. A corollary to this is that socio-technical systems come to assume the dominant position in industrial societies.

One of the most critical consequences of the relative ascendancy of technology as has been suggested, is the attenuation of the direct link between society and nature, the social field and the organic environment, that has a far more prominent place in pre-industrial societies. The mechanisation of agriculture for example has the effect that the set of relations between society and the organic world that are designed to satisfy the food requirements of a population are increasingly mediated through technology, such that we become more inclined to think of agriculture as simply another industry.

The other central consequence of this imbalance is that technology and nature, which have previously had a relatively indirect relation to one another, mediated through man and society, are now brought into a direct relation - one which we have come to know as the ecological crisis. The significance of this has come to be appreciated by a number of ecologists who are urging and attempting to create a new social consciousness of the fundamental importance of the way in which society

relates to its natural environment, with the goal of re-establishing a direct link between society and technology.

### Some Implications for Societal Planning

This interpretation points to the usefulness of the concept of the sociosphere for thinking about planning. If planning is viewed as a form of human activity designed to enhance the adaptive capabilities and possibilities of individuals and the institutions they comprise, then the concept of the sociosphere embraces comprehensively the realm in which planning takes place.

First of all, to think of the sociosphere as the realm in which planning takes place, suggests that planning itself has to do with activities and processes, rather than objects and structures. As we shall see, many of the more recent and more useful concepts of planning now stress its significance as process rather than a product - as a process furthermore that aims to enlarge and improve the range of activities and outcomes available to purposeful individuals and groups.

It suggests also that the deliberate interventions of men in the universe ought to be guided by some image of the balance in which its main components stand to one another - an image of the overall system of interdependencies between man, nature, technology, and society (Bateson: 1973). The inference to be made from this is that from the point of view of the fitness of the sociosphere as a whole, the development of any one of these

four sub-systems must be directly correlated with the states of the other sub-systems. Insofar as planning is directed towards altering existing relations or effecting changes in the sociosphere, it needs to be highly sensitive to the possible consequences of intervention in any particular domain for the interdependencies among the main components and the state of the whole system. It does not seem possible in any actual instances of large-scale change that the existing social structure, the psychological state of an individual, the technological system, or the natural environment can be acted upon and 'improved' in isolation from changes in some of the other elements.

Experimentation in the social sciences which has tried to isolate the effects of these different sorts of elements, both in natural and laboratory settings, has been more distinguished by its failures than by its success. To the extent that they jointly enter into the systems of activity to which planning is directed, planning must seek their joint optimisation.

While it is possible for the choice of immediate courses of action to be guided by an image of some necessary balance in the sociosphere, practical constraints to do with the amounts of time, money and other resources available, and the sheer limitations of human cognitive abilities, dictate that actual courses of action tend to be limited to highly circumscribed facets of the totality, such as those I identified at the beginning of this chapter. In terms of the structural differentiation between the subject and the object poles it is apparent and to be expected that greater attention has been directed to the subject pole, in the design, transformation and

control of social systems, than to the object pole - the environment sphere. While principles and understandings to do with the 'engineering' and management of the dimensions of social environments - such phenomena as the ecosystem, man's technological habitat, and group and organisation 'climates' are becoming better understood, methods of directly influencing the structures and performances of social systems themselves attract more attention and have been far more extensively utilised.

## NOTES TO CHAPTER VI

- 1 See for example, Jungk's account of the World War II "Manhattan Project" (Jungk: 1960).
- 2 Dror sets out a compelling case for a more systematically organised area of "policy science" (Dror: 1968).
- 3 See Duncan (1964) for one exploration of the relations between social organisation and ecosystem.
4. See McKorkel and Korn (1962) and Brim and Wheeler (1966) on the concept of re-socialisation.
5. The "ethnographic" approach of Goffman and others has encroached into this neglected area of "taken-for-granted" behaviours. See especially Goffman's study of "Behaviour in public places" (Goffman: 1963).
6. See Kelly (1978) for a recent review of the socio-technical system concept.

**CHAPTER VII**

**URBAN STRATEGIES, SOME PROBLEMS**

Having now considered strategic activity in the abstract, as a mechanism within social fields for adapting actively in the face of a complex and uncertain future, and having spread this appreciation outwards in exploring the sociosphere as the realm in which strategists of all kinds are now being required to integrate and co-ordinate their efforts, I now turn to the substantive field of urban planning as an example of an area where the notion of appreciative management may be applied. The rationale for this is two-fold. Firstly this can be expected to enrich the understanding of the activity of planning by adding to the abstract investigation of planning as an adaptive mechanism for integrating and regulating the forces within, and impinging upon, social fields. This may be thought of as part of a contextualist mode of exposition (See Chapter 2), in which understanding of a particular kind of behaviour or process is sought both by 'shearing outwards' into its wider contexts, and by focussing inwards on particular expressions of it. This stands in contrast to definitional, classificatory, and typographical approaches, without however, denying their potential value.

Secondly, as has already been indicated, the quality of urban planning becomes an increasingly critical concern as a consequence of the world urbanization process, which means that for greater and greater proportions of people, the urban environment determines the quality of the lives that they lead. This is not to forget or to ignore the fundamental importance of the workplace in this regard, and thus to devalue the importance of corporate and institutional planning in general.

Nevertheless the continuing abbreviation of the working week, and the tendencies now to seek greater connections between the workplace and the community (and to make workplaces more like communities), accentuate the importance of creating 'communities' in the full traditional meaning of the term, and enhance the significance of the urban realm as a determinant of the 'quality of life' (Davis and Cherns: 1975).

Further than this, it is in the giant urban, industrialised regions of the sociosphere that the basic psychological, social, natural and technological forces are most imbalanced and vulnerable to quantum changes in their effects. As a machine for maintaining human life the city represents the most extensive and complete domination of the universe by structures that men have made themselves - an attenuation of the society-nature interdependence that is inadequately compensated by annual rushes to coast or mountains.

For the rest of this chapter then, I will develop a history of urban planning in order to contrast the definitional, classificatory and typographical approaches with that which may be possible, taking a more contextualist and appreciative approach.

### Urban Planning and Urban Planners - The Background<sup>1</sup>

It is only in the last 100 years or so that communities on the city and metropolitan scale have become predominant in industrial society, and it is only within this time that the

city as a whole has come to be taken as a unit for policy-making, reform, and planning. Even within this period it has nevertheless been more common for problems of urban living to be treated separately - housing conditions, poverty, open space provision, traffic and transportation, and so on, have typically been isolated under the administrative rubric of a special organisation or department, and treated as though solutions may be found to each of them independently of one another. Since the middle of the last century however, active intervention to improve urban conditions has been guided by a more and more comprehensive concept of the city.

It is within this period also that the combined effects of the industrial revolution and the greatly accelerated increase of population that it nurtured, began to seriously outstrip the capacity of the urban centres to sustain and enhance existing standards of living for the majority of the population.

Giedion has commented:

From 1870 onward, the great cities developed continuously toward what they are today - unserviceable instruments. No one knows when this tremendous waste of time and health will be stopped, when this pointless assault on human nerves will end, when this failure to achieve a dignified standard of life will be remedied.

(Giedion: 1967:778)

It is within this time therefore that city planning (as distinct from city design which can be credited with a much more ancient lineage) was recognised as a distinctive field of activity, in response to the gradual emergence of the kinds and scale of problems that have become characteristic of the modern metropolis.

The metropolis is a system much described and little understood. We know that it has emerged and this phenomenon appears as a phoenix-like birth from the ashes of the old city, which was a manageable and easily recognised political and social unit with fixed boundaries.  
(Dyckman: 1964:220)

In fact as Benevolo has recognised, a distinctive professional interest and competence in urban planning did not appear until some decades after this new pace and scale of urban development began to transform the fact of industrial society and 'metropolitanise' the city landscape:

The birth of modern town-planning did not coincide with the technical and economic movements which created and transformed the industrial town; it emerged later, when these changes began to be felt to this full extent and when they began to conflict, making some kind of corrective intervention inevitable.  
(Benevolo: xi:1967)

Many historical forces have shaped city planning from its earliest days - political, ideological, economic, social. Cherry suggests that the emergence of a comprehensive planning philosophy can be related in particular to two 'universal streams' - "The search for the ideal city in architectural terms, and the social idealism of utopia." (Cherry: 1969:12).

The first stream can be traced back to antiquity, and the first 'urban revolution' in the fertile crescent of the lands bordering the Nile, Euphrates, and Indus, where there is evidence of designed layouts. Five centuries B.C., the Greeks were building cities on a chequer-board layout, and a good deal of evidence of civic design from Roman times has been unearthed in England and other European countries. In the modern era the

tradition is kept alive by such endeavours as William Penn's plan for Philadelphia, the work of Nash and Wren in London, L'Enfant's Washington, and Burley Griffin's plan for Canberra, the Australian National Capital. This civic design tradition corresponds more readily with popular conceptions of the nature of city planning than the social reformist tradition, and is usually evaluated according to artistic and aesthetic criteria with which architects and landscape designers are more familiar.

The roots of the second stream - social utopianism - may if anything stretch even further back. Certainly the works of Plato and Aristotle have been an inspiration and model for much subsequent speculation on the perfectibility of man and the possibilities of social harmony, a tradition maintained by men such as Francis Bacon in his "New Atlantis" (1623), and James Harrington's "Oceana" (1656), and translated into practice in industrial societies in the design of model towns and villages. Of a number of community experiments in Britain in the 18th century, Robert Owen's New Lanark is perhaps the best known, while many other ideal factory-communities such as Titus Salt's Saltaire at Bradford, opened in 1853, George Cadbury's model community of Bournville (1895), and William Lever's profit-sharing industrial community of Port Sunlight (1890) were established during the 19th century.

In some respects it is in these model communities of the later part of the 19th century that the convergence of the two streams becomes most apparent. The big reformist movement in England during the 1830's and 1840's was largely concerned with the

deplorable conditions of urban living and the human inequalities in the towns and villages that had grown through industrialisation. The immense overcrowding and lack of sanitation that so seriously jeopardised health in the large towns, and the general deficiencies in housing and public utilities made it apparent that the true happiness of man was not to be found simply or directly in the transformation of his social institutions and organisations, but depended also on the radical improvement of his physical environment.

Self-consciousness about the city as a qualitatively novel living environment, and a conception of it as closely connected system of buildings, roads, activities, communications, begins with the reform movements in England and America in the middle of the 19th century, which had to address themselves to the hopeless interferences and confusions amongst these elements. While the aims of these movements are in general limited and remedial, they reveal embryonic conceptions of the city as a total environment and attempts to understand the inequities and pathologies within their populations in terms of the properties of this environment as a whole. Thus in Britain parliament initiated enquiries that lead to reports such as those of the Select Committee on the Health of Towns (1840) and the Royal Commission on the state of Large Towns (1840-45) which became the basis for reform legislation such as the Public Health Act of 1844 (Ashworth:1954). Gans comments that the Civic Reform movement got under way in America during the 1850's in response to a similar rapid and unregulated growth of urban areas which has resulted in the inadequate provision of utilities and

services, the accumulation of slums, and the diminution of municipal open space (Gans:1968). The first large-scale interventions designed to influence the course of urban developments therefore, were largely motivated by humanitarian, and often socialistic ideals, and where the product of groups of dedicated reformers. In England, the housing conditions of the urban poor was a major problem. It was attacked by the sanitary reformers - men such as Farr, Chadwick and Shaftesbury (who sponsored the first housing acts in 1851); by the establishment of philanthropic building societies; and through the construction of new model estates.

This reformist movement dominated attempts to improve the urban areas up to the end of the century. In England, further health, housing and employment acts continued to attack the inner urban blight, and investigation into conditions of urban living developed on a new scale under the guidance of men such as Seebhom Rowntree, who was responsible for the Report of the Royal Commission on the Housing of the Working Classes (1884-5), and Charles Booth, whose monumental 'Life and Labour of the People of London' was published in 1889.

A new kind of more positive outlook gained prominence during the 1880's with the launching of the 'garden city' movement in England and the tremendous interest created by the Columbian Exposition at Chicago which epitomized the 'City Beautiful' movement in America. The Chicago Fair of 1893, celebrating the quadricentennial of Columbus' landing in the New World, comprised a 600-acre demonstration landscape known as 'White

City on the shores of Lake Michigan. More than 20 million Americans visited this "temporary wonderland":

Here was an enthralling amalgam of classic Greece, Imperial Rome, Renaissance Italy, and Bourbon Paris, as improbable in the Midwest as a gleaming iceberg would be in the Gulf of Mexico, yet somehow expressive of the boastfulness, the pretensions, the cultural dependence, the explosive energy, and the ingenious optimism of industrial America... the millions gaped and admired and almost disbelieved that so much beauty had sprung up in Chicago, city of grain and lumber and meat, city of railroads and smoke and grime. The entire enchanting spectacle was a thrilling revelation of the power of architects, landscape architects, sculptors and painters to evoke rapture and delight. (Scott: 1969:33)

The role of this "plaster fantasy" as a symbol of what was possible, and as an inspiration to other city fathers and young professionals far surpassed its intrinsic significance. The park landscape of White City, largely the work of Frederick Olmsted, set standards for the beautification of the city through the development of fine parks integrated with an upgraded civic architecture.

The publication of Ebenezer Howard's "Tomorrow - a Peaceful Path to Real Reform" in 1898, the subsequent foundation of the Garden City Association, and the establishment of the first garden city at Letchworth in 1903, had a similar catalytic effect on ideas for town development and improvement in England. Few of his proposals were entirely novel, but he was able to pull together many existing strands of critical and innovative thought and present them as a cogent and comprehensive scheme for the construction of new towns. The garden city was to grow to a maximum population of around 30,000, organised into a series of

concentric circles demarcating the civic centre, residential, industrial and recreation areas, with the outer fringes devoted to agriculture. Growth would be by the establishment of another garden city beyond this zone of country, until gradually a cluster of such cities would come into existence.

The idea of the garden city was advanced as a panacea for the many dwelling problems of the late 19th century. The essence of the plan was that the community should control the ground, and that all profits through increases in the value of the land should be returned to the community in order to discourage speculation of any sort... it was no mean achievement at which Howard aimed. He aspired to nothing less than the abolition of the evils of the industrial revolution, the elimination of slums and overcrowded industrial districts.  
(Giedion: 1967:782)

His actual achievements on the ground were relatively modest, being plagued chiefly by financial difficulties, but his work crystallized new insights into the possibilities of bridging the gulf between town and country and taking control of town growth out of the hands of speculators.

The permanent legacy of the apostles of the city beautiful and the garden city is not found in the bricks and mortar of White City of Letchworth, but in the powerful idea, backed by demonstration, that cities could be transformed and built anew, along quite different principles to those that had guided the initial urbanising frenzy.<sup>2</sup> In the garden city in particular the utopian vision of the social reformer and the determinism of the civic design tradition meet in a new conception of the city that is sensible and practicable. Even though resources were scarce for such innovations, conceptual barriers to a more active orientation towards the problems confronting urban

populations were removed by such vision, and it became more possible to think in terms of creating urban habitat more responsive to human nature, as well as coping with the existing conditions.

At the turn of the century, housing and the social malaises of crime, poverty and disease were still the critical problems that aspirant planners had to face in England, though the Royal Commission on London Traffic in 1905 marked the recognition of a powerful new debilitating force. Progressively, the opportunistic interventions of reformers were supported by the introduction of legislation giving positive powers and responsibilities to city and municipal authorities, and by the development of a professional interest and concern in planning as well as simply building cities, among architects and engineers. England's first Town Planning Act of 1909 was in some regards simply an extension of provisions previously enacted, but was of critical importance as a symbol of change in orientation of policy towards recognizing the need for a more comprehensive form of attack.

This act showed evidence that many of the arguments of the town planning movement were understood. That the scope of town planning should be wider than that found in the older sanitary and housing legislation. The next act stated that the general object of town planning schemes was to secure 'proper sanitary conditions, amenity and convenience in connection with the laying out and use of land (covered by the scheme), and of any neighbouring lands' (as quoted in Ashworth: 1954:184).

In that same year the opening of the School of Civic Design at Liverpool University under Patrick Abercrombie symbolized the growth of a specialised interest in the problems of city development, and it was only a few years later, in 1913, that the British Town Planning Institute was founded, drawing its membership principally from the Royal Institute of British Architects, The Institution of Civil Engineers, and the Surveyors Institution. The American Institute of Planners was founded shortly afterwards in 1917.

The emergence of the planning profession in America belongs to the period 1907-1919, America's progressive era. The full building up of the urban areas exhausted the adaptability of the stark grid pattern, and the increasing density and conflicts of users drew more attention to the welfare dimensions of planning. Although there were a few piecemeal reports before 1906, there were no surveys, general planning, or professional planners as such. Between 1907 and 1917, over a hundred towns undertook 'comprehensive planning', half of the 50 largest cities, 13 percent of all with populations over 10,000. By 1917 there were dozens of municipal information clearing houses, a range of technical literature, and three planning orientated magazines whose aim was to record knowledge of planned cities and the history of 'municipal science in the making' (Hancock: 1967:294).

As in England, 1909 was a pivotal year, being in this case the date of the first National Conference on City planning and the problems of Congestion, convened at Washington, with

representatives from 'health, housing, law, social work, engineering, architecture, landscape architecture'. The N.C.C.P., as it became in the following year, developed into the chief forum for the discussion of urban reform and technical means for achieving it.

In the early decades of this century therefore, planning became institutionalised, and set about the formulation of legislative instruments and planning techniques that would make the conscious and deliberate control of city expansion a normal policy concern of local and central governments. Then as today, the planners were part of a relatively small intellectual elite who saw more clearly than the masses of city dwellers the traps of congestion, spiralling land costs, neighbourhood decay and ghettoization, the loss of open space and other amenity, but as the servants of less far-sighted political masters, their advances had to be piecemeal and not revolutionary. Generally, to extend the existing city was easier than to conceive and implement new forms for urban areas, and try to win acceptance for them, and the development of housing estates and garden suburbs on the urban fringes, often influenced by Perry's 'neighbourhood unit' concept, absorbed far more of the young profession's attention than new town ventures.

Planning became identified with the spatial problems of land use, and identified as its chief instruments the master or Statutory Plan, which combined zoning regulations with a variety of codes establishing standards for the construction of housing, roads, utilities and so on. Gans records that the early decades

of 20th century planning in America were characterised by the emergence of semi-independent commissions staffed predominantly by architects and engineers, whose bias towards physical determinism was consolidated in a Master Planning ideology

The typical Master Plan, which has changed relatively little since the first one was drafted in 1914, portrays a future ideal: a city without slums, divided into zones for each major land use, with efficient highway and mass transit systems, vastly increased amounts of open and recreational space and other public cultural facilities, and served by a system of neighbourhood, district and downtown retail and civic centres. The proposals for new facilities and re-arranged land-use and transportation patterns are synthesized into a master plan map, with proposals for implementing this map through a zoning ordinance to order land use as prescribed by the plan, building codes to discourage slums, subdivision regulations to guide the development of vacant land, and governmental re-organisation schemes to implement the proposed changes.

(Gans: 1968:130)

Scott notes that the foundation membership of the American Institute of Planners numbered 52, and included "fourteen landscape architects, thirteen engineers, six attorneys, five architects, four realtors, two publishers, two 'housers', and an assorted group of writers, tax specialists, land economists, educators, and public officials" (Scott:1969). In comparison to England however, the prospects for extending physical planning into the socio-economic realm were already advantaged by the establishment of sociology as a respectable discipline, and the interest of men such as Park and Burgess in the specific problems of 'urban social ecology'. There was also in America an earlier recognition of the need for extending the concern for metropolitan planning beyond the city boundaries to embrace regional planning, a need formally recognised in the New Deal

programme of the 30's, and given its model expression in the Tennessee Valley Authority. The inter-war period was also marked by growing recognition of the importance of national economic planning, and the need to integrate urban development with planning at this level. The Roosevelt administration championed national planning, and in its first year approved a National Industrial Recovery Act from which the National Planning Board was created in 1933.

A number of new ideas in community development were put forward and experimented upon: Perry's concept of the neighbourhood unit of between 3,000 and 10,000 people, centred on their own schools and shops; the Radburn housing and estate development in New Jersey (1929); Tugwell's ambitious programme for Greenbelt towns - satellite communities on the perimeters of existing cities to house in garden city conditions the inhabitants of inner city slums, which were to be torn down and replaced with parks; Frank Lloyd Wright's concept of Broadacre City - a self-sufficient, low density, rural community; the 'parkway' system, precursor of present urban freeways, largely the inspiration of Olmsted.

The early years of town planning in England also boasted some far-sighted and creative individuals, in men such as Raymond Unwin, Patrick Geddes, and Patrick Abercrombie. As in America however, the need for a radical redirection of urban development patterns was not sufficiently obvious or sufficiently pressing at that time for any comprehensive policy to replace the practice of coping with the expanding population and their increasing mobility through the accretion of suburban housing

schemes, and from the 1930's, the construction of city tower blocks, many of which became slums on a vertical plane, replacing their horizontal predecessors. The garden city idea was 'corrupted' by translation to the 'garden suburb', and raised objections due to the amount of agricultural land thereby consumed, and the commuting problems that it enormously amplified.

Nevertheless, just as the basis of intervention had previously been enlarged from health and welfare concerns to the regulation of land use and building structures, the horizons of town planning continued to enlarge. There were signs that among a few people a changing concept of the scope and nature of town planning was becoming acceptable, where the emphasis was moving from the design of residential estates to the more general problem of the allocation of land among various uses (Ashworth: 1954:202). Planning was beginning to be viewed then, less in terms of mere visual appearance, health and amenity, and more in terms of economic function. But as stressed above, by 1930 these changed views were those only of a minority and their subsequent spread through the town planning profession and their achievement of some influence on public opinion was of major significance in the development of a recognisable national town planning policy.

Many of the strengths of the British town planning tradition (and perhaps some of its weaknesses) derive from its national statutory basis, and the strong links which this has forged with the local government organisation. Since the first revision of

this statutory basis in 1919, which obliged every borough and urban district with a population of more than 20,000 to prepare a town-planning scheme, to the town planning act of 1968, which includes a statutory guarantee for the citizen - that he must be given the pertinent information about intended schemes and the opportunity to comment, town planners and town planning have had a recognised role in local government administration, and urban development has been an agenda item of local politics. While practice has seldom matched provision, there is as a result a well established tradition of public involvement at least of the negative sort - undesirable or unwanted schemes being blocked by public protest.

#### The Current Urban Crisis: Cities in Turbulence

The first 40 years or so of professional town planning in Britain and America was naturally a period of trial and error, in which the young but rapidly expanding body of professional planners strove for legitimation in the eyes of public and politicians by originally cautious and usually poorly-funded attacks on the worst problems of the city, brought about by the rapid industrialisation of society during the preceding century. Experience in such problem-solving accumulated, and together with the expansion of planning education in the universities, contributed to an ever-enlarging base in information and relevant skills. The two World Wars and the intervening Depression were perhaps in the long run a boon to planners, helping to establish a climate of opinion more favourable to active large-scale interventions, while the widespread

destruction during the second war in many industrial centres in Europe, provided a unique opportunity for extensive rebuilding. Although all this occurred many decades after the industrial age city had arrived, there were signs that its novel dimensions and their implications for an industrial way of life were being recognised and attracting the special attention and larger resources that they deserved.

From the vantage point of the present, it appears that the emergence of town planning as a separate specialised function of government was in itself no more than the orthodox reaction in society to Type III conditions of complexity. Under such conditions, as in the oligopolic market, the identification and conceptualisation of a new problem area or of new opportunities arising in the field is met by the creation of a new functioning body with a mission explicitly directed at exploiting or neutralising the changed circumstances. There thus arises a rough one-to-one correspondence between organisational elements and publicly identified areas or jurisdiction, with some elements disappearing as they pass from the public policy agenda and fall to the bottom in budget priorities, and other being added as new causes are won or new contingencies arise. At the national level the titles of government portfolios and public service departments not only allocate responsibility, but condition and reflect the way in which societal problems are perceived. The establishment of separate organisations, sections and positions with responsibility for city planning has generally reflected the felt need for some co-ordination and guidance of the processes of the growth and regeneration of

urban structure, that cannot be adequately met within the framework of existing administrative responsibilities. In the government of cities, city planning therefore took its place alongside departments of housing, health, employment, education, social welfare, water, sewerage and electricity authorities, and so on, with prime responsibility for the physical structure of the city.

Although it is obvious that the separation of domains of concern such as housing, education, and employment inevitably imposes a somewhat artificial division upon often very complex individuals and social circumstances, it is a system that can work at quite a complex level of needs and demands, providing that there is an adequate level of co-ordination among the many providers and regulators, so that their governmental roles are not only to a degree mutually exclusive of one another (avoiding duplication) and collectively exhaustive of the reasonable demands of the community they serve, but that they are sufficiently in touch and in agreement on objectives to be able to re-allocate resources and responsibilities among themselves when the need arises.

There now seems to be general agreement that in the years since the end of the last world war a whole new order of problems has arisen in the city, and the metropolis the theatre of war in which some of the most divisive and pervasive problems of societal regulation are currently having to be faced. The rapid growth of the metropolitan areas, their coalescence into conurbations and 'megapolis', caused by rural-urban migration

and natural increases in population, is itself an element of the drift into post-industrialism; the pathologies of the metropolis, which have been so thoroughly described over the last three decades, are symptoms of the turbulent society discussed in earlier chapters - the unregulable residue of disorder and distress beyond the powers or capacities of existing institutional arrangements (Fischer: 1976).

As the city planners were winning for themselves a recognised and respected role in urban government, and working out the manifold ways in which their responsibilities for planning the physical environment related to the responsibilities of other bodies concerned with local government, health, public transport and so on, the environment to which their activities were adapted was itself in the embryonic stages of a revolutionary change which may now be summed up as 'metropolitanization'.

### The Metropolis

The preconditions for the present crisis are to be found largely in the phenomenal rates of growth of urban areas during this century. In the period 1900 - 1950 in the United States for example, when the total population increased from 76 million to 150 million, the number of cities with populations in excess of 100,000 increased from 82 to 147, and their total population from 24.1 million to 84.3 million, representing a percentage change in the metropolitan population from 31.9 per cent to 56 per cent of the nation's population. In 1960 approximately 63 per cent of the total population were living in 212 Standard

Metropolitan Statistical Areas, whereas the proportion of the population living in urban areas corresponding to these S.M.S.A.'s in 1940 was only about 40 per cent of the total. Behind these rates of population increase lies a qualitative change in the nature of the urban areas and the nature of urban living (Statistics from Glaab and Brown: 1967).

The 20th century has seen the growth of the metropolises in the United States reach a stage which represents a dramatic demographic development going beyond the mere statistics of population. Involved in the concept of the modern metropolis are complex changes of function and structure within the city and its suburban areas - decentralisation of numerous activities, separation of areas of residence and work, and a high mobility over greatly extended spatial areas, together with involved relationships with other cities and urban areas outside the immediate limits of the urban region.

Whereas the term 'metropolis' has been used to refer to the extension of the influence of the large city over enormous metropolitan peripheries, the term 'megalopolis' has had to be invented to describe vast urban regions such as the eastern USA seaboard that contain several linked metropolitan centres. We have then the notion of the United States as consisting essentially of three or four loose, sprawling megalopolises separated by small stretches of largely empty countryside. It may be said that the city is destroyed by its own success (Boulding: 1963). The paradox is that by the time 90 per cent of the population are urban, the city has really ceased to have any meaning in itself.

As an Australian, I find it still occasions surprise that Australia, with a fraction of the population of the United States occupying an area not a great deal smaller, is in fact more highly urbanized. Not only is the population as a whole highly urbanised, but it is concentrated in the six state capitals, which contained 57 per cent of the national population in 1966 (a figure which has more or less stabilised), though this concentration has increased progressively throughout this century as the following table indicates.

STATE CAPITALS	percentage of state's population		metropolitan area population
	1911	1966	1966
Sydney	42	58	2,447,219
Melbourne	45	65	2,110,336
Brisbane	23	43	719,278
Adelaide	45	66	720,279
Perth	38	59	500,246
Hobart	-	32	119,469

#### Degree of Urbanisation in Australian Capitals

Whereas only 30 per cent of the national population lived in the capital cities in 1901, it is expected that 70 per cent will do so by the end of the century. The current planning for the Sydney region envisages a growth in Sydney's population from 2.7 million in 1968 to about 5.5 million by the year 2000, by which time the annual growth rate may be approaching 100,000 people a year. Rural New South Wales, of which Sydney is the capital, represents something of a mirror image, with 85 of its 130 shires having negative growth rates in the period since 1961 (Census Statistics. Australian Bureau of Statistics: 1966).

Although the scale of urbanisation and its consequences are of a different order of magnitude for Australia, compared to North America and most of the European countries, the planning problems of the large metropolitan regions, in terms of this thesis, are equally those of regulating turbulence. The failure so far to meet the requirement of such highly uncertain and volatile planning environments is acknowledged in the major resolution of the 'Canberra Forum' in 1970, a novel alliance of planners and Cities of the 21st Century:

We, the Canberra FORUM of Australia's Architects, Planners, Landscape Architects and Architectural Students, having met in serious discussion and considered expert analyses of the future of our urban areas, are forced to the following conclusions:

- \* Australia is facing an urban crisis
- \* Our sordid, sprawling cities are the result of past indifference and lack of co-ordination and forethought
- \* Our environment has not been planned, - it has just happened
- \* In part, the cause has been that the responsibility for our cities is divided amongst dozens of authorities
- \* In part, it has been that we have not considered carefully enough the long term consequences of economic, political and social politics.

We voice our alarm to all levels of government and offer a National Alliance for immediate action in order that our urban society is not overwhelmed by this crisis.

The abilities and the resources to deal with these issues already exist. What is required is mobilisation of these resources and the opportunity to get on with the job. (Canberra Forum 1970, Proceedings: xi)

The American authors of 'Metropolis in crisis' caution against the exaggeration of the difficulties to be faced:

The widespread use of the concept crisis calls for a sober appraisal of the very term and the reasons why we use it so freely... it should be recognised that excessive use or misuse of a concept may result in a weakening of its impact. The work crisis calls for a response and if it becomes commonplace it may no longer convey a sense of urgency. Our use of the word crisis in the title of this volume is not without some misgivings. But if crisis is an appropriate word to use at all, it seems to us appropriate to apply it to the city.  
(Hadden et al: 1967:vi-vii)

The prevailing image, even in the early years of this century of the city as 'urbs' in an agricultural surround, determined in its form and function by physical considerations such as the need for defence, access to production and topographical characteristics, and maintained by fixed and established networks of transportation, communications and service facilities, has guided the management of urban systems even while such considerations became obsolete or irrelevant.

While the more obvious obstacles to the wholesale replanning of cities have been those of financial and real estate interests (McHale: 1969:289), much of the present failure to conceive of new city forms lies with the traditional ideal form model. This has become restricted to the 19th century version of the multi-purpose city as a static agglomeration of commercial/ industrial production and distributing points related to materials, transportation and warehousing. Urban living was tucked into the interstices of a system for earning a living or controlling the production and flow of material goods and wealth.

In contrast to this conception, the city has become during the last three decades a chronically self-exciting system, initially primed by its dramatic increase in size and scale. Radical increases in urban population due to the focussing of economic activities in the city areas places an intolerable strain on both housing capacities and the capacity of original core areas. The multiplication of users chokes the central business district, where commercial and office enterprises expand upwards in high rise buildings to meet new demands for space. Inner city dwellers, unable to face new levels of inconvenience and soaring land prices retreat to the suburbs. The suburbs, already expanding into the countryside to cope with migration to the city and the rehousing of slum dwellers, aggravate the greater costs of utility provision in outlying districts. The expansion of suburbia defeats its own benefits when employment is left behind in the city and the 'journey to work' problem adds psychic costs and volumes of exhaust fumes to the balance sheet of city living. The industrial and manufacturing enterprises required to produce the consumer goods of the swelling population and the wages to guarantee their consumption, further destroy the natural amenities of clear air and water, and freedom from noise. The construction of city freeways and requirements for on-site parking in city offices bring more vehicles into the centre faster than before, at an enormous cost in land acquisition and rehousing schemes, and at the same time reduces the appeal of public transport systems. The forced relocation of industry, and the voluntary relocation of retailers away from the centre, enhance its environmental possibilities and help solve suburban shopping problems, but at

the same time remove the tax base from which comprehensive improvement schemes might be financed.

### The Problem of Growth: the Turbulent Environment

While a village may grow into a town through increases in the scale and capacity of its retail, residential, production, recreation, transport and utility systems and continue to function without undue interference between the requirements of these different elements, the passage to metropolitan scale has resulted in their mutual invasion and excitation with the increasing competition for space, freedom of movement, and other scarce resources. The traditional jurisdictional boundaries of government and administration are overtaken by the appearance of meta-problems, and the probabilities of the effective co-ordination of agencies successively reduced by their increasing numbers and specialisation.

Traffic is just one example of such a meta-problem. As the Buchanan report has clearly demonstrated, the problem of city traffic can no longer be thought of as a problem that has to do simply with vehicles, roads and journeys, if we are to have any chance of working out a tolerable solution, but has to be approached conceptually and operationally as a problem of the whole system (Buchanan: 1963).

Contemporary literature on the city as a human habitat is characterised by its pathos, reflected in many of the titles that have been chosen: "The death and life of great American

Cities" (Jacobs: 1962), "Cities in trouble" (Glazer: 1970), "Cities in a race with time" (Lowe: 1967), "Metropolis in crisis" (Hadden et al: 1967), "The exploding metropolis" (Fortune: 1957), "Sick Cities" (Gordon: 1963), "Taming megalopolis" (Eldredge: 1967). Their chapter headings catalogue the meta-problems that the metropolis has to confront. Crime and juvenile delinquency, racial conflict poverty and urban blight, traffic congestion, pollution, psychological distress and mental breakdown. In the heightened density of interaction and interdependence of metropolitan living each of these assumes the character of a systemic malfunctioning, its occurrence and perpetuation being intimately bound up with the conditions that constitute urbanism as a way of life, such that their improvement or eradication is a problem of effecting change in the whole system.

Although Duncan and his colleagues were not primarily concerned in their study of "Metropolis and region" with exploring the dimensions of this urban crisis, they comment informatively on the underlying structural conditions with which they are connected.

The maladies on this familiar roster - traffic congestion, housing obsolescence, frictions among shifting population groups, financial quandaries, governmental fragmentation, and the like - are most likely not fundamental problems in themselves. Rather they symptomatically reflect an accumulation of lags in the mutual adjustment of units and functions of the metropolitan community-lags which are perhaps inevitable in a period of sporadic and unco-ordinated, though not unrelated, changes in community structure.  
(Duncan et al: 1960:1)

These lags or failures of adjustment are reflected especially in the multiplication of governmental and other agencies and the lack of co-ordination among them. Such organisational maladjustments are typically exacerbated by the continuous shortage of funds in view of what needs to be done, and by the characteristic difficulties of sharing out planning functions between state, city and local governments in a fashion that preserves strategic control while making the best use of initiatives and resources at the local level. More fundamentally, the global characteristics of the field within which these meta-problems become manifest include conditions which are inimical to their solution. The concepts of private property developed during the agricultural and industrializing eras, and in particular the concept of private property in land, constitute a formidable field resistance to the guidance of change in the form and functions of the city. The concept is supported by other notions of individual rights that have failed to take account of the increasing vulnerability of the public good, and the need for responsibilities as well as rights to achieve social recognition.

#### Interdependence of Systems

As internally the metropolis brings a new order of complication to public policy-making, so externally it is more and more deeply implicated in national and international systems of interdependence. The extension and filling in of the communications net at these levels put geographically distinct urban regions more closely in touch so that formerly isolated

occurrences can become national topics of interest within hours. The race riots and the campus rebellions of the late 60's in America 'went off' like a string of firecrackers, with similar armouries and tactics being used from east to west. At the same time the desperate need for Federal financial assistance links the fates of the metropolitan areas even more tightly within the ambit of national economic strategy and success. Even though the costs of completely rebuilding the decaying city centres will be enormous, comparisons with the costs of the Indo-China war are invidious, and outspoken leaders such as John Lindsay made an issue of reconstruction at home versus destruction overseas.

#### Recapitulation: The Need for New Strategies

As outlined in earlier chapters, the dimensions along which social fields are becoming transformed - the acceleration but unevenness of change, increasing overall size and complexity together with greater interdependence of the constituent parts, and such symptoms of this transformation as future shock, fragmentation of the social fabric, alienation, and increasing vulnerability to becoming ecologically trapped, are especially descriptive of those regions of the sociosphere in which the metropolitan way of life has become established. The rapidly altering city skyline - new buildings going up and the old coming down, and new road configurations requiring adjustment to mental maps of the city; the powerlessness and insignificance of the individual voice and the diminution of the individual's private world (Slater: 1975); the immense vulnerability of the

life of the city to power, garbage, and transport strikes; the great stumbling blocks of personal motor transport and private ownership of land, threatening and adaptive capabilities of the public body by upholding its democratic traditions.

Both those formally engaged in the maintenance, management and planning of the urban habitat, and those for whom it is the milieu of their social existence, experience an expanding range and variability of conditions that have to be taken into account, an increasing differentiation and specialisation of the component parts and functions, and an overall volume of change and variety that challenges institutional and cultural capacities of absorption.

For example, the growth of cultural pluralism and the variegation of values across the social field, that are the reflection of cosmopolitanism, present both puzzles and threats to the culturally orthodox, and further complications to the managers and planners obliged to respond to community value preferences. While the segregation of ethnic groups in the cities of Australia, England and America enhances their prospects of cultural survival and self-control, this increases the heterogeneity of the whole system and may be at the expense of its control when the relations of the life of such sub-systems to the goals of the total systems are not well appreciated. The individualism and cultural permissiveness of districts such as San Francisco's Haight Ashbury, Chelsea's Kingsroad and Soho's Carnaby Street in London and Sydney's Kings Cross, evoke reactions as varied as the individuals they

attract, but as enclaves of individual and social experimentation they compound the 'surfeit of subcultures' (Toffler), adding to the bewildering variety of alternative life styles.

The crisis for city planners engendered by the urban population explosion and the 'metropolitanization' of the city is that of reconciling the gap between present planning capabilities and the kinds of response that are demanded by an environment that is beginning to assume its own dynamic. The problem of regulation for the formal metropolitan planning organisation is one that can no longer be met through its 'organisational set' - the network of reciprocal relations with other powerful organisations. Greater co-ordination here is a holding action, but no solution in the long run when the ground underneath all of these systems is itself shifting. Toynbee introduces an extremely apt metaphor for comprehending the transformation that is occurring, when he refers to 'cities on the move':

... Some people in technologically 'advanced' countries have become aware that our cities are now on the move, and have become alive to the consequent menace to the well-being of mankind and perhaps even to its survival. We have awoken late in the day, and we cannot yet tell whether we shall have been too late to save ourselves from being overwhelmed by the onrush of our mobile cities. Present-day cities are moving at the speed of an avalanche rather than of a lava flow, not to speak of a glacier.

(Toynbee: 1970:3-4)

#### Maladaptive Responses

Looking at these problems in terms of the previously presented framework, my earlier analysis of system adaptations to their

environment identified two forms of maladaptive response to turbulence, the active and the passive, the former corresponding to the persistence of strategies appropriate at the disturbed-reactive level of environment, and the latter to attempts to downgrade the inherent complexity of the situation by artificially segregating it into segments that can be coped with by already understood behaviours. The dynamics of the passive maladaptations were suggested by Angyal, and have been elaborated by Emery:

It seems only natural that men will seek ways of reducing the turbulence to the point where their learnt responses to disturbed reactive environments are again adaptive. Any generally effective way of doing so implies segregation (Dis-integration) of the social field so that men have to cope with only a part or an aspect of that field. All such responses are forms of passive adaptation. They are triggered off by the environment. They are also essentially defence mechanisms in that they seek to negate, downgrade, the environmental texturing with which they are confronted. (Emery and Trist: 1972:58)

Purposeful systems have choices in the ways in which they can segregate turbulent environments and counter their over-complexity and over-stimulation, yielding the three previously discussed patterns of superficiality, segmentation and dissociation. They can sacrifice their psychic and the deeper cultural bonds, or zeitgeist, as axioms for determining the basis of what is to be responded to; they may concentrate on the pursuit of their separate and selfish ends in disregard of the integrative needs of the wider systems of which they are part; and they may dissociate themselves from the collaboration with others on the co-production of social ends. These defensive strategies are more likely to be pursued by those

parts of the field constituting the ground upon which the figural matrix of powerful organisational elements imposes structure under disturbed-reactive conditions (See especially Chapters 1 and 3 and Emery and Trist: 1972:57ff).

The three corresponding active maladaptations, which have not been previously identified - synoptic idealism, authoritarianism, and evangelicism, are mechanisms of 'attack' rather than defence, and seem more likely to be adopted by those units which represented the loci of power and field determination under the simpler environmental conditions. Responses of this sort are based on a misrepresentation of the new field forces coming into operation, and treat the over-complexity of turbulence as though it were a purely quantitative modification of the existing level, requiring greater organisational capacity to mobilise resources and the refinement of existing regulative procedures.

Passive responses to the bewildering transformation of personal and organisational environments in the zones of concentrated urbanisation are manifest in withdrawal and reduction of commitment - a greater indifference to incomprehension, both personal and institutional, to the fate of the wider systems and the quality of the whole environment. Attempts to define a new and more constructive role for the corporation in the post-industrial urban realm offer hopes of a more positive engagement between corporate and community requirements, but still lack significant practical expression.<sup>3</sup>

At the personal level, apathy towards local government organisations as potential vehicles for action, and limitation of involvement in the planning process to obstructive protests when self-interests are threatened, simplify personal worlds, the worlds of individuality, at the cost of energies available to the community as a whole. The physical withdrawal to suburbia, and thence behind family walls and fences, has similar effects in severing possible lines of action.

After reviewing some of the commoner criticisms of suburbia - the psychological consequences of scattered low density living, the increased cost of utilities, the use of valuable farm land, and so on, Gans comments:

A much more valid criticism of suburbanization is its effect on class and racial segregation, for the fact that the suburbs have effectively zoned out the poor and the non-whites is resulting in an ever-increasing class and racial polarization of city and suburb.  
(Gans: 1970:44-5)

C.Wright Mills exercises a popular theme of his, the contrasts between 'private troubles' and 'public troubles' in discussing the comparable strategy of the rich:

For many upper-class people, the personal solution to 'the problem of the city' is to have an apartment (with private garage under it) in the heart of the city and 100 miles out, a house and garden by notable architects, on a 100 acres of private land. In these two controlled environments - with a small staff at each end and a private helicopter connection - most people could solve many of the personal problems caused them by the fact of the city. But all this, however splendid, does not solve the public issues that the structural fact of the city poses.  
(Mills: 1963:395)

By such means as these social and psychological distances can be maintained and personal worlds can remain relatively inviolate in the midst of revolutionary changes. The power of such defence mechanisms become manifest when 'undesirable elements' intrude into homogenized suburbs and elicit communal rejection symptoms, and in the staggering dissociation of passers-by from violent personal assaults on city streets (The Argus: 29.7.83).

### Superficial Responses

Insofar as superficiality of responses becomes a dominant characteristic in social aggregates, and conformism, fashionability, conventionality and the like come to guide the selection of objectives and activities, eccentricity and non-conforming behaviour are likely to be viewed as subversive. Thus, members of society are thrust aside or move aside, not because they constitute a viable social sub-system with goals in conflict with the larger system, but because as individuals they are non-conforming. They refuse to be indifferent to the costs of their individual behaviour and are outcast as alcoholics, perverts, beatniks, eggheads, or punks. This maladaptive mode can become such an unquestioned part of social life that integrated communities of schools and families can tear themselves apart, for example, on the length of boys hair, without laughing as they do so. Thus, insofar as the non-conformists are an identified source of social variance, then their exclusion seems to reduce the total amount of relevant variance in the environment (See Chapters 2, 3 and 4).

Dissociation on the other hand is primarily a psychological copying mechanism that does not require or create social consensus (Emery and Trist: 1972) The pay-off, the apparent adaptiveness of the mode, is some sort of positive function of the extent to which the individual lives his daily life, travelling, earning, working, entertaining is a mass condition. Little wonder that dissociation (Durkheim's anomie) has always been a charge laid by traditional societies at the gates of the cities. In turbulent environments it is not the mass character and anomie per se that encourages this mode of passive adaptation but the increasingly unpredictable nature of what might follow from even seemingly trivial involvement with others.

Similar strategies are available to planners and others with responsibilities for the guidance of change within the whole system, when this becomes dynamic and unstable to a degree that makes attempts at overall regulation appear futile. Such segregation is likely to appear conceptually as well as in the performance of tasks, in the way in which the system to be planned is conceived, and the way in which planning roles are defined and defended. Thus even while the tides of urban-rural migration were flooding the cities and laying bare the countryside traditional master planning with its basic tool of the zoning ordinance stopped at the city limits, drawing a political boundary around its area of concern when the decisive phenomena were socio-economic. While it is now almost de rigueur for metropolitan plans to be conceived in regional terms, including the area within which the metropolis exerts a decisive

influence, and within which its growth may be contained, the major change thereby effected is often greater control over peripheral subdivision and the inter-metropolitan communication net, and not the needed reconceptualization of the metropolis as an organic part of the wider state and national networks of resources and activities.

Just as areas of concern can be physically circumscribed in a way that places some limits on the problems to be faced, so can the planners role be defined in a way that demarcates his responsibilities. The lengthy preoccupation of city planners with physical land-use planning has thus had the effect of insulating them from many of the problems and pathologies of city life that appear to be extraneous to the system of relationships operating between the built environment and the behaviours of people. Davidoff quotes from Farbman on the consequences of the 'physical bias':

The physically biased planner plans on the assumption (conviction) that the physical problems of a city can be solved within the framework of physical desiderata; in other words that physical problems can be adequately stated, solved and remedied according to physical criteria and expertise. The physical bias produces both an inability and an unwillingness on the part of the planner to 'get behind' the physical recommendations of the plan, to isolate, examine, or discuss more basic criteria...

(Davidoff: 1965:338)

When city planning is reduced to physical planning it tends to be seen as a set of design and engineering problems and not of socio-economic and political problems. In these terms the city may be viewed as a functional system, or instrument, for

satisfying the needs, or at least some of the needs of its inhabitants. The task of planning centres on the ordered provision of all the ingredients that are deemed necessary for city life - such elements as housing, industry and commerce, education, transport systems, health, sporting and cultural facilities have to be provided and functionally related to one another. For these purposes people may be regarded simply as house-holders, members of the labour force, consumers of power, goods and services, car drivers, and so forth. If behavioural assumptions are added, they tend to be assumptions about tendencies of individuals to maximise or optimise certain behaviours. Thus for example the model of rational economic man may be adopted and employed in planning decisions concerned with the provision of public transport or retail facilities, and together with other simplifying assumptions, issues in planning techniques such as gravity modelling and central place theory. Other assumptions may be made - for example that vehicle drivers will always take the most direct or the fastest route between two points, that people want to maximise their standards of living, that people prefer clean and modern buildings to ancient and decayed ones.

This may be something of a caricature, but not necessarily too exaggerated. Physical planners must be concerned to optimise the physical environment of the city - to build a system for living in that is functional, economic and efficient. The important things to know about people are what they need and what they want in the way of facilities, and whether they like or do not like various aspects of the built environment, so that

when the opportunity occurs for building it again, their needs may be better satisfied. For the physical planner the relevance of the social sciences, if any such thing is acceded to, is thought to lie in their ability to explain and predict the relations between particular physical structures and environmental settings, and the kind of social behaviours that they give rise to.

A further consequence of viewing the city primarily as a physical system from the point of view of planning, is that it becomes easier for the planners to seek legitimation in terms of expertise and professional qualifications, and correspondingly more difficult for the layman to penetrate to the planner as a human being and to discuss planning issues with him from a position of equality. Computerised 'retail market potential' and 'travel demand and traffic assignment' models for example, and most problems that are defined in 'engineering' terms, tend to have optimal solutions. In locating these, the planners can acquire a good deal of useful information, and may be able over time, to improve their performance through learning. On the other hand the citizen is effectively excluded as a partner in the exercise, never having enough understanding of the principles involved to be able to differ with confidence. This would seem to be as much a problem for the planner as the citizen.

The negative regulatory mechanism of zoning ordinances and municipal standards have in the past accentuated the segmental tendencies inherent in a style of planning that maintains a

simplistic physical determinism. The absurdities of this style are irrefutably demonstrated in the contrasts between physically decayed slums which are the home of vigorous communal life, and physically superb planned neighbourhoods in which individual isolation and loneliness reflect the lack of any communal life.<sup>4</sup>

The planning profession can seek to defend itself from over-complexity by defining the planner's role as one of limited and specialised responsibility in urban management, by fracturing planning into isolated 'projects' of renewal, residential development, road construction, redevelopment schemes and so on, or by 'dampening' or ignoring the unwanted 'noise' of the socio-political repercussions of physical planning. Such strategies are pursued at the cost of the increasing irrelevance of the planner and greatly enhanced prospects of a massive structural breakdown.

Of the three passive responses Emery has concluded that:

- a. they are mutually facilitating defences, not mutually exclusive;
- b. they all tend to fragment the spatial and temporal connectedness of the larger social fields and focus further adaptive efforts on the localised here and now;
- c. they all tend to sap the energies that are available to and can be mobilised by the larger systems and otherwise to reduce their adaptiveness,

(Emery and Trist: 1972:66)

It may help to place the active maladaptive responses in perspective by attempting at the outset a similar summary statement of their impact. Because they too correspond to the

set of system dimensions - the dimensions of depth, progress, and breadth - they also tend to be mutually facilitating and supportive, rather than exclusive. In the second place however, they are each intended to impose a greater coherence and integration on the field rather than to fragment it, and attempt to do this by focussing adaptive efforts in the field as a whole towards defined objectives lying in the future. Finally, they also tend to reduce the total adaptiveness of the larger system, but in this case through attempts to impose limits on the potential variability of the constituent sub-system.

As with dissociation, evangelicism seems to differ from the other two types of response in that it is essentially an individual response rather than a symptom of socially induced forces. It differs from dissociation in seeking to make the anonymity and uncertainties of mass living manageable not by the erection of barriers to involvement with, and concern for other, but by seeking to unite people under some common cause, or within a common ethical system. Simplistically, the contrast is between the controlled 'management of self' learned by regular travellers on the subway or underground and the curiously regarded inter-personal enthusiasms of the commune and the Salvation Army singers.

In some respects the evangelical response may be more potent for the individual as a tactic of withdrawal, allowing him to escape from the stresses of his situation in 'folk' or communal settings. It becomes an active response in the context of field problems through proselytization and the promotion of solutions

which rely on consensus of beliefs and values. While the belief that the world's problems would dissolve if everyone was willing to subordinate themselves to the same ethical system is clearly a persuasive one, any programme for bringing this state of affairs about must be hopelessly idealistic.

Authoritarianism is more commonly institutionalised as a response to turbulent conditions. In the unconventionally wide sense in which authoritarianism is thought of here, it refers to the tendency of existing powerholders and decision-makers to try to maintain their control in more dynamic fields by curtailing the freedom of movement of other parts so as to limit the variability of their possible behaviours. The strategies of absorption, parasitism, co-optation, competition and so on which are found to be appropriate in fields characterized by the dominance of a number of powerful organisations are 'stepped up' in an effort to cope with the new dimensions of instability.

Gouldner's analysis of the problems faced by the new manager of a gypsum plant, that had been rather loosely and benevolently governed by his predecessor, and the way in which he reacted to these problems is an instructive example of the conditions which may generate an authoritarian response and of the difficulties that its implementation encounters. The efficiency of the plant, a subsidiary of a larger organisation, had been suffering from a system of management that Gouldner characterizes as an 'indulgency pattern' in which workers enjoyed considerable freedom of movement, took home raw materials, and showed a high rate of absenteeism. The young new manager from head office

perceived this as a situation which demanded much closer control:

... There were other, less dramatic indications that Peele's actions were uprooting the indulgency pattern. One of these hinged on the increasing amount of paper work which he introduced. Whereas in the past this work was held to a mere minimum, Peele's new directives called for weekly and daily reports from foremen and building supervisors. In this manner he secured a more careful check on production results and on accidents and breakdowns. The new reports required that greater care and effort be expended for the front office could now detect failures more quickly. In its return, this constant check on the foremen necessarily constrained foremen to check up on the workers... Along with the new reports came increased restrictions that slowed down job shifting and curtailed conversation groups and loitering.  
(Gouldner: 1954:66)

The successor reflected the main office's emphasis on rational administration, and was oriented to 'rational, efficiency - enhancing values'. His efforts to achieve a higher degree of integration and control by imposing these values was not entirely successful:

Workers viewed close supervision as a kind of 'strictness' and punishment. In consequence, the more a supervisor watched his subordinates, the more hostile they become to him. Workers shared standardized conceptions of what a 'good' or legitimate foreman should be like, and almost universally these insisted that the good foreman was one who 'doesn't look over your shoulders'. From the worker's standpoint a 'driving' foreman was 'bad', and they would retaliate by withholding work effort... In other words close supervision enmeshed management in a vicious circle.  
(Gouldner: 1954:160)

In the cities in recent years it has been the political and moral confrontations of the sit-in and protest demonstrations that have evoked the authoritarian response in its clearest

form. Some ten years ago, the declaration of a state of emergency in the Australian State of Queensland, entailing an increase in police powers and the suspension of civil rights, to contain the skirmishes anticipated with the visit of the South African Rugby team has been paralleled by legislation in Western Australia which prevents people the right of assembly without prior police permission (Section 54B of the Police Act). Such legislation has been reflected in the over-reaction of the authorities to apparent race confrontations in both London and Liverpool in the late seventies and early eighties. Such moves fail in not making possible further steps towards more positive solutions even though short run goals may be achieved. The rising tide of public protest movements, for which the city is in some respects an incidental though obvious stage, may itself sometimes take the form of an authoritarian response to intolerable circumstances, but if further battles for the mind are to issue in battles for the streets, it seems important that some non-authoritarian coping mechanism be devised that creates opportunities for mass demonstrations within the city without prejudging them as conflict situations. Australian moratorium march organisers have understandably complained when city streets effortlessly closed to traffic for Anzac Day marches are closed to them to protest a later war.

Usually denied the exercise of any such direct power in the control of their environments, planners are nevertheless able to seek the simplification of the problems they have to confront by acting with respect to value frames that fail to reflect the real pluralism of community values, thus tending to constrict

the choice of outcomes that are preferred by the "deviant" groups. Charges of middle-class bias have been laid against most of the professions at some time, including city planners. The concept of a slum which equates high density and physical deterioration with the genesis of social pathologies has been repeatedly attacked on this score, and so too have some concepts of recreational open space which regard its provision in isolated islands as inherently healthy and beneficial. Stretton has attacked the bias in suburban planning in Australia towards meeting the requirements of male bread-winners at the expense of the needs of the young, the aged, and the housewife (Stretton: 1970).

It is in general far easier for planners to interact with other middle class business and professional groups, and to adopt some variant of the power elite model of the structure of community influence that it is for them to adopt a more pluralistic model and try to interact equally with the poorly organised and less articulate segments of the community. In a study of the way in which two different planning directors approached the same Boston South End Urban Renewal Project, Hyman has analysed the way in which planner's conceptions of the community distribution of power influence the planning process - the way in which influence is exerted and the kinds of groups that the planner works with.

Hunter's model of how power is organised and how social changes occur in a community appears to best describe how PT I's (the first planning team) director modelled his work; his team served as an agent of the community power elite...

In contrast PT 2 director studied city planning at a university where the pluralistic model of power as developed by Banfield, Dahl and Polshy was emphasised. These authors contend that power is fragmented in a community, so to achieve a goal it becomes necessary to concert relevant power centres through influence and bargaining.  
(Hyman: 1969:106)

While the first planner proceeded deductively to the production of a technically and architecturally fine solution, the second worked with neighbourhood groups 'to produce several discrete plans for various sub-areas, then co-ordinate them into a coherent whole through community wide citizen planning bodies' (Hyman: 1969:106). In drawing the conclusions from his study, Hyman comments:

The issue revolves around planning style, what Donald Foley has termed a 'unitary' versus an 'adaptive' approach... the planners own professional orientation will strongly influence which segments of the population he will identify with; community-wide elite or neighbourhood groups. Working with community-wide leaders will require a greater emphasis on conceptualizing holistic plans in which relationships of various parts are identified and analysed, as in PT 1's plan. Planners who emphasise working with neighbourhood bodies should be prepared to work out specific substantive programs which may or may not be related to each other but which meet the resident's immediate needs.  
(Hyman: 1969:112)

'Inductive' planning which pieces together part solutions from the grass roots level is more likely to result in solutions to the whole problem which are sub-optimal in terms of professional standards, and to be more costly in terms of time and the effort needed to engage with previously unorganised groupings. Planning responses which avoid these difficulties in searching for optimal solutions agreeable to the community elite are

authoritarian in so far as they de-value or ignore the needs of under-privileged and less articulate groups. The need to rectify such approaches from the 'consumer' end has been urged by Davidoff's concept of 'advocacy planning' (Davidoff:1965) and the energetic and creative work of Saul Alinsky in organising the ghetto and the poor in self-help programmes.<sup>5</sup>

The final form of maladaptive response, synoptic idealism, corresponds with efforts to maintain a level of control across the field by the more neutral means of comprehensiveness in analysis and rationality in policy and decision-making. Of the considerable amount of critical comment on the possibilities of such comprehensiveness in the management of large and complex systems, the attack by Braybrooke and Lindblom (1963) is one of the most penetrating.

The classical decision-making model, which they call the 'rational-deductive ideal', represents 'an ideal of science transferred to the world of values'. It begins with the unambiguous expression and ranking of 'ultimate values', from which intermediate principles to cover actual situations are derived. Thence, actual policies may be selected deductively according to the sum of values that they would promote. Thus ethics has been concerned with constructing a total deductive system for the derivation of moral principles to cover all human choice situations. The welfare function is a variant of this which substitutes rules for manipulating numerical variables for the more general techniques of deduction that are envisaged in the rational-deductive ideal, such that all the costs and all

the benefits of all possible alternatives can be assessed, and that one which maximised 'welfare' selected.

There are a number of criticisms of these received ideals, beginning with the fact that they are actually impossible to implement. When one of the chief virtues of the rational deductive ideal is claimed to be its comprehensiveness, the benefits of only partial attainment are dubious. The multiplicity of values affected in complex policy choices is such that they can never all be taken into account, and it is in fact often those values which are 'used up' in achieving others which are ignored. Further, the instability and fluidity of values over time, and the difficulties encountered in totally novel situations for which no relevant value priorities are available, together with the pervasive conflicts among values and combinations of them, challenge the worth of attempting to sum values at a particular point of time. In fact value costs are typically incommensurable, as when decisions have to be made as to what level of unemployment is tolerable for the maintenance of a certain standard of living.

The rational deductive and welfare function ideals imply a model of 'synoptic decision-making' in which fact and value are radically separated, and policy-making is comprehensive in all aspects. In such a model the goals are first established, and then a review of all the possible alternatives and their effects is undertaken. From such a review the 'best' solution can be identified in the light of the previously established goals. This synoptic ideal fails in practice because it is not adapted

to the real complexities of the decision-making environment and problem-solving situations that are encountered in social policy-making. Braybrooke and Linblom identify a number of specific 'failures of adaptation' of the synoptic ideal:

- (i) It is not adapted to man's limited problem-solving capabilities - it offers no strategy for achieving 'cognitive economy', but insists on omnipotence.
- (ii) It is not adapted to the inadequacy of available information.
- (iii) It is not adapted to the costliness of analysis - "the value of the solved problem imposing some limits on the energies worth expending to achieve the solution; and a problem-solving method patterned...after analytical methods in pure research, where the research activity is valued for its own sake, is irrational by any ordinary standards of rationality" (ibid: 50-51).
- (iv) It is not adapted to failures in constructing a satisfactory evaluative method - i.e. it offers no guide to action when a deductive scheme of values cannot be worked out.
- (v) It is not adapted to the closeness of observed relationships between fact and value in policy-making. The consideration of values cannot be realistically 'cut off' at some point, and attention devoted to means. In

particular, consideration of available means frequently generates new value questions.

- (vi) It is not adapted to the openness of the system of variables with which it contends - "for synoptic problem-solving it is difficult or impossible to define rationality except in relation to a closed system of variables...the would-be synoptic problem-solver aspires to comprehend all interacting variables" (ibid: 53). The ideal however gives no account of how 'closure' might be achieved, nor as to how the conclusions reached at any time should be handled pending closure.
- (vii) It is not adapted to the analysts need for strategic consequences of analytical moves - the ideal describes what analysts should have done by the time a problem is solved, but contains no road maps for getting there.
- (viii) It is not adapted to the diverse forms in which policy problems actually arise. In complex social situations, problems are not simply 'something which blocks an organism's attempts to reach a goal', but are typically synthetic and fluid - complex adjustment-of-interests which require continuous attention. "The synoptic ideal is too rigid in its prescription that a 'solution' be found for a problem, where all that is actually required and all that can at best be defended as a right 'solution' is that a series of reconciliatory moves be made" (ibid: 55).

Bolan, drawing attention to weaknesses of this sort, and the immense variability in the decision-making environments in which planning is carried out, comments as follows:

Most planners, in accounting for these differences, have not thought through alternative planning strategies or 'styles'. Instead they have tried to develop alternative ways of selling comprehensive or 'master' planning. Planning method has not adjusted and adapted to circumstances; instead the ways of imposing the classical ideal have been altered. Accompanying this is the usual wishful thinking that some day, given enough time and education, circumstances will change and the classical ideal will come into its own - even though more careful examination could reveal that the classical ideal might never be appropriate to present or future circumstances.  
(Bolan: 1967:235)

Planners deferent to the synoptic ideal are likely to see themselves as the guardians of the public good, which they attempt to realise not so much by the coercion of other parts and their relations, but by an omniscient appreciation of the state of the whole system under consideration that will allow them to calculate optimal solutions. This typically entails a heavy emphasis on capacities for gathering, storing centralised data - the development of powerful centralised data systems, macroscopic cost-benefit analyses, intensive forward programming, and so forth. Another emergent manifestation of the ideal is the design of all-embracing schemes for living in the year 2000 (or some other equally arbitrary date) which lack the self-honesty of utopian visions by appearing in the spurious garb of scientific statement.

We may say of the active maladaptations in general that they are capable of bolstering existing organisational patterns and

processes and fending off the emerging turbulence in the short run. There is usually some slack to be taken up in the degree of effective co-ordination among major organisational elements, so that for a while tightening the links that tie them together may enhance survival prospects. Similarly, big impressions can be made and ultimate confrontations postponed by large-scale and conspicuous efforts, such as the Anti-poverty campaign, addressed to the more tangible and visible societal problems. When organised planning persists with such strategies however, it is likely to be appreciated too late when the surrounding world has become transformed.<sup>6</sup> I have indicated the direction of transformation is towards a world requiring greater sensitivity to far more complicated environments, much speedier reaction times, and the ability to collaborate successively with changing configurations of other elements of the field. Institutions which have concentrated on self-aggrandisement, monopolistic practices, centralised, bureaucratic and mechanistic forms of management, and the preservation of the status quo by the accumulation of power, are likely to find themselves outflanked by the heteronomous processes of the turbulent environment.

## NOTES TO CHAPTER VII

- 1 This necessarily perfunctory exposition concentrates upon the main ideas and events that have shaped city planning in Britain and America.
- 2 See Rodwin (1956) for a good historical appraisal of the garden city idea and its impact on the British New Towns policy.
- 3 For an exception, see Hill's (1971) study of the company development programme and new management philosophy of Shell U.K. Ltd.
- 4 Jane Jacobs (1962) is particularly insightful on the myths of environmental determinism and the relative independence of social structure from physical conditions.
- 5 Alinsky's 'Reveille for radicals' (1946) is a timeless statement of the values and purposes of communal organisation - 'Peoples Organisations' - for promoting community welfare and development.
- 6 See the examples of the British Canning Company and the National Farmers Union discussed in Emery and Trist (1965). Also, recent discussions of similar problems by Blackler and Brown (1980) of Shell's "New Philosophy of Management".

**CHAPTER VIII**

**STRATEGIC PLANNING: A NEW PARADIGM**

The problems of the metropolis are enormous and pressing, and with the phenomenal rates of urban growth reliably expected, become more critical with each year that passes. Already, vast amounts of money are being expended on urban renewal, housing programmes, urban freeways, transportation studies, anti-poverty programmes, new towns and cities, and so forth. Many planners and others who have identified the symptoms of turbulence are already engaged in search and debate directed towards finding strategies for coming to terms with rapid and uneven change and its unpredictable consequences. The intention here is not to review the lines of search that are currently being pursued (although a number of them are referred to), or to advance a set of solutions for planning in a turbulent environment. It is to propose a new paradigm for planning that better comprehends the emergent over-complexity of the planner's world, and in so doing suggest some new perspectives on the nature of the problems to be overcome.

Susanne Langer begins her exploration of philosophy's 'new key' with the observation that "the technique, or treatment, of a problem begins with its first expression as a question. The way a question is asked limits and disposes the way in which an answer to it - right or wrong - may be given" (Langer: 1963:3). Insofar as the concepts that have been developed to talk about cities and city planning are the product of the industrial age, they are likely to be in need of revision when the phenomena that they describe are becoming part of a post-industrial world.

It becomes necessary therefore, to spell out some newly emerging concepts of the city, of planning, and of the role of the city planner. The retention in thought of concepts rendered obsolete by the changes that have taken place in society constitutes a substantial barrier to the right questions being asked, and retards progress towards appropriate responses.

This has been very much the case, as I have suggested, with city planning. For decision-makers employing the conceptual apparatus of industrial society, the appearance of greater and greater amounts of novelty and unpredictability in the social environment is likely to be perceived as a problem which demands the augmentation of existing capacities and the mobilisation of further resources. Planners ask how they can become better, more expert at their tasks - with what tools can they enhance their existing capabilities? How can they plan? And once these objectives are known, how can the best means for attaining them be found?

When it is believed that the relevant uncertainties are such as may be overcome by increased organisational efforts, solutions will be sought through acquiring more powerful systems for information gathering, data storage and analysis, model-building and simulation. For others, the significant uncertainties may be thought to stem not from shortages of information or inadequate calculative capacity, but from the inappropriate distribution of land uses - the haphazard interrelations of industry, commerce, residence and recreation, and the physical deterioration of parts of this urban plant. Such people would

seek to regain control at the wheel of the bulldozer and the replacement of the entire urban plant over the next 30 years. Others, again, see the extension of uncertainties as a reflection of the multiplication and fragmentation of authorities, and the answer to the problem thus conceived is a drive for greater agency co-ordination.

All the indications are that coping with turbulence will require a substantial conceptual leap, and that this constitutes a far more decisive condition than the application of special mechanisms of control. It is not simply new concepts that are needed, however, for there is ample evidence that individually, promising new concepts can be assimilated into existing thought-ways and emasculated of their power to reorder perceptions. Empiricist writings have managed to make the Marxian concept of class a dogsbody concept. If new concepts are to survive and to effectively promote new frames of reference, they must draw their strength from a network of concepts, and from conceptual rather than simply empirical definition. What I am concerned with then is a new paradigm (Kuhn) - the contextualist frame of reference - which offers not simply an alternative language, but also a fresh vision, a new appreciative system.

Many of the elements of this new paradigm I have already referred to, but they must now be drawn together. The direction of the shift is from closed to open systems, and from open systems to the fields in which aggregates of open systems interact; from a strictly physical to a geo-behavioural concept

of space, which is more fluid and subjectively determined. It represents the transition from a vertical to a horizontal cosmology, and a surrendering of the belief that with enough power and patience, one might always push analysis to the bottom of things, so that a more pragmatic world view, from which it is understood that solutions may be approached, but not achieved. Thus it should be possible to seek to understand problems and difficulties and to connect them in terms of more inclusive contexts. The accompanying movement in the aim and techniques of enquiry is from the making of explanations which derive from the analytical decomposition of linear causal trains (the 'normal' approach of science) to the developing of understanding which is derived from the exploration of field determinations. This amounts to an epistemological shift from a pronounced objectivity to a more subjective understanding.

The new paradigm breaks away from the presumption of an inherently orderly universe, in which individuals pursue goals within an essentially stable framework of objects and structures, and substitutes instead a universe in which change and novelty are central features, and behaviour is a continuous, interactive process, the directions and outcomes of which are shaped equally by the properties of the individual and of his/her environment. Such degrees of structure and stability as exist are properties of the field itself, and not of its parts or elements.

The implications of this contextualist frame of reference for the way in which planning is understood and carried out, and the

contrasts with existing modes, I consider in the following sections, but I will summarise them at this point. The underlying grid, and the key reference points for urban planners have been geographical and territorial - producing cognitive maps in which physical spaces and movements represent the essential parameters. Within this game, planning has become a process of 'tooling up' for the construction of large living machines - 'urban capsules', with efficient and economic environmental controls, in which urban man can do his educating, working, playing and resting; "tooling up", because it has characteristically stopped short of designing and facilitating the process of living itself. The social structure and social pathologies or urbanism have invariably been a lagged function of the built environment.

The planner has operated outwards in space and forward in time from the existing conditions of the physical, territorial city, modifying his practices as attention shifts from the dense core of the business district to the scattered peripheral suburbs and back again to redevelop the core, and as the shape of the future with which his planning has to be correlated becomes more and more uncertain. The formal planning commission has become the major instrument, deploying its expert technicians and policy advisers to control growth and development on behalf of the whole. Rising uncertainty and unpredictability have evoked an emphasis on rational, legal, and bureaucratic means of control - on the importance of planning ordinances and formally enunciated contracts and constitutions in restricting the activities of powerful organisations, legally defining their fixed reciprocal obligations.

The new paradigm proposes a new set of non-territorial units for the fundamental mapping of the planning realm, built of behavioural complexes incorporating concepts of social and psychological, (in addition to physical) space. This makes it possible to overstep the rather clumsy proposal to ameliorate the consequences of physical planning by supplementing it with 'social planning'. This distinction is lost when attention shifts to the social field, behaviour settings and the life space, and the units of analysis become occurrences in the sociosphere.

The synthetic and dispersive bias of the contextualist world hypothesis makes it possible to think in terms of a reversal of the planning process - to plan inwards from the field, and backwards from a vision of the future. To begin planning in other words, not from the extant city, but from the region of which it is a part, not from the immediately given goals and noxiants, but from a conception of a position in the future from which actions may be decided upon by 'backward determine'. In such a context planners may have to be identified in terms of what they are and what they do, rather than by their membership of a particular organisation or the possession of certain qualifications. Their personal qualities come to rank with the power and status of the planning commission when the environment for action calls for the creation of visions, and the regulation of complexity through the formation and negotiation of shared values.

From 'City' to 'Urban field'

In the framework of the politics and planning of the industrial era, the city has been regarded as a geographic, economic and political entity, standing out as an island of concentrated population and economic activities in the pristine rural-agricultural realm. The geographic frame of reference is concerned with topographical situation and the different ways in which land may be used, leading to a concept of the city as a spatial distribution of land uses and prompting investigations, of the relations between such area patterns and other geographic features such as drainage systems, geomorphology, soils and so on. This merges with the economic image of the city, as a centre of production and distribution of goods and services, with a regional sphere of influence determined by such factors as the availability of raw materials and labour and the quality of the communication linkages with the other centres.

Politically, the city has emerged as a separate area of government and administrative responsibility, demarcated from its surrounding hinterland by precise, legally constituted boundaries which delimit (and therefore constrain) in an important way the carrying out of governmental and administrative functions, including planning.

The rather rigid 'town and country', 'rural-urban' dichotomies in terms of which problems have been identified and policies worked out have been placed under an accumulating strain; to the point that their retention can now seriously inhibit progress towards improving the quality of life of both urban and

non-urban dwellers. It may be said that within America at least, a revolution is occurring which is unhitching the social processes of urbanisation from the locationally fixed city and region. Reflecting the current explosion in science and technology, employment is further shifting from the production of goods to services; increasing ease of transportation and communication is dissolving spatial barriers to social intercourse. A new kind of large-scale urban society is emerging that is increasingly independent of the city (Webber: 1970). In turn, the problems of the city generated by early industrialisation are being supplanted by a new array different in kind.

The traditional idea of the city fails to apprehend the new dimensions of urban aggregations, the reality of which is now generally recognised. Vickers comments, in typically succinct style:

...the conception of the city itself, as an entity bounded and supported by the basic rural world, seems to be dissolving, giving place to the concept of urban space, extending indefinitely, within which social and political divisions may have no more natural validity than the frontiers which colonial powers left behind in Africa.  
(Vickers: 1970:40)

Recognising the poor 'fit' of an existing concept is an important first step, preparing the way for the more difficult task of formulating a new concept that better articulates the phenomena to be understood. In this thesis I have developed the skeleton of a new frame of reference in adopting the concepts of the social field and the sociosphere, and I have attempted to trace strands of meaning from planning to them,

rather than to the concepts of society and social structure. I will extend this framework further by thinking of cities as regions in which the sociosphere is relatively concentrated, standing in contrast to regions in which it is thinly spread or diffused. The basic considerations then become the degree of concentration of purposeful social activities and the extensiveness of their influences. The concept of Urban field (Friedmann and Miller: 1965) expresses very well this conception of urban phenomenon. Within this, the inherited form of the city no longer corresponds to reality. The spatial structure of contemporary civilizations consists of metropolitan core regions and the intermetropolitan peripheries. The former have achieved very high levels of economic and cultural development at the expense of the latter, leaving the periphery in a decadent state. Current and projected trends in technology and tastes suggest that the urban field, a new element of spatial order, is coming into being which will unify both core and periphery with a single matrix.

The older established centres, together with the intermetropolitan peripheries that envelop them, will constitute the new ecological unit of America's post-industrial society that will replace traditional concepts of the city and the metropolis. This basic element of the emerging spatial order we shall call the urban field.  
(Friedmann and Miller: 1965:312,313)

The two major forces underlying the emergence of 'urban fields' in America are continued demographic concentration in the established metropolitan core areas, and a number of centrifugal forces pressuring towards the reintegration of the peripheral areas as resource bases and activity centres. Its space, scenery, relative ease of travel and cheapness of land,

historical assets and so forth, make the intermetropolitan periphery increasingly popular for such activities as recreation, the location of high-land-use institutions, the establishment of new towns and specialised communities catering for retirement, vacations and cultural activities, and economic activities which are either space-extensive or which do not depend upon intimate contact with large population concentrations (airports, agrobusiness, mail-order houses, insurance companies and warehouses).

Friedmann and Miller identify 70 potential urban fields in the United States, constituted of a core area of at least 300,000 inhabitants and having a radius of approximately 160 km. A population of around 300,000 is held to be the point at which distinctively metropolitan characteristics emerge, while the distance of 160 km from the centre represents the approximate geographic limit for commuting to a job and the limit for intensive weekend and seasonal use of the periphery for recreation. The urban field thus transcends the town and country, urban and rural dichotomy, suggesting that any sharp distinctions of this sort have become relatively meaningless from an economic or sociological standpoint in the urbanised society. Thus, the corresponding view of the city is no longer of a physical entity, but of a pattern of point locations and connecting flows of people, information, money and commodities.

The ideas of the urban field is based on the criterion of interdependency: "To define this region on a map, the main criterion should be that exchange relations within each field

are more intensive than among them" (Friedmann and Miller: 1965:315).

The concept of urban field, together with the social field and the sociosphere, belongs to the field-theoretic, contextualist framework. The resultant notion of "field planning" directs attention beyond concern with the physical urban plant and the social structure of the city, and the way in which these separate systems interact, by incorporating concepts of perceptual and behavioural space as well as the more readily understandable physical time-space co-ordinates. Further, the field notion points to the continuity of planning as a system of decision-making that extends in time both backward (existing possibilities are conditioned by all past decisions) and forward (present decisions influence future decisions both by changing the shape of the world and by establishing new precedents).

We thus come to a new appreciation of the metropolitan crisis - as a crisis over finding ways in which to cope adaptively with turbulent urban fields. The crisis, in other words, is one brought about by a qualitative change in the character of urban areas, which, in order to be met effectively, requires qualitatively different responses. The turbulence lies in the ecologically-connected patterns of activity, and needs to be approached in ecological terms.

The concept of urban field by itself provides a valuable new perspective. By itself however, it is a fragile innovation, and could easily become fashionable in the literature without

challenging established perceptions of the phenomena to which it alludes. Planning activities below the level of overall strategic planning for metropolitan regions must typically focus on parts and not the whole of the field, and an analogous shift is needed from concepts that have been used to distinguish spatially the different parts of the city to concepts referring to component zones of activity. It is now quite widely appreciated that the neighbourhood concept no longer corresponds, (if it ever did), with patterns of family and friendship interaction and the uses that are made of urban amenities and resources. The primary referent of other notions, such as the suburb, district, and 'territorial unit', is similarly locational and spatial, and they are more suited to describing the divisions of cities than the purposeful groupings within urban fields.

#### The Community

It seems far more appropriate to consider communities as the units of the urban field to which planning should be oriented, and abandon the administrative, areal, and pseudo-sociological distinctions to which planners have deferred. Community is not, therefore, to be thought of as necessarily a territorial unit, although of course it may be.

A community may be defined then as a social organisation that is territorially localised and within which people satisfy most of their daily needs and deal with most of their common problems. Members cooperate to provide, use and maintain the resources

that enable them to pursue the satisfaction of these needs and resolution of these problems. Thus, associations and interest groups, clubs, unions and professional bodies, as well as the residential locality, may be, or can become, communities. To regard communities in this sense as units for planning may further liberate traditional notions of the processes of planning and politics from preoccupation with fixed geographical areas, and encourage in its place a 'multi-faceted' conception of planning with numerous overlapping communities, and a non-territorial conception of democracy.

Conventional frameworks for the management and planning of cities move from metropolitan area to city area, district, suburb and neighbourhood, and thence to families and individuals as the units of administration. The emphasis is then on providing homes and amenities for families and understanding patterns of 'household activities', and providing jobs, school places, buses, and so on, for individuals. The unit at this level in the new paradigm is the behaviour setting.

In the course of their intensive investigation of the socio-physical dynamics of behaviour in the real world community context of 'Midwest', Barker and Wright made a 'discovery' that was obvious to native Midwesterners - "that behaviour comes not only in particle form, but in extra-individual wave patterns that are as visible and invariant as the pools and rapids in Slough Creek west of town. The Presbyterian worship services, the high school basketball games, and the post office, for example, persist year after year with their unique configur-

ations of behaviour, despite constant changes in the persons involved" (Barker and Wright: 1955:7). They noted that these 'standard behaviour patterns' were attached to particular place-thing-time constellations, the non-psychological context or milieu, and that there was a 'perceived fittingness' (synomorphism) between the patterns of behaviour and this milieu. They further observed that these behaviour-milieu units, which they came to call behaviour settings, were quite ubiquitous, in that very little behaviour in Midwest occurred outside their limits, and that there were often abrupt and usually noticeable changes in the behaviour of a person as he left one behaviour setting and entered another.

The discovery of these standard behaviour patterns they saw as crucial in identifying a community unit suitable to their purposes. While the general characteristics of the dividing conditions and behaviour of a community may be described by adding together the behaviour characteristics of the dividing conditions and behaviour of community may be described by adding together the behaviour characteristics and situations of representative individuals, it seemed clear to Barker & Wright that these patterned features of behaviour which can be seen directly should not be ignored.

In considering the value of taking behaviour settings as the units for understanding community behaviours I shall summarise them as follows:

**Visibility:** behaviour settings are prominent features of extra-individual behaviour identified with a high degree of agreement by observers.

**Phenomenal character:** they are features of the phenomenal worlds of both laymen and scientists, and a description of the community in terms of behaviour corresponds to common experience.

**Internal dynamics:** behaviour settings involve persons, non-psychological milieu, and behaviours in an interacting field of forces. Behaviour settings coerce behaviour and vice versa.

**Comprehensiveness:** behaviour patterns blanket the community. (In Midwest, Barker & Wright estimated that 95 per cent of all behaviour occurred within the behaviour settings they identified).

**Variety of attributes:** behaviour settings have many discriminable behavioural and non-behavioural characteristics. As such, they are rich material for analysis.

**External dynamics:** behaviour settings are not independent community units, and the pattern of one setting is often radically changed by the behaviour occurring in another behaviour setting.

**Theoretical position:** behaviour settings are empirical facts. They can be demonstrated, and their internal structure and

dynamics and their external relations suggest that they can be profitably conceptualised and incorporated into productive theory.

They will be incorporated into my conceptual schemes. The evidence is that the quality of a person's primary social world is very much a function of the availability and the quality of the behaviour settings. While planners and architects have talked a good deal about 'activity systems', most attempts to translate such notions into planning actions have lacked theoretical insight. In particular, the 'non-psychological milieu' has been treated as an independent variable, assumed somehow to give rise to the desired social liveliness and interaction, while Barker and Wright state quite clearly that standing behaviour patterns are shaped equally by the properties of the actors and the milieu (See above).

To orient planning in the community towards the needs of the household as the basic unit may be conducive to the functional and efficient provision of the structures and amenities necessary for family life. To visualise the community as an overlapping net of behaviour settings, actual and potential, makes possible a new perspective on the tasks of planning, in which the meaning and value of the community life is not sought in a behaviourally - random geographical area and the facilities it contains, but consciously located in the opportunities and variety provided in such supra-individual settings, in which people may experience the involvements and identity that tie them into the wider field. When, for example, the citizens of

Canberra, Australia, bemoan as they have done for years, the city's lack of a 'soul', the lacuna that they identify, more particularly in the outlying suburbs, is the poverty of behaviour settings in which Canberrites might come to know one another and with which they might achieve some stabilising identity. Each neighbourhood has carefully calculated areas of open space and playing fields, and square metres of retail space, and the inevitable primary school and filling station (budgeted for as the normal basic community requirements). What such neighbourhoods lack are the behaviour settings of a local tavern or milk bar, through which the neighbourhood might become a community. If the electronic age is tending to destroy the neighbourhood, effective planning could do much to restore it.

In the conceptual series of the conventional framework, the more basic unit, (the atom from which the family neighbourhood and city are compounded), is the individual; in the new paradigm it is the life-space. The person moves through a succession of behaviour settings in a continuous stream of behaviour that changes both himself and the settings in which he engages. The behaviour settings in a community should be such as to collectively provide each unique member of the community with the opportunities to learn more about himself and the community, opportunities for self-expression, and a certain level of support and recognition. There is, of course, no formula for bringing such a state of affairs into existence, but a start may be made by abandoning (or at least suppressing) the physical-territorial segmentation of the city as a basis for improving the quality of life, and organising efforts around a better

understanding of the dynamics of the life-space and the behaviour setting.

I arrive, therefore, at a suggestive alternative to the conceptual grid of the traditional city planners. In the new framework, dynamic processes and behaviours move to the foreground - processes take precedence over spaces and structures.

To summarise to this point, I shall draw up a table for the comparison of conventional approaches and the new approach suggested by my paradigm.

(Society, Social Structure)	(Sociosphere)
Metropolis, city	urban field
Suburb, neighbourhood	community
Household	behaviour setting
Individual	life-space

On the one hand, the elements considered by conventional planners discussed to this point are the metropolis, the suburb, the household and the individual. Such elements have been useful, but as I have elaborated in the earlier chapters, they do not take us far enough; they are epistemologically limiting. On the other hand, the urban field, the community, the behaviour setting and the life space, give us the notion of process of a dynamic interaction among the elements in an ever evolving contextualism.

As has been stressed earlier, the new concepts are not simply definitional equivalents, but belong to a new frame of reference in which the basic data are not elements or factors that are part of an inherently determinate cosmos, but contexts of complexes which continuously cohere and disperse.

Feibleman and Friend (1945) maintain that for the purposes of the structural analysis of wholes, three system levels are required - the whole from which analysis starts and the two levels below this. While there is an intuitive appeal in the idea that three levels are needed, there also seems to be a case for arguing that one of these be the level above the focal system. Thus, for example, the community is to be understood in terms of its 'location' in the urban field, and the behaviour settings that it comprises. If the urban field itself is to be taken as the unit whole, it may be that the sociosphere can be taken as the next higher level. The implication for planning is that intervention at any of these levels must be sensitive to, and take into account, the adjacent levels.

#### From Mobilisation of Power to the Institutionalisation of Values

To see the problem of city planning not as solving the 'urban crisis' but of finding ways in which social aggregates may adapt to the conditions of a turbulent urban field, suggests search in the direction that I have previously indicated - towards modes of ecological adaptation and the identification and institutionalisation of common values. In discussing the active and passive maladaptations to turbulence, it has become clear

that appropriate responses must take as their starting condition the full complexity and uncertainty of the environment, and that appropriate strategies do not include courses of action designed to strengthen systems of power and control when the field as a whole is in motion, long run stability is not to be attained by segregating the field into presently 'manageable' parts or by amplifying the power of its elements.

In terms of my value system, the answer is to be sought in the emergence and spread of shared values which embody the most important meanings and aspirations of all the actors and become part of the boundary conditions of their individual actions. In explaining this I shall refer to other writers who have profounded the same idea. A good example is to be found in Elting Morison's (1966) study of coping with technological innovation, in which he confronts the question: 'How then can we find the means to accept with less pain to ourselves and less damage to our social organisation the dislocations in our society that are produced by innovation?'

Morison suggests that in studying innovation we look into the possibility that any group exists for any purpose, for example, the family, the factory, the educational institution, and that this group might define for itself its grand object and see to it that the grand object is communicated to every member of the group. Thus defined and communicated, it might serve as a unifying agent against the disruptive local allegiances of the inevitable smaller elements that compose any group. It may also serve to increase the acceptability of any change that would assist in the more efficient achievement of the grand object.

Many of the processes studied by sociologists, such as group formation, institutionalisation, professionalisation, and so on, are concerned with the subordination of individual differences to the norms, values, and shared definitions of the situation that constitute the sub-culture of the collectivity and facilitate predictability of behaviour.

The reasons for re-emphasising and exploring further the role of values as a response to the present metropolitan turmoil are to be found in the ominously-widening gap between the transformation of the material environment through technological innovation and the rate at which this novelty is being absorbed in the cultural or appreciative systems of the social field. Our cultural-symbolic interpretations of the universe have lagged behind its material transformation, to the point that the natural distillation and change of meanings requires to be supplemented by the active search for, and dissemination of, new belief and value systems. The most fundamental difficulties seem to be the sheer scale of the field over which new values need to be communicated and absorbed; the considerable resistance of many social scientists and other professionals and practitioners to identifying themselves with and committing themselves to particular values, and of course, the resistance offered by existing values.

Values have the nature not of regulators and sanctioners, imposing specific demands and coercing particular courses of action, but of field forces which have the capacity of inducing coherence and co-ordination by providing parameters for the

adaptive behaviours of the numerous discrete parts of the field. Value formation does not, therefore, reduce the turbulent environment to a simple disturbed-reactive environment in which institutional capabilities are determinative of field regulation, but to a modified form of this, in which scattered and unpredictable behaviours become organised behind commonly acknowledged and professed sets of beliefs and values. The central requirements for particular values to assume this organising role seem to be, firstly, that the chosen values accurately reflect the psychic dispositions and basic cultural bonds operative in the given field, and that they are diffused by processes of exemplification, mutual explorations and democratic agreements, rather than by authoritarian injunctions and covert propaganda.

In searching for the sorts of values that might serve to bring a degree of coherence and predictability to the environments of present urban communities, the choice is not so hopelessly open-ended as it might first appear. Emery has drawn attention to a basic choice of 'design principle' that states the broad alternatives for organised social groupings facing changing and uncertain environments: "the choice is between whether a population seeks to enhance its chances of survival by strengthening and elaborating special social mechanisms of control or by increasing the adaptiveness of its individual members" (Emery and Trist: 1972:71). To cope with a changing environment, any adaptive, self-regulating system must have a degree of redundancy built into it - it must have parts or functions that are not called upon all the time, but which can

be brought into action when changes in the environment so demand. In human systems, to opt for the redundancy of parts means treating individual members as substitutable and replaceable, and requires a hierarchy of controlling parts within the system to make decisions concerning the parts at lower levels that are to be active or redundant for the purposes of a particular response. The factories of the industrial revolution and the armies of the First World War were systems of this kind. For a social system to seek the necessary variety by having redundancy of functions on the other hand, entails having individual members who have multiple skills and requires some mechanism for setting and shifting the configurations of these functions that constitute appropriate responses to changing environmental demands.

This choice of basic principle is equivalent to that between structuring communities as homogeneous or heterogeneous systems, as systems which decrease or increase the variety of the behaviour of parts. I have argued already that the former alternatives, of tightening control and co-ordination, are not likely to be adaptive under turbulent conditions for the field as a whole, while the latter alternatives tend better to reflect western democratic ideals. It would seem, therefore, that planning within the urban field ought to be premised on acknowledging that the constituent units of the field are heterogenous systems and the recognition that large and complex social aggregates can achieve a higher degree of overall adaptivity, by loosening up all the connections among their parts and fitting them, as far as possible, to cope separately with the turbulence in their immediate environments.

Unfortunately, there is little empirical evidence to support such an assertion. Nevertheless, within systems theory, which continues to have some force within the European industrial setting, a number of job redesign experiments have been set up with some success under this assumption.

The loosening of interconnections within the aggregate and the placing of the emphasis on the adaptability of individual parts are of themselves preconditions for centrifugal movement and disintegration. The most obvious and effective counter to such tendencies is the inculcation and dissemination of values and ideals, self-consciously arrived at and agreed upon by the main actors.

The meaning of this strategy of individuation of parts, and maintenance of the adaptivity of the whole through shared values, may be better appreciated by considering an extreme example - the engagement of opposing infantry forces in the battlefield. While the initial long-distance manoeuvrings and preparations are best governed by the normal authority apparatus of military organisations, there comes a point in closing with the enemy when 'every man for himself' is a far more adaptive strategy. The environment of hand-to-hand fighting is a radical transformation in the direction of greater uncertainty and unpredictability, which can best be met by the abandoning of the normal command pyramid and increasing each individual's area of discretion in choosing his actions. When individuals are thus loosened from the authority structure to which they normally respond, the effectiveness of their joint actions becomes, to

some extent, a measure of the degree to which they share common values and understandings and the strength with which they are committed to them. This combination of the physical independence and value consonance of parts has long been appreciated by the strategists of underground organisations and guerrilla forces concerned with survival in highly uncertain and hostile environments. It seems reasonable to suggest that city planners may have more to learn from them than from the 'new utopians'.

The suggestion is that the planning and development of adaptive communities within the context of a turbulent urban field may be furthered by defining the community itself as an organisation with the function of serving the ends and needs of its members, and working towards enhancing the adaptive capabilities of these members rather than building up and consolidating the 'fire-power' of the whole. This means that all the resources within the community, including the resources available for planning, should be regarded as instruments for the pursuit of individual purposes and ideals to which all members have equal rights of access. To the extent that the community as a whole needs to anticipate and take decisions in advance of changing external circumstances, its individual members need to learn the meaning of planning. To the extent that the purposeful parts of the community are enabled to adapt individually and to pursue their own purposes and ideals, there must be contemporaneous and collaborative search for values and unifying ideals that will provide a skeletal structure for the whole field of directly correlated behaviours.

This is not to advocate anarchy over control. The control in this instance will come from the ideals and values of the people involved in some kind of decision making. An underlying assumption of this thesis has been that members of communities are too often directed in every aspect of their lives, through monotonous work, authoritarian schooling, and dubious quality television and radio programmes. To involve people again in a proactive manner, requires that communities be involved with their members and that the community be involved in those decisions (such as urban planning) which reflect so markedly on their lives.

A conventional criticism (and source of despair) of the office-holders of traditional, professional planning commissions concerns the ignorance and indifference of the populations for which planning is undertaken.

Elaborately-prepared planning documents and diligently-organised public hearings fail to generate the expected responses and lead to charges of public apathy. Such charges may then be used to legitimise resorting mainly to professional standards and judgments in designing futures and policies for implementation. Such criticisms are naive, ignoring as they do the fact that planning activity involves a special sort of interest in, awareness of, and concern for larger systems and broader future horizons than the individual usually has to concern himself with, and which can only be acquired by doing planning. Only individuals who are given responsibility for planning can become imaginatively involved in planning's concerns; for those who are denied any such responsibility their involvement in the planning

process is likely to be restricted to some form of tokenism. The point has been provocatively argued by Churchman, who invites us to imagine a manager of the future reflecting upon the 'obvious' axioms of planning in 1968:

...This manager sees what no manager of today even suspects, that the whole 1968 planning process is predicated on the false and untenable position of serving the public's interest by means of expert representation. This old-fashioned assumption of 1968 is false because in reality the public's 'interest' is to plan, to mean something in the planning process, to become a master, not a servant, in planning the system.  
(Churchman: 1968c:76)

If communities are to reflect the needs and aspirations of the people they contain, then planning must be responsive to the purposes and ideals espoused by individuals and to the more general field values that are needed to regulate actions and interactions across the larger system, but planners have no special expertise in, or privileged access to, community values. In less troubled environments of past eras, when speed and appropriateness of responses, and accuracy and richness in the feedback of results, may have been less critical, the paternalistic gauging of the public good, the fairness but pedantry of the ballot box, the cumbersomeness of systems of 'representation', and the dubious scientism of surveys and questionnaires, may have provided sufficient articulation between planners and planned to avoid the gross accumulation of lags and the creation of ecological traps. The emergence of turbulence requires drastically shortened reaction times, multi-centred sensitivity to the environment and capabilities for continuous learning and adaptation. Such capabilities

cannot be monopolised by experts and special institutions, but by their nature need to be spread out across the field. This again has been Churchman's concern, in his attempt to demonstrate that the wisdom required for the regulation of society cannot be monopolised by any of its special parts. He suggests that we cannot assign the matter of judging a society and formulating policies for it to any kind of elite (Churchman: 1968b:65) be it scientific or managerial. The best answer that mankind has developed to the question "Who shall decide?" is not to be found either within political power or intellectual prowess. It lies in the concept of a well informed public. To take up Churchman's argument:

There are simply no 'experts' in the planning of human societies. The so-called experts know less about the planning of human society than does the public, because in each case the expert brings in a thoroughly biased viewpoint; on account of his expertise he is forced to concentrate on only one aspect of the living system. There seems to be no successful way in which the expert of large-scale systems can become a 'generalist'. There is no such thing as the 'universal man' in the area of the ethics of large scale systems. Therefore the need for a well-informed public is a true need. The underlying ethical principle here is that every man ought to feel that by his nature he can acquire knowledge about how society should be designed.

(Churchman: 1968b:65,83-84)

It may be that society cannot be planned but this has not stopped the elites to whom Churchman refers from trying. His point is that an informed public can prevent an undesirable alternative which reduces their quality of life from being imposed on them.

The direction of the change required is from planning for to planning with and planning by. More and more planners and

greater amounts of planning will be needed, but in environments in which stability is a function of value-sharing, planners will be less able to separate themselves from others and make decisions for them. If, as is argued in the following section, the process of planning is of more importance than the plan produced, the value of planning is heavily dependent upon the number of people who are engaged in the act. The degree of responsiveness that will be needed in future urban fields calls for the development of planning capabilities within communities and the capacity to co-operate as equal partners (co-planners) with 'outside' planning organisations. Preoccupation in recent planning literature with participation, choice, advocacy, and social planning seem to reflect a widening appreciation that some of planning's traditional concerns and modes of organisation have to be sacrificed if a meaningful engagement is to be achieved with the clients of the planning process.

The foregoing provides the barest framework within which the more particular interpretations and evaluations needed for the coming decades may be located. Numerous prophets and speculators, futurologists and social scientists have been bolder than this in offering their insights into the sorts of values that are already becoming (or may be expected to become) more salient as the cultural surround of post-industrial society responds to the structural transformations that have taken place and are continuing. It may be argued that whatever new values emerge they must be values which enhance our ability to cope with the increased levels of complexity, interdependence and uncertainty that characterise the turbulent contemporary

environment. The individual by himself, or indeed the organisation and even "the policy" by itself, cannot meet the demands of those more complex environments. A greater pooling of resources is required, more sharing, more trust, more cooperation. The inference may be drawn that appropriate emergent values will tend to be communal rather than individualistic. Their direction will be opposite to that which value-formation has taken in industrial societies, moulded as these have been by the Protestant Ethic.

In the following table, the key cultural values, organisational philosophies and government strategies persisting from industrialism with the emergent cultural patterns of post-industrialism are contrasted:

Cultural values	achievement self-control independence endurance of distress	self-actualisation self-expression interdependence capacity for job
Organisational philosophies	Mechanistic forms competitive relations  separate objectives own resources regarded as owned absolutely	organic forms collaborative relations linked objectives own resources regarded also as society's resources
Ecological strategies	responsive to crisis  specific measures  requiring consent  damping conflict  short planning horizon detailed central control small local government units  standardised administration	anticipative of crisis comprehensive measures requiring participation confronting conflict long planning horizon generalised cen- tral control enlarged local government units innovative administration

Planning: From Product to Process

If I may caricature the 'old' style of planning in order to contrast it with that which is emerging and needed, I may say that it tends to be reactive and remedial, that it is oriented to producing a plan rather than to the process of planning, that it venerates impartiality and rationality and maintains the separation of planning and action. The need for planning becomes obvious only with the appearance of crises and serious malfunctions, and responses are oriented to regaining the pre-existing state, or finding a new steady state, comparable to that which existed before the crisis. The main means for achieving this is to define the new steady state on a plan or series of plans which can be handed over to the decision-maker who decides if, when, and how they are to be 'implemented'. In the city, the classical expression of this form of planning is found in the powerful, quasi-independent planning commission, with its professional, qualified staff of planners, engineers, architects and so on, which functions as an advisory body, assisting government in policy-formation. Its view is comprehensive in that no aspect of community development is assumed to be beyond its responsibility. It is also comprehensive in the sense that the planning commission is the guardian of the whole public interest (Bolan: 1967). From this it is assumed that the planning commission is both capable and responsible for establishing long-term development goals which provide a broad perspective and give substance to short-term particularistic community decisions.

This sort of planning is more likely to be deferent to the synoptic ideal in policy-formulation and decision-making, and to seek its own improvement in becoming more 'rational' and more comprehensive.

In contrast to this, numerous emergent strands of planning thought are currently coalescing into an alternative image of the nature of planning activity which emphasises its future-oriented, prospective concern, stresses the importance of the process itself above the plans produced, acknowledges the permeation of the planner's world with values, and attempts to understand their dynamics, and seeks to break down the distinction between plans and their implementation. This new 'dynamic' image can be traced back to many roots, in business and city planning, in philosophical, economic and political writing, and is discussed under a variety of names - 'innovative', 'process', 'action', and 'adaptive planning'. Its flavour may best be appreciated by sampling the thought of some of its proponents.

Ackoff (1965, 1970a, 1970b) developed a concept of adaptive planning for organisations premised on the view that "...planning is not an act but a process, a process that has no natural conclusion or end point (1970a:3). A 'solution' can be approached but never fully accomplished, because there is no necessary limit to the amount of reviewing of previous decisions, and because both the system planned for and its environment undergo change during the planning, and it is never possible to take all such changes into account. Hence "a plan

is not the final product of the planning process; it is an interim report. It is a record of a complex set of interacting decisions which may be partitioned in many different ways"

(Ackoff: 1970a:5) Planning is defined as a process that involves making and evaluating each of a set of inter-related decisions before action is required, in a situation in which it is believed that unless action is taken a desired future state is not likely to occur, and that, if appropriate action is taken, the likelihood of a favourable outcome can be increased.

Adaptive planning entails taking into account the stylistic as well as the performance objectives of the organisation, and the value preferences of the participants, and seeks to reconcile these by "motivating participants in the system to act in a way that is compatible with the interests of the system as a whole ... by providing incentives that make individual and organisational objectives more compatible" (Ackoff: 1970a:20).

Adaptive planning for communities rather than corporations may have to take account of the purposes of the members in a different way, which appreciates that the parts of such systems are at a higher level than the system itself, but the conclusion - that the benefits of planning derive more from participation in the planning process than from the consumption of its product - remains valid.

Friedmann (1959, 1966, 1967, 1969) comments that "until a few years ago, discussions of planning were restricted to consideration of an abstract model of perfect rationality in social decision-making" (Friedmann: 1967:225). He interprets

planning as societal action, concerned with 'the guidance of change in a social system', and oversteps the disjunction between plan formation and plan implementation in drawing attention to the characteristics of 'action' and 'innovative' planning, and the changed environmental circumstances that are making these new modes obligatory. The new modes are dynamic and continuous. Any plan, given the contextualist approach of this thesis, is only a working paper, not a set number of fixed objectives. Thus it is of but momentary importance; by the time it is published in print it may already be out-of-date. The making of the plan, the exercise of plan related thinking is infinitely more important than a neatly published book entitled: six-year plan.

The widespread notion that planning and implementation are separable activities dies hard, while the belief that adequately communicated plans ought to get accepted and implemented rests, "on the technocratic fallacy that planner's proposals are inherently superior to actions that result from the unaided decisions of non-planners" (Friedmann: 1969:311).

Most forms of societal action are system-maintaining rather than system-transforming (revolution and counter-planning), and embrace two forms of planning - allocative and innovative planning. The former concerns the 'assignment of resource increments among competing uses' and exhibits strains towards comprehensiveness, system-wide balances, synthesis, and functional rationality. Innovative planning, on the other hand, is concerned with the mobilisation and organisation of resources

for new uses: "...the task of innovative planning is the institutionalisation of functions, roles, frameworks, and performance programs that were not previously part of an organisation's repertory" (Friedmann: 1969:312). Elsewhere he has put forward four defining characteristics. Innovative planning may be defined in terms of four characteristics:

1. It seeks to legitimise new social objectives or to accomplish a major realignment of those already existing;
2. is concerned with the translation of general value propositions into new institutional arrangements and concrete action programs;
3. has greater interest in the mobilisation of resources than in their optimal allocation among competing uses;
4. proposes to guide the process of innovation and the consequent adjustments within the system through information feedback of the actual consequences of innovation.

This description makes it abundantly clear that innovative planning eschews the comprehensive plan in favour of strategic action. For communities living through a succession of continuing crises, innovative should be more prevalent than allocative planning. Indeed the need for innovation is among the imperative needs of an age which structural changes are the normal pattern and social equilibria may be considered fragile and short-lived.

Very similar conceptions have evolved among the leading thinkers in the domain of corporate planning, many of whom make explicit recognition of the fact that, just as for the metropolis, the transformation of corporate environments in the direction of greater complexity and unpredictability urgently demands new forms of planning behaviour. A brief review of just four such waters will make the point. According to Branch, for example, changes in the structure and organisation of finance, sales and distribution, industrial relations and research and development require an enhanced sensitivity to the environment and reduction of reaction times of business operations. The type of planning needed has the characteristic that 'the continuous application of the process is more important than any particular plan':

An understanding of the inherent open-endedness of planning, a coming to terms with the scientifically indeterminate environment within which it must operate, and the establishment of an effective *modus operandi* are required for successful planning in general and corporate planning in particular.

(Branch: 1962:40)

Beer attacks the tacit assumptions of the 'old' model of planning in the following terms:

There is no 'day of judgement', even notionally, against which to measure overall performance. This means that the pay-off for any set of plans is no criterion of optimality...the proposal is then, that managerial decisions implicit in any plan ought to be taken over and over again while the plan is unfolding; and that it is not enough to say (as managers do) that the plan 'ought to be flexible'. It sounds like a truism that planning must be a continuous process; and yet it is not in practice, and this is why plans - notoriously - 'do not work'.

(Beer: 1970:32)

In discussing the challenges to management science of long-range planning, Drucker has defined business planning as:

a continuous process of making present entrepreneurial decisions systematically and with best possible knowledge of their futurity, organising systematically the effort needed to carry out these decisions, and measuring the results of these decisions against expectations through organised systematic feedback.  
(Drucker: 1959:240)

With regard to city planning in particular, Mitchell concludes from his inspection of the 'new frontier in metropolitan planning' that the professionals will have to grow out of their 'static, handicraft, and largely intuitive methods':

Most planning today is static. It portrays a desired urban pattern at some future date. I believe the plans of the future will be plans for the nature, rate, quantity, and quality of urban change - for a process of development. They will be expressed in dynamic rather than static terms. They will start with present conditions and point the direction and rate of change.  
(Mitchell: 1961:171)

For planners who are having to operate in environments of extended size and complexity, and rapid and uneven change, solutions are not to be found in attempts to improve upon the weaknesses of the synoptic ideal or striving harder for optimisation in policy making, nor in the more obvious pathologies of artificially fragmenting the decision field. The direction of response required is from utopian to piece-meal social engineering (Pepper: 1945); from synoptic idealism to 'disjointed incrementalism' (Braybrooks and Lindblom: 1963), and, more generally perhaps, from optimising to adaptivising. A world view compatible with such a shift has to acknowledge that our systems for living can never be complete and in balance, but will always be unfinished and will experience strains and stresses. It requires the further appreciation that an extended

field confronted with turbulent conditions is able to improve upon its total development and adaptive potential by loosening the connections among the parts and enabling them by process of 'partisan mutual adjustment' to meet the uncertainties in each of their relevant environments.

Within the strategy of 'incrementalism', it appears that through various specific types of partisan mutual adjustment among the large number of individuals which comprise groups, there seems to be a diffuseness. Further, that among such groups analysis and policy-making may be fragmented. What is ignored, however, is that one point in policy-making becomes central at another point. Hence, it will often be possible to find a tolerable level of rationality in decision making when the process is viewed as a whole in its social or political context, even if at each individual policy making centre, analysis remains incomplete.

Of adaptive planning, we may say, therefore, that it is continuous, participative, value-laden, and future-oriented. Engaging constructively with the future and doing planning takes precedence over the creation of plans, which has a natural consequence that the more people who can be involved, the better planning can be expected to be. It is inherently concerned with values as facts and seeks to understand the way in which they change and interact with needs and means, rather than trying to separate values and facts into different phases of planning activity.

Adaptive planning responds to the difficulties of constructing a comprehensive evaluative method and the limitations of human problem-solving capabilities by rejecting the centralisation of power, control and decision-making, in favour of the devolution of initiative and the decomposition of problems into separate facets and successive stages. It aspires to a level of rationality in the achievements of the whole system that is consistent with the decentralisation of decision-making among the numerous purposeful sub-systems and the processes of mutual adjustment by which stable ecological patterns are evolved and maintained.

Adaptive planning seeks to inspire and to shape societal change, not by the construction of complete and final designs of the future or by bringing into existence special and massive problem-solving agencies to remedy particular dysfunctions, but through connected series of opportunistic interventions by the communities described here, or individuals concerned with improving their "life-space", in which the purposes accomplished have the character that they each contribute to progress towards a guiding ideal which supplies their rationale. The techniques for accomplishing change in this manner are resistant to categorisation, because they are more likely to issue from expediency than from rational calculation. They include a special sensitivity to the use of 'leverage points' - those parts of the field which are susceptible to change and from which the greatest rates of diffusion can be expected; the manipulation of incentives and inducements in the reconciliation of competing ends; the practice of generating resources,

(including, especially, human and organisational resources) as a worthy end in itself; and the use of experimental methods in searching for solutions, in which the extra costs incurred and risks involved have to be justified in terms of the guarantee of some result, positive or negative, that contributes to overall progress.

### A Methodology

Adaptive planning aims to overcome inadequacies of information and to improve upon its own performance by devising and employing techniques of action that generate information, and which make the maximum amount of learning possible. When it is successful it is continuously self-correcting, and provides a continuing education for those who are involved. In community planning, this means that some members must be involved from the beginning and throughout a phase of planning activity, so they may learn at least what the official planners learn, while both may learn more as a result of their interaction. Attempts to involve citizens at the blueprint stage, when a plan has been prepared and polished, must be expected to generate more antipathy than learning. Insofar as learning comes from self-help and practical experiences, it may be furthered in the community by making citizens responsible for conducting surveys, organising planning exhibitions and so on, and more importantly, for actually planning their own neighbourhoods. To the extent that more can be learnt from meeting conflicts and trying to resolve them than from suppressing or avoiding them, there are benefits to be gained from working out such conflicts in a

public forum. To go a step further, some elements of conflict may be deliberately introduced by the creation and formal sanctioning of a counter-planning system, to provide continuous criticism and promote alternatives. To the extent that learning rarely suffers from the making of mistakes, the community's own planners should be expected (and allowed) to make them, the benefits of the experience thus gained compensating for sub-optimal solutions in terms of professional design and implementation standards.

The long-run aim or ideal of the adaptive planner becomes, as Ackoff enigmatically suggests, his own obsolescence. The family succeeds in its historical and cultural mission not by providing its dependent members with all that they need and want, but by liberating them from itself through providing them with the adaptive capabilities to survive in other environments. Adaptive planning succeeds when its children become planners themselves, and parents are able to retire.

Because ours is an age dominated by technology in a time of prodigious technological change, we need to become, by one means or another, an "adaptive society", able to extract the fullest possible returns from the opportunities at hand and to build into the social field "the kind of resilience that will enable us to accept fully and easily the best promises of changing circumstances without losing our sense of continuity or our essential integrity" (Morison: 1966:42).

We are not, as yet, an emotionally adaptive society, though I think we try systematically to develop forces that tend to make

up one. We encourage the search for new inventions; and keep the mind stimulated, bright, and free to seek out fresh means of transport, communication, and energy; yet we remain, in part, appalled by the consequences of our ingenuity, and, too frequently, try to find security through the shoring up of ancient and irrelevant conventions, the extension of purely physical safeguards, or the delivery of decisions we ourselves should make into the keeping of superior authority like the state.

We should then, give some attention to the construction of a new view of ourselves as a society which in time of great change identified with the obtained security and satisfaction from the wise and creative accommodation to change itself. Such a view rests, I think, upon a relatively greater reverence for the mere process of living in a society than we possess today, and a relatively smaller respect for and attachment to any special product of a society, a product either as finite as a bathroom fixture or as conceptual as a fixed and final definition of our democracy.

#### The Planner's Role: From Master to Midwife

When the task of city planning is broadened from its preoccupation with the physical environment to encompass the ecological problems of the regulation of change in extended urban fields, and the strategic objectives for regulation is defined in terms of value-formation and institutionalisation, some important changes are implied for the role of the planner.

The concept of adaptive planning described in the preceding section invites one to think of the planner and organisations for planning as resources to be used by communities in their efforts to improve the quality of the community life. As the critical environmental processes in the action environment of the planner are the purposeful behaviours of people who are capable of directly correlating their own behaviours with what is done by planners, there can be no utility in trying to define or to prescribe the particular sorts of relations that should exist between planners and planned. Their interactions should be multiple, varied and changing, and always open to new possibilities.

The role of midwife suggests, however, that the respective contributions of planners and citizens to the planning process ought to be more a matter for joint determination, and not something that is decided unilaterally by the planners. Reflecting the climate of self-examination of the city planning profession, Rein (1969) suggests that the advent of 'social' planning to respectable status makes it necessary for the planner to search for new sources of legitimation. Their authority has been legitimised in the past in terms of:

expertise: planners are considered as scientific experts operating independently of the political process

bureaucratic position: the planners operate as the agents of elected political representatives

consumer preferences: the planners operate as the translators and advocates of user-group preferences

professional values: planners operate in terms of a preconceived notion of what planners consider relevant.

In terms of the framework discussed here, however, there would be an accumulating, almost world-wide pressure away from such legitimation towards participative democracy which places an added importance on defining planners' roles not only in terms of formal qualifications and bureaucratic position, but in terms of leadership, and visible ability to assist in the pursuit of community objectives and ideals.

It is suggested that planners might learn from (for example) successful ghetto leaders (Ackoff: 1970c) who survive not through the operation of the "Peter Principle", but by effectively serving their constituents and the larger community that contains them:

Without support of the larger community, ghetto leaders cannot get the resources and programs that they require to serve their constituents. Without serving their constituents they cannot retain any followers. Hence only effective leaders survive.... The ghetto leader has neither rank nor authority vested in him from above. Therefore, he cannot use these to get others to do what they do not want to do. He must know what his followers want, what they can be persuaded to do, and how he can persuade them to do it.

(Ackoff: 1970c:18)

To retain his position, the ghetto leader has to "deliver the goods", and to do this he has to rely on personal qualities and

a close and continuous sensitivity to the needs and moods of those whom he serves.

Obviously, professional planners need to acquire political and inter-personal skills if they are to play any significant part in urban development. If metropolitan problems are to be dealt with, it is up to the planner and his professional cohorts to develop strategies which will include not only physical and social change but also the building of coalitions among the holders of influence in urban areas." (Robinovitz: 1967:19). The skills required for discovering and formulating coalitions and maintaining alliances are, to varying degrees, the skills of the politician.

Friedmann (1966) has discussed the 'behaviour traits' of innovative planners and the ways in which these differ from the received image of the professional planner's role. Innovative planners become committed to their ideas, and are more concerned with justifying proposed solutions than with predicting their consequences. They become engaged, but not involved, in the political process, retaining a marginal, boundary position between planning and political systems that gives them influence in each, and treat information and co-operation as tactical ingredients in getting towards solutions rather than as ends in themselves. Finally, they show strong preference for experimental methods and pilot schemes in tackling difficult problems - a predisposition to learn by practical results rather than abstract 'trial-by-stimulation' which is so much in vogue. What stands out in this personality profile of

innovative planners is their commitment to ideas, their single-minded pursuit of a task, their political engagement, and their relative indifference to values other than those which bear specifically on their problems.

This recalls the observation of Wolfgang Mommsen that 'only a spiritual state that is basically attached to certain values by which the individual feels personally compelled, can supply the measure of energy requisite to break out from the confines of the everyday world and impart a new direction to its sluggish flow:  
(Friedmann: 1966:201)

The concern of this 'new breed' of action planners whose concerns are really 'trans-technical', and whose training ought to include the development of those personal skills that enable technical and analytical competencies to be put to the best use has not yet manifested itself. Yet, the action planner needs heightened self-knowledge, greater powers of empathy, and an increased capacity for learning ('...his effectiveness will often depend on his ability to learn from others and from the situation itself, and to rapidly integrate this learning with the knowledge he already possesses. This implies ...a willingness to learn, a humbleness when faced with new and possible disconcerting facts...') He needs to be capable of the skilful use of symbolic materials and to have an understanding of the dynamics of power and political processes. Finally, his word must be responsible. He is advocating points of view that will affect the lives and well-being of others. In action-planning then, the planner moves to the foreground as a person and autonomous agent. His success will in large measure depend on his skill in managing interpersonal relations. The

typical action environment is tense and charged with conflict. Consequently, the planner has to learn to live with conflict, to accept conflict as inevitable, and to exploit conflicting forces for constructive action. Only rarely will the planner have his way; he will have to bargain, compromise, and learn to accept defeat without being crushed by it.

Planners must become advocates acting on behalf of every kind of organised interest group (political parties, chambers of commerce, real estate boards, labour organisations, ad hoc protest associations, and, in particular, neighbourhood groups). This appeal is based on the view that planners need to become involved. The planner should do more than explicate the values underlying his prescriptions for courses of action (Davidoff: 1965). He should affirm them; he should be an advocate for what he deems proper.

We may note that as a major drawback to effective democratic planning 'the continuation of that non-responsible vestigial institution, the planning commission' (Davidoff: 1965:331), and proposes to substitute for its unitary planning a process of plural planning in which many groups create and defend plans with the help of advocate planners.

The advocate planner is responsible to his client group, on behalf of whom he engages in the planning process, and whose views he seeks to express - he pleads for his own and his client's view of the good society. He therefore devotes much time to assisting the client organisation in clarifying its

ideas and giving expression to them, but he is also occupied in informing other groups of the conditions, problems and outlook of the group he represents, and is responsible for the critical appraisal of the planning carried out by other groups.

These are some of the facets of any emerging image of the kind of planner who is needed to create and galvanise the resources required to tame the metropolis. It goes without saying that all existing technical and theoretical skills that enter into the planning process will continue to be fundamental, although they have not been considered here. Beyond this, the horizon is one of increasing diversity in the roles that planners will be playing.

The new conceptual mapping of the urban field I propose here suggests that the organisation of planning itself might benefit from becoming ordered to the structural levels of the urban field, instead of the functional and territorial divisions that are commonly used. The problem of the whole urban field is one of overall strategic planning, requiring co-ordination with developments in contiguous (and more distant) fields.

Alternative field structures and their implications as boundaries for the finer texture have to be spelt out. The involvement of the public here should come in the evolution of the philosophical basis of the structure, which could be argued out in many venues from a realistic (i.e. limited) number of genuine alternatives. Inevitably, some of the major forces shaping the structural alternatives are the dispositions and objectives of the dominant institutional complexes of

government, public and private enterprise; and planners operating at this level need to be able to relate themselves effectively to the institutional leaders from these domains and to negotiate a degree of congruence between the values represented in the planning process and those held by other institutions.

At the community level, the roles of leader and advocate become more salient, and more activities can be directed to giving expression to the preferred values. The community seems to be the critical level for efforts to reduce turbulence as it impacts upon family groups and individual lives. Organising community members behind values such as those built into Alinsky's "People's Organisations", or conservation, or anti-poverty, gives a structure to the field against which other choices and actions can be measured. Community planners should be in contact with the individuals and families, local organisations and interest groups, shopkeepers, lawyers, law enforcement officers and other functionaries in the community, and devote time to deliberately cultivating organisation with and amongst them, so that the planners' success may eventually be measured not by the amount and quality of the planning that they do, but the amount that they enable others to do.

It is doubtful whether there is much value in trying to rationally plan and create behaviour settings, as their quality and viability are as much the product of individual free expression and spontaneous interaction as of a definable milieu. They need to be nurtured permissively in the same way the

intelligent planners of institutional environs do not 'fix' and concretise footpaths until people have shown where they want to walk. If, at the level of the whole field, the planner's autonomy and responsibility are greatest, at the community level he becomes a collaborator and co-planner, in the 'creation' and maintenance of behaviour settings he plays his least obtrusive role - that of facilitator.

**CHAPTER IX**

**RECOMMENDATIONS AND IMPLEMENTATION**

In Chapter VIII, I attempted to draw together the threads of the thesis and from this I wish to develop a number of recommendations for future action. Finally to add a cautionary note, and some thoughts on implementation.

From the outset, this thesis has been premised on the notion that a new paradigm using a contextualist frame of reference which offers a new appreciative system is necessary if we are to make headway in dealing with environmental turbulence. Further, I have argued that the flight to increased organisational efforts to find solutions through acquiring more powerful systems for information gathering, data storage and analysis, model-building and simulation and so on, will not provide adequate outcomes.

Adaptability, at all levels of human affairs, is positively evaluated almost without exception. This gives to 'adaptive planning' and the notion of the 'adaptive society' a rather seductive appeal that must be guarded against. The point to be emphasized is that the adaptations urgently required are of the active and not the passive type. The indulgency of 'free fall' has taken us so close to the portals of a global trap that reacting to changed circumstances when they have become manifest is a luxury that cannot really be afforded. Active interventions are needed to overcome inertia in the massive system of technologically-dominated machinery, energy, institutions, and ideas of post-industrialising societies, in order to provide a widening array of meaningful alternatives in ways of living.

As has been argued consistently here this requires:

1. active involvement of individuals in order to regulate actions and interactions across the systems so that we do not allow society to be judged and have policies formulated for it by elites. This requires planning with and planning by the people themselves.
2. That planning be regarded as a process, in which the plan is seen as an initial step in the formulation of succeeding plans to bring about appropriate actions thereby increasing the likelihood of a favourable outcome. We move then, from a "comprehensive plan" to strategic planning. This I call adaptive planning.
3. The role of the planner must be changed from director to facilitator. The planner must be 'involved'.

How may such recommendations be implemented?

One readily available (but presently under-utilised) means from which a start may be made is the method of experimentation. Ways need to be found of building into society closer control over its own nature and direction, of giving its members more responsibility for participating and greater powers of choice, better evidence for judging alternatives, and more inspiring purposes and ideals by which to live. We might approach such tasks experimentally through the introduction of a massive expansion of the process of experimental demonstration

throughout all parts of the society to create the mood and means that will enable the members of the society to explore new instruments and new procedures by designed experiments while pondering alternatives and reserving judgement until the results are in.

The conditions governing such experiments, whether conducted with new machinery, new building designs, new manufacturing systems, new ideas for community organisation, are relatively simple and much the same in each case (Morison: 1966). In addition, in each area of interest there should be not one, but a good many different experiments of differing design so that a suitable array of alternative solutions could be offered. There should also be enough of them in all parts of our life to demonstrate that the society is proceeding, as a whole, in the mood of experiment.

Social experimentation needs to be operational rather than 'pure', requiring some measures of protection, but not those which would make experimentation artificial and abstracted from the realities of the social world. The relevance and value of social experimentation if small, is critically dependent upon its ability to encompass, in some manner, those real exigencies that have to be confronted in the post-experimental stage. It is, therefore, of the first importance that experimental sites be judiciously selected. They must be sites which offer conditions for conceptual protection in the design stage, experimental protection during the period in which changes are introduced and modified, and operational protection during the

transitional phase from experimental to normal operations (Trist et.al: 1963:225-6) Yet at the same time if the experiences are to be transferable they must not be protected to the point of unreality. From what basis then might experimentation in planning proceed - what would it be designed to accomplish?

The suggestion here is that such experimentation is more productively grounded on a conception of the 'solution' of end state to be aimed at than on the nature of the immediate threats, difficulties and disturbances that constitute the problem-solving situation. In terms of the normal thresholds of human and organisational adaptivity, the turbulent environment represents an 'overshoot' - a behaviour milieu characterised by degrees of complexity, uncertainty, connectivity and dynamism that make irrelevant the experiences gained in other environments, and make dangerous attempts to survive passively. Yet the forces that operate within the manageable, disturbed-reactive environment to produce turbulent conditions are so pervasive and so powerful that there can be no question of throwing them into reverse, thereby creating a path back from the Type IV to the Type III environment.

Massive and powerful institutions, government complexes and multinational corporate systems cannot now be dismantled into independent firms and bureaus, and there are no obvious gains from now reducing the speeds and capacities of the global communications net, or placing a moratorium on scientific research. Attempts to begin reducing the interdependence of the economic and other facets of society are, at least, equally

unfeasible. These are the forces behind the uneven acceleration of change, the growth in size, complexity, and interconnectedness of social fields, and they are forces that we should not deceive ourselves could be turned around, notwithstanding the convictions of the evangelist, the authoritarian, and the synoptic idealist to the contrary.

The solution from which we might backwardly (See Chapters 7 and 8) determine the content and design of the experiments that ought to be undertaken is not found, therefore, in the structure of the disturbed-reactive environment, to which there can be no return. We are concerned, rather, with a dialectical process, in which the disturbed-reactive environment represents the thesis, and the turbulent environment the antithesis. The synthesis, (and my solution) is not the disturbed-reactive environment again, but a modified form of it, which I have tentatively called a disturbed-creative environment. It is a modulated form of the turbulent environment, in which some of the character of the disturbed-reactive environment is reproduced.

Turbulence is generated by the pounding accumulation of competitive energies and forces which are predominantly divergent - single, self-seeking power centres each seeking to refashion the world in its own image, and deciding amongst competition, co-operation or coalition on the basis of power added. When these same forces become convergent, it is often unpredictable there having been no symptoms discernible with the aid of any existing instruments. The consequences of actions lead off everywhere and anywhere, with unexpected (and

unprepared-for) windfalls and traumas equally possible. What becomes necessary is to have greater potentialities for convergence built into the field - a rewiring of the loose ends of action consequences, to enhance the probabilities that they will converge and cohere into recognisable patterns, rather than working themselves out through attrition, or converging randomly to create contingencies that can neither be readily taken advantage of nor easily avoided.

To identify, plot and engender convergence out of such blooming, buzzing confusion is a task demanding creativity, and it is for this reason that we are inclined to refer to the modulated turbulent environment as disturbed-creative. It is still disturbed because the generating forces of turbulence cannot be eradicated. The creativity especially required, as previously suggested, is creativity in value-formation and dissemination - in other words, leadership. The potentialities for the deliberate creation of convergence and coherence out of the turbulently-connected field are a function of the quality of leadership in all the regions and at each level in the field, of the ability of some human beings to relate the unconnected, unite the dissident, and all the time imaginatively embrace the more and more inclusive systems of which they are part. The necessary rewiring is not something that may be accomplished technically or politically or educationally, or by any other system of power. It is something that has to be accomplished by the fragile instruments of men's minds, and their capacities to present and adhere to ideals to which the behaviours of multiple and diverse actors in the field may be directionally correlated.

Having identified the disturbed-creative environment as the 'solution', the question arises whether, in specific cases, it may be approached 'from below', from the simpler environments, through interventions in the evolutionary processes at the Type II and Type III levels. The appeal of this strategy is that it may, in some respects, be easier to guide the developmental forces in clustered and reactive environments so as to produce a demonstration case of the disturbed-creative field than to discover the kinds of interventions appropriate in the turbulent field to reduce its complexity. In the case of urban planning, the concrete terms of this possibility have to do with the kind of planning that is done in new communities.

New communities (estates, villages, towns, cities) embodying modernity in conception and design, and reflecting current or somewhat advanced notions of appropriate standards of living have become a salient feature of contemporary society and are much discussed in the planning literature. It is generally (but not always) appreciated that new communities in themselves can never provide an answer to the real problems of the large city. They syphon away minute and often privileged fractions of metropolitan populations, and in their novelty and physical attractiveness distract attention from the dominant urban sprawls. They have, however, been referred to, and appealed to, as sites in which experiments in planning might take place.

New urban growth comes in many different forms - garden cities and garden suburbs, model estates and villages, corridor expansion and new satellites for the metropolis. In such

contexts, planning may begin from a virgin, 'green fields' environment, or, as in town expansion schemes, from a more disurbed, though still relatively simple, environment. In cases where new towns are built on publicly owned land in particular, planning organisations occupy highly favourable positions vis-a -vis those in the large established cities. If the judgment is correct that a requirement for coming to terms with turbulent planning environments is new forms of more positive engagement between planners and other parts of the field, then the conclusion seems justified that the experience of creating new communities to date has been nowhere near as successful as it might have been.

These benign environments seem to have attracted some of the best planners with the promise of relatively early and very tangible results. Characteristically, however, they have used their protected positions to perfect the traditional modes of planning, and to develop new techniques, rather than experimenting with the planning process itself. Planners continue to differentiate hierarchically among their own capabilities, organising themselves into bureaucratic structures when these are demonstrably less responsive than organic and matrix forms of organisation. While there is much talk in new communities of 'social' planning, in fact planning usually continues to be organised around physical and spatial concepts, and reputations made on architectural not social achievements. The "Master Plan" is 'out' and 'participation' is 'in', but seldom with significant consequences. The 'strategic outline plan' is less dogmatic and more palatable to the planned, while

participation, as it is normally conceived, absorbs protest but fails to unleash new energies and enthusiasms. The community development officer often seems to be the product of the same type of thinking, which produces 'innovations' that will better maintain the status quo.

Canberra, the Australian national capital, provides a classic example of this kind of 'lost opportunity'. Constituted in 1957, the National Capital Development Commission has become a near perfect model of the traditional style of city planning. The organisation is powerful, efficient and impersonal, and its planning long range, comprehensive and authoritarian. With the land owned by the Commonwealth, and its use controlled by the planners through a leasehold system, Canberra's planners occupy a position that is the envy of their colleagues in the state capitals. They have used their powers to create a physically superb, but socially and politically dormant habitat, manifested in the pervasive 'we-them' mental set of Canberrites towards the Commission.

On the practically total lack of citizen involvement in the planning process, the Commission has, at least, been quite frank:

Although all avenues of disseminating information are pursued, there is no direct involvement of the public in the planning process. There has been little evidence of a desire for such involvement so far but it can be anticipated that a more educated public (sic) will seek more opportunities for dialogue before decisions are made. The Commission can see much value in dialogue on matters of 'municipal' concern. It has already conducted a number of surveys of attitudes and behaviour of people and is

proceeding with a programme of seminars on topics which lend themselves to public comment.

(NCDC: 1970:134)

Elsewhere in the same publication, (a high quality and expensive book on "Tomorrow's Canberra"), the planners' priorities are further revealed. The key to the commission's success in the planning and development of Canberra is attributed to five factors:

The public ownership of land and the leasehold system of tenure; the availability of reasonable funds for development, the absence of fragmentation in responsibilities for the planning, development, and construction of the city; mutual understanding of objectives between the leasing and administration authority (the Commonwealth Department of the Interior) and the planning, development, and construction authority; and effective partnership with private enterprise.

(NCDC: 1970:233)

The 150,000 human beings who struggle to breathe life into the monumentality and vistas, the district centres and neighbourhood units, are not accorded the privilege of partnership granted to private enterprise. They are privileged strangers in their own community.

In general, the new communities seem to have deferred to the old paradigm of planning, and their planners occasionally even to have struggled to retard the evolution from a clustered to a reactive environment. There are, however, other possibilities for experimenting with open-ended and adaptive styles of planning that might eventually render the new community experiences relevant to the metropolitan crisis, by moving closer to the disturbed-creative environment. This would

involve planners not in supplementing their physical planning by reacting to community organisations and protests as they appear (and running the risk of entering a conflict situation), but in creating organisation as an ingredient just as essential as roads and shops, and creating it not around particularised interests or territorial units, but around ideals that express the direction in which the community sees itself moving.

Community engagement with planners ought not to be organised around 'participation', which, as in universities, invariably means lower echelons participating upwards in a manner that reinforces status barriers and isolates the 'participators', but around citizen control, delegated power, and partnership. This would mean planners foresaking the shelter and impersonality of the Commission offices and seeking legitimation in terms of human qualities that can be seen to fit them, in some respects, to act on behalf of, and to lead, the community.

Fundamentally, if new communities are to be regarded as more than beautiful set pieces, as ends in themselves, and used by societies to experimentally generate new forms of societal development and regulation that are more promising for the future than those now existing, the conventional industrial techniques of controlling and structuring developments comprehensively from the centre, avoiding or dampening conflicts, and visualising growth only as a quantitative affair, have to be surrendered. The living medium of the coming world is unlikely to be 'cool' and strongly structured by its figural elements, and contemporary designs for creating such worlds are

segmental and irrelevant in the broader picture. It will be 'hot' and fast-reactive, evincing structure only at the field level, phenomenal worlds at lower levels being dominated by diversity, transience and novelty.

To prepare for this world the captains of the new communities ought not to wait upon publics becoming 'more educated', but should vigorously go out and educate and create opportunities for education. Planners who really believe in it, too, might devote resources to running their own continuing education programmes and spread their planning knowledge as far as possible. They might abandon the publication of 'cool' coffee-table books and reports in favour of 'turning on' planning awareness and interest through the local electronic media, seeking the maximum exposure of issues and conflicts. They might even begin weighing the personal satisfactions of advocacy against the bureaucratic security of the planning authority.

Notwithstanding such possibilities in the planning of new communities, there are considerable forces militating against the development of the creative-convergent field out of the clustered and reactive environments of new community settings, and some grounds for suspecting that even if this could be achieved it might not be a convincing demonstration for those who would have to approach this new state from its opposite side, looking back. In particular, generally high levels of content must, with the living environments of new communities compared to those previously experienced, dispose inhabitants against permanent active involvements.

It seems, therefore, that the experiments that have to be undertaken are those directed to producing a disturbed-creative field from states of affairs that have already, in some senses, moved beyond this, into turbulence. This means taking open-ended, adaptive planning principles into the worst communities of the big cities and demonstrating there that people can do their own planning, and through this continuously learn more about planning, their community, and each other. It has to be demonstrated, too, that in this process the community can nurture latent creativity and leadership, and discover the ideals that can focus forces of dissension and distress as well as initiative and enthusiasm.

To push (gratuitously, perhaps), just one step further, we might suggest that any really effective transformation of the turbulent urban field may be brought about by a pincer movement, in which grass-roots transformation of social settings in a number of scattered community laboratories is carried out in connection with (and in direct relation to) the working-out at the level of the leadership of the whole field, of a guiding philosophy or vision of future life in the city. City Hall and ghetto leaders, city councils and ratepayers' associations, city planning authorities and local progress associations might, thus, devote time and effort to negotiating a positive fusion of energies and collaborating in the production of a vision and philosophy for the development of the field as a whole; a vision which the grass-roots transformation might both exemplify and amplify.

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