ORGANIZATION THEORY :
HISTORICAL-THEORETICAL DEVELOPMENT AND THE IMPLICATIONS OF TECHNOLOGY

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ERRATA

PAGE	LINE	CORRECTION
80	31	"...grievance of activity..." - delete "of"
87	19	"...man-production..." - change to "mass-production"
87	23	ditto
91	9	"...machine-minding,man- and process-production." - change to "mass- and process-production."
99	18	"...was learnt, and towards..." - change to "was least"
109	4	"...a group of sixty-four teams..." - change to "sixty-four looms"
124	29	"...man-production..." - change to "mass-production"
125	14	ditto

ABSTRACT

Organization Theory has developed into what has become an interdisciplinary, quasi-independent field of study. It has as its objective the study of the structure and functioning of organizations, and the behaviour of groups and individuals within them. This area of study has, through the years, drawn the attention of writers from diverse backgrounds and with diverse interests. The first focus of this thesis is an examination of the historical and theoretical threads which have contributed to organizational studies. The path followed moves through the following stages : (1) classical theory, (2) scientific management, (3) human factor industrial psychology, (4) the human relations movement, and (5) organizational psychology or "neo-human relations". This thesis looks at landmark contributions, emphasizing the distinct approach, choice of problems, methodology and social attitudes of the proponents. Each stage is characterized by its underlying assumptions concerning the nature of man, ranging from the *homo oeconomicus* of the Taylorians, to the "Complex Man" of writers such as Schein and Bennis. This "pattern" of increasing sophistication is further illustrated by the shift from the limited concerns of early writers, for example, the human relationists' concentration on informal social relationships, to more comprehensive analytical schemes. A further feature of this movement is the inclusion by more contemporary writers of the role of organizational environments in their analyses, an area often neglected. This development culminates in a "reconceptualization" of organizations as systems and it is shown that a systems scheme offers distinct advantages in comparison to previous more limited perspectives.

The importance of technology as a variable in organizational study remains an issue of considerable interest. As a second focus this thesis examines those writers who have, from various viewpoints and with various interest areas, considered the implications of technology in an organizational milieu. Certain writers, such as Sayles and Blauner, are shown to be principally concerned with the effect of technology on workers' attitudes and behaviour patterns. However, researchers from England's Tavistock Institute developed an influential variant of the systems scheme, viewing organizations as "socio-technical" systems. Attention is also drawn to their use of this model in several important studies, although mainly of a case-study type.

Woodward's invaluable researches in the 1950s used a wide comparative research design and her findings are shown to support a technological "imperative" hypothesis. Her findings also underlined the fact that there is no one best way of organizing a business; an organization's structure must be adapted to the demands of its technology and, as others such as Burns and Stalker pointed out, to the demands of its environment, if it is to survive "successfully". Pugh *et al.*'s immensely influential Aston studies, which incorporate an implicit systems approach, are next examined in some detail. This illustrates their substantial contribution to the development of scales which could be used to measure organizational characteristics. Further, these studies and their replications are seen to refute the hypothesis of the technological "imperative", and to relegate technology to a secondary role in organizational analysis.

Finally, this thesis draws attention to, perhaps, the major debate in organizational studies : the system versus the

action approach. The action approach focusses on human action and the meanings attached to their actions by the actors. This approach is shown to overcome many of the shortcomings of a systems perspective, but it is argued that in future organizational research it will be essential to employ both perspectives. No Grand Theory of organizations is at present available or is likely to be developed in the near future. Both a systems and an action approach can be used to generate valuable data, but whichever is used will depend on the order of phenomena the investigator is interested in explaining.

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CHAPTER ONE

INTRODUCTION

Pugh (1966) defined "Organization Theory" as "the study of the structure and functioning of organizations and the behaviour of groups and individuals within them" (p.235). Organization Theory has developed into what is today a quasi-independent, interdisciplinary undertaking drawing its contributory threads from the areas of sociology, psychology, management and business writings, as well as industrial engineering. Pugh (1971a) points out that the history of the study is a long one with the first English textbook appearing in the Thirteenth Century. Early sociology writers such as Spencer and Durkheim referred to organizational principles, but their macro prespective was not conducive to the study of the structure and functioning of organizations. It was only in the early stages of the Twentieth Century that the importance of organizations as planned, functional, social units was recognized, linked with the burgeoning industrialization in western countries. Social scientific interest in industry, particularly, gradually led to formulation of theories and proposals in attempts to explain the functioning of organizations and to prescribe management practices, usually in efforts to increase "productivity".

1.1 "THEORY" AND "PRACTICE"

Generalizations were sought by investigators which, they hoped, could be applied in most organizational settings, and provide guidelines for actual management functioning.

Pugh (1971a) makes the important point that, "Every act of a manager rests on assumptions about what has happened and conjectures about what will happen; that is to say it rests on theory. Theory and practice are inseparable" (pp.9-10). Douglas McGregor too, has asserted, "Every managerial act rests on theory".

The "practice" - "theory" nexus remains one which is often confused and problematical in managerial attitude. Albrow (1974) puts his finger on the problem when he says, "The assumptions, generalizations and hypotheses of the manager are more often than not built up from daily experience and he may believe that his knowledge is in some way "practical" compared with social science, but in their form they are just as theoretical . . ." and, quite often, what a manager believes to be "home-spun theory" is probably based on the social research of the 1930s (p.41). Pugh (1971a) underlines this : "As a cynic once put it, when someone says he is a practical man, what he means is that he is using old-fashioned theories" (p.10). And, indeed, the manager claiming confidence in his "practical" approach is a familiar figure, but theory and practice remain inextricably linked.

This consideration is, perhaps, of added importance to the engineering-orientated manager, who has risen from a position in the technical function within an organization into a position requiring managerial skills. Especially with the increasing complexity of modern industrial enterprise, management "by-the-seat-of-your-pants" is no longer adequate to meet the demands of co-ordinating and directing the many faceted functions or to understand the inter-relationships between the many important organizational variables.

A clear understanding of the historical bases of the assumptions which underly his managerial activities is essential if he is to reach anything close to a wide-ranging and sophisticated comprehension of his position and his role - such an understanding can be substantially furthered by an examination of the major theoretical and historical threads which have contributed to organization theory. This thesis will attempt such an examination, focussing on *landmark* studies in terms of each writer's primary area of interest, specific approach and social attitude. In addition, comments will be directed at questions of research methodology.

Questions of research methodology remain of central importance for leaders and students of organization alike. This importance is made additionally clear when one asks : how many of the "principles" and "rules" of organizational management being taught in educational institutions, or marketed to firms as "packages" for the improvement of organizational effectiveness, are based on empirical evidence methodically searched for within a sound methodological research design? Have value biases or unsubstantiated assumptions always been carefully excluded? An answer or partial answer to these questions can only lie in a critical look at the underlying research designs of some influential organization studies.

1.2 THE PATTERN OF DEVELOPMENT

The primary goal of organizational study probably remains the development of a Grand Theory of organizations which will have an applicability to all organizational forms. However, organization theory does certainly not appear to be close to this ambitious goal at present. In fact, as

Mayntz (1965) points out : "the unity and coherence of the field of organizational research is highly precarious" (p.111). Mayntz points, in explanation, to the fact that empirical case studies have predominated in organizational studies leading to a tendency for particular problems to be examined in particular organizations. Further reasons cited are "the multiplicity of competing approaches" and the "divergent analytical traditions in the study of different types of organizations" (*ibid.*). Silverman (1970), however, argues that there has been some "pattern" in the development of the study of organizations. Organizational study has certainly become more sophisticated over the years, and has moved away from simply a concern with questions of prescription for management, towards broader questions and a fundamental understanding of organizational life. What Silverman particularly discerns, and this thesis hopes to reinforce, is that emphasis in study has shifted from any one aspect of the organization to, in later studies, an examination of the interrelatedness of one aspect of an organization with another. Similarly, early writers in the field failed to examine the significance of the wider social context in which organizations exist. Contemporary writers, on the other hand, have focussed on the interaction between an organization and its environment. Finally, there has also been an accompanying development of more sophisticated methods of study - students of organization have expanded their range of interest to include wide comparative analyses of organizations. Some evaluative observations will also be made on the general significance of these developments for the managers and students of organizations.

Modern organization theory, as an interdisciplinary field of study, has probably only emerged over the last fifteen

or twenty years. Despite the diversity of its parentage, a particular conceptual framework of potentially wide applicability has come to be widely used. This framework developed from a "reconceptualization" of organizations as a whole, which occurred in response to the classical maxims of rational organization and in response to the need for a dynamic model of organizational functioning. This new comprehensive analytical scheme drew on General Systems Theory and sociological Structural-Functionalism and conceptualized an organization as a *system*. The interrelatedness of organizational phenomena, and questions of system "needs" and system "maintenance" now come to the forefront of analysis. To quote Mayntz (1965) : "The application of a systems concept and systems theory to the field of organizations proved of absolutely decisive importance" (p.100). Several important theoretical and empirical studies have used this approach. Mayntz, in fact, maintains that, at present, in general, "we may therefore conclude that organization theory does in fact imply *one* basic system concept, whether as explicit starting point or implicit in the results of analysis" (*ibid.*, p.104). Silverman agrees with this contention, referring to the existence of a "Systems orthodoxy". The implications of the use of a systems perspective in organization study will also receive attention in this thesis.

1.3 TECHNOLOGY AND ORGANIZATIONS

In 1904, Thorstein Veblen charged : "In a sense more intimate than the inventors of the phrase seem to have appreciated, the machine has become the master of the man who works with it and an arbiter in the cultural fortunes of the community into whose life it has entered"

(as quoted in Haas and Drabek, 1973, p.73). He went on to ask : "What can be done to save civilized mankind from the vulgarization and disintegration wrought by the machine industry?" (*ibid.*). Since Veblen, several investigators in various sectors of the social sciences have examined the role of technology in organizations. Technology is, in fact, a variable which has often been excluded from organizational analyses, yet technology and its place within the organizational milieu remain vital areas of understanding for industrial endeavour. The urgency of this understanding is magnified by the demands made on the human and structural factors by large, modern industries employing a range of complex technologies. This thesis will examine the contributions of writers who have been concerned with technology and its influence in the organization. Some of these writers have developed and used a particularly influential variant of the systems perspective, characterizing an organization as a "socio-technical" system. This influence has been reflected in its continued use in sophisticated and extensive studies in the 1960s, which have become immensely important in their field. In focussing on the "technological implications" writers, an attempt will be made to evaluate how important technology, in fact, is as a variable in organizational study.

1.4 THE ACTION APPROACH

The use of a systems perspective is, however, not without its problems, problems which arise from the necessary level of abstraction of this model. The primary danger is that of "reification", that is, the implication that the power of thought and action can reside in the organization itself. For example, a system is said to be

self-maintaining, "but to say that an organization tends to maintain itself can be nothing but a short hand expression for the fact that there are specific persons or groups inside or outside the organization who wish to maintain it" (Mayntz 1965, p.114). The role of purposive human action is obscured or, at best, left implicit. Because of the perceived shortcomings of a systems approach, an alternative analytical perspective has been suggested, the "Action" approach. This approach focusses on human action and its link to socially distributed and generated aims and attitudes. The ends of human participants are regarded as the analytical starting point, rather than the ends of the system. This alternative will also be briefly examined and some comparisons drawn between it and the predominant systems perspective.

Before preceeding, in Chapter Three, to a consideration of the historical and theoretical development of organizational theory, some comments concerning particular problems and definitions in organization study will first be made. Attention will now be turned to these issues.

CHAPTER TWO

SOME DEFINITIONS AND PROBLEMS OF ORGANIZATION STUDY

2.1 WHY STUDY ORGANIZATIONS?

During the last twenty years there has occurred what Rose (1975) refers to as "the explosive growth of organization theory" (p.18), representing many different approaches, models, classifications, typologies, variables and methodologies. Many of these differences arise because of the variety of reasons investigators have for studying organizations and their specific, often narrow, areas of interest. What are the reasons for selecting organizations as a field of study?

The first, and probably the most common-sense, reason is the very fact that most members of an urban society spend so many of their waking hours within organizations of one sort or another. Most people work for or are in some way connected with formal organizations. Both Champion (1975) and Jackson and Morgan (1978) mention this as an important motivator for study. From an involvement in organizations stems an interest in understanding organizational life, its various forms, its functioning and the position of one's own individual job within the complex structure.

Perhaps the most important reason for studying organizations is the potential benefit to be gained by managers and administrators. The study of particular problems within a functioning organization can provide the manager with valuable information regarding the inter-relationships between various

problem elements and thus significantly aid him in his task of co-ordinating and directing the organization's activities toward its objectives. Anticipation of problems is another advantage which can accrue from more complete information and can be a particular aid "to improve manager-employee interaction" (Champion 1975, p.4). Benefits such as increased productivity and a satisfied work-force are seen as potentially possible by application of a more thorough and comprehensive understanding of organizational variables.

There are, of course, those students who undertake studies of the diverse factors within organizations "for the sole purpose of knowing about them" (*ibid.*, p.5). The interest lies in accumulating knowledge about organizations as an area of academic enquiry, without any specific application in mind, i.e., their enquiry is in the realm of what one might call 'pure theory'. Organization Theory, as such, finds itself in an intermediate position between study oriented towards practical situations and 'pure theory'. To quote Champion (1975):

> "By far the bulk of organizational researchers (consisting primarily of academicians and business consultants as well) lies somewhere in between the extremes of exclusively theoretical or exclusively applied interests. In other words, most researchers are concerned about making *both* theoretical and substantive (applied) contributions to organizational literature." (pp.128-129)

Finally, the study of organizations is, perhaps, ultimately directed towards the development of a Grand Theory of Organizations which will have a universal applicability to all organizational settings. As has been mentioned there is no one agreed theory or anything equivalent; Dunkerley (1972) points out,

> "Some writers question the usefulness of attempting to arrive at a general integrated theory. Their argument is that as the theory becomes more generally applicable, then the propositions and the conceptual framework of which the theory is composed must themselves become more general in nature. The point is made that a theory composed of very generalized propositions is automatically devalued as a theory." (p.90)

Dunkerley, however, believes that a unified theory of organizations is possible to achieve and would be helpful in further organizational study. Although, as Perrow says, "no-one is going to be able to 'put it all together' for a long time to come" (1974, p.20).

2.2 "ORGANIZATION" - COMMENTS ON DEFINITION

Beyond one's common-sense perception of what an "organization" entails, there remain certain problems of actual definition for the purposes of study.

Many theorists' definitions of organizations revolve around the concept of organizational "goals". Albrow, in Salaman and Thompson (1973), maintains that an organization "defined as a social unit explicitly established for the achievement of specific goals" has become "orthodox among sociologists and organization theorists alike" (p.401). In support he points to Talcott Parsons' (1960) affirmation that, "As a formal analytical point of reference, primacy of orientation to the attainment of a specific goal is used as a defining characteristic of an organization which distinguishes it from other types of social systems" (p.17). Other definitions involving the goal-attainment concept are cited as those of Blau and Scott (1963, p.1), "An organization has been established for the explicit prupose of achieving certain goals"; and that of Etzioni (1964, p.3), "Organizations are

social units (or human groupings) deliberately constructed and reconstructed to seek specific goals" (Salaman and Thompson (1973), footnote pp.401-402). One might add Champion (1975, p.1), "A formal organization is a pre-determined arrangement of individuals whose interrelated tasks and specialities enable the total aggregate to achieve goals", which is based on Etzioni's definition. Also Udy (1965, p.678) says that formal organizations have "objectives which are explicit, limited and announced". However, there are definite problems associated with definitions in this vein.

As Silverman (1970) points out, the first problem is that of reification, i.e., referring to an organization's own goals leads to the implication that the organization is capable of independent thought and action.

Albrow (1973) refers to several other problems associated with this form of definition. To begin with, "it is commonly very difficult to get an agreed statement from members of an organization as to its goal" (p.402). He adds that even in industrial firms, despite apparently clear-cut goals, "multiple and competing objectives" may be encountered. Company policy statements may reflect very different commitments to those held by the personnel of the firm. Consequently, the goal-attainment approach also tends to obscure conflict of interest among members of the different strata.

Etzioni (1960) adds a further compounding factor by identifying that a company often has "public" and "private" goals and that the "public" are, in fact, never meant to be realized.

A convenient solution to this dilemma may appear to lie in accepting the statements of objectives of those who lead the

the enterprise but Miller and Rice (1967) argue that these statements may still be inappropriate and that an observer is obliged to examine the various parts of an organization in detail to tease out the organization's major purpose. In addition, a bland acceptance of management's assessment of organizational goals opens the researcher to the very real criticism of exhibiting a bias towards the interests of management in his work.

Goals do, of course, exist but Albrow (1973) insists that it must be emphasized that they exist for all organizational strata and suggests that goals often act as legitimizing agents. His suggested definition is :

> "Organizations are social units where individuals are conscious of their membership and legitimise their co-operative activities by reference to impersonal goals rather than to moral standards" (p.409).

2.3 A SCIENCE OF ORGANIZATIONS?

The procedures used so successfully to gain knowledge in the natural sciences will, naturally, have an impact on researchers in the social sciences and, more particularly, in the field of organizational study. The scientific method of careful theorizing, thorough data collection and rigorous analysis is set in a history which is interlaced with traditions, attitudes and assumptions. This method is well known and well established, but, when applied in the sphere of organizations, raises important questions which merit consideration.

To begin with, the history of modern science has certainly led one to assume that applied science can be used anywhere and will always be for the good of all; for example, a card-punching machine would punch cards in South Africa or

Poland and for master or slave equally well. However, when this assumption is carried over to the social sciences it tends to cause important conflicts of interest to be glossed over. The applied social scientist working in an organization, using his theoretical knowledge to develop practical applications, is very often forced to use as his basis the values of the organization and its leaders. This arises because, as management very often foots the bill, the problems examined are those of management. The researcher's applied science now appears more problematic than formerly supposed, as it is obviously being used to enhance the control of one set of individuals over another and certainly cannot be said to be "value free" or for the general benefit of all concerned. Albrow (1974) mentions the case of Taylor's institution of "scientific management" : Taylor always hoped that his applied science would help both management and workers, but his dream was hardly apparent to workers who risked losing their jobs through the increased efficiencies of time and motion studies.

Albrow (1974) does, however, say that, "Organization theorists and sociologists tend to begin their task at the very point where the quest for improved control is critically analysed and where it has generated opposition within the organization". He goes on, "This, indeed, is the feature that organizational science possesses along with the social sciences in general, which distinguishes them from the natural sciences, that human values are central objects of enquiry" (p.34), and he suggests that this fact implies a quite distinct approach. But it does also, however, raise a very taxing question for organizational study, namely, the rendering of objective accounts of the values of others.

A further problem for the social scientist is raised by Gouldner (1970) in reference to an investigator's "domain assumptions". These are seen as "unverified and unrecognised

conceptions of the nature of man and society" (Rose 1975, p.28). Very often these taken-for-granted assumptions are most clearly discernible in the concepts of human nature which underlie organizational studies. As Albrow (1974) says, "a characteristic way for a new school of thought to emerge in organizational studies is by way of substitution of a different viewpoint on human nature" (p.37), and he continues, "But in general we may say that a view of human nature reflects as much how the observer prefers to regard others as it does their 'real' nature. And in that way, if the observers are influential enough, it can be that their view has a chance of becoming a real influence on human nature" (p.38). One might add that Gouldner does not feel that these domain assumptions, which are historically specific and acquired from social background, are beyond remedy. He is certain that sociologists "can acquire insight into their own domain assumptions, and neutralize their effect" (Rose 1975, p.28).

Gouldner's optimism is, however, not shared by those who hold what Rose (1975) calls a "vulgar-Marxist" viewpoint. He uses this descriptive term because, while the viewpoint would be propagated by Marxists, it requires no real knowledge of Marxist theory. In brief, the argument, crudely, is that society is divided into classes of rulers and ruled which are the product of historical forces. The classes are involved in a perennial struggle for power and any social theory emerges only as part of "the ideological apparatus of capitalism" and, as such, serves only to entrench the power relations in the society. The ideas of the social theory are, in other words, used as new means for the rulers to maintain their position. Any organizational study would thus be seen only in this light and the notion that the study could claim to be scientifically "value free" would, consequently, be unquestioningly rejected.

A rather different dimension in this discussion is introduced by Albrow (1974) through the point that "social scientific theories have a dialectical relationship with their subject matter, reflecting on society, being created by it *and in turn helping to create it*" (p.40, my italics). It has often been shown, for example, how the schools of scientific management and human relations have contributed to managerial ideologies which exist. This quality of "reflexivity" implies that social scientific accounts become, in time, both "descriptions and component parts of a situation" (*ibid.*, p.40). Naturally, acceptance of this idea complicates the scientific nature of organizational theory since it holds that, "Social phenomena are no longer the products of impersonal forces. As we act, and give accounts of our actions, we are creating our society and ourselves" (*ibid.*, p.40).

This interactive relationship between theory and society is undoubtedly important but has been the subject of very little systematic study. But the important aspect of this relationship is that it must draw our attention to the fact that many occupations base their everyday activities on some form of theory. Theories set out to describe a situation but become part of that situation in time. When one enters any social system, for example, an organization, one encounters a body of theory which, directly or indirectly, is a description of that system, the interrelationship of its parts, its functions and one's position within it. Albrow quotes Schon (1971, pp.34-35) who goes as far as saying : "It is in a way misleading to distinguish at all between social system and theory, for the social system is the embodiment of its theory and the theory is the conceptual dimension of the social system." Again, this underlies the possible accusation of working, as an investigator, with a management bias; "The differentiation of theories of organization from organizational members and managers is itself an important feature of

organizational development" (Albrow 1974, p.42).

The study of organizations would thus appear to have features which distinguish it markedly from the natural sciences. (More will be said about this later when discussing the "Action" approach.) The argument revolves around organizations being the result of human action and the fact that organizational theory itself becomes a part of organizational life. These perspectives, along with a critical examination of the researcher's own "beliefs" about society, are essential if an adequate understanding of dynamic organizations is to develop.

2.4 FRAMEWORK, MODEL AND THEORY

An adequate understanding of the complex networks of inter-relations characterizing formal organizations is aided by using theoretical schemes which logically link organizational variables. The term "theory" can be used in two ways, either in the form of a tentative unproven generalization or it can represent a conclusion and summary resulting from analysis of available data. However, whichever way it is used, a "theory" can generally be defined as "an integrated body of assumptions and propositions which are related in such a way as to explain and predict relations between two or more variables" (Champion 1975: p.9).

NB

The first element of a theory is an "assumption". Champion argues for assumptions being based on relationships within organizations which occur regularly and, because they are confirmed repeatedly, one has confidence in their validity. Assumptions provide the building blocks of a theory, along with "propositions". These may be seen as statements which are more tentative and embrace a greater degree of uncertainty than do assumptions.

"Hypotheses" may be viewed as "statements which can be subjected to empirical test in order that the validity of any given theory from which they were deduced can be ascertained." (*ibid.*, p.9). Hypotheses are, then, the tentative statements derived from the body of theory which a researcher can take to the organizational environment and test, hoping to refute or reinforce the theory.

However, an important relationship is that between a "theory" and a "model" although the two terms are often used synonymously. As contrasted to a theory, Champion again believes a model refers to a set of organizational characteristics "which permit portrayal of an organization or organizations from a particular viewpoint or dimension" (*ibid.*, p.14). A model, therefore, essentially directs one's attention to certain dimensions of an organization "which may elicit greater insight into the problems of organizations. Models act as classificatory schemes upon which theories can be constructed" (*ibid.*, p.5). In other words, models and theories are closely interrelated. For example, the "goal" model of organization would be that an organization is a grouping of individuals performing specific tasks which will allow the organization to achieve particular goals. Theories could then be based on this model but specifically linking organizational variables. A distinction drawn between models and theories draws attention to the fact that a model can be usefully utilized even though it may yield certain conclusions which are clearly wrong, as long as some of the conclusions yielded are correct. This is not, however, the case with a theory. A model has thus more of an heuristic element.

The final concept which is often encountered in relation to "theory" and "model", is "frame of reference". A frame of reference can be regarded as simply a way of looking at

things or approaching a problem. No explanations or predictions are conveyed. A useful way of interrelating these analytical concepts is shown in Table 1.

The Relationship between Frames of Reference, Models, Theory, and Hypotheses

Frame of Reference	-	Orienting mechanisms, approaches
↓		
Model	-	Class : factory scheme
↓		
Theory	-	Building the explanatory framework & identifying specific variable interrelationships
↓		
Hypotheses	-	Logically deduced, testable statements from theoretical schemes

TABLE 1+

(+From Champion 1975: Table 1-3: p.15)

2.5 UNITS OR LEVELS OF ANALYSIS

Different levels may be chosen at which to approach a study of organization. The level or unit selected will reflect the particular interest area or problem area to which the investigator wishes to address himself and concerning which he wishes to formulate theoretical schemes. Dunkerley (1972), Champion (1975) and Jackson and Morgan (1978) are among writers who identify three basic levels of analysis :

(1) the individual and his role,

(2) "aggregations of individuals" (Jackson and Morgan 1978,

p.33) or small interpersonal groups, which can be thought of as an "intermediate" level, and

(3) the "macro level of organizational study" which "views the organization itself as a unit of analysis" (*ibid.*, p.33).

Each specific level will elucidate a particular set of relationships and will have its own advantages and disadvantages as an analytical focus. The levels are, of course, to a degree complementary and interaction occurs between them in any organizational setting. The field of formal organizations offers potential investigators an immense reservoir of phenomena to study and attempt to explain. Some comment is appropriate on the method of enquiry into these phenomena at whatever level chosen.

2.6 SCIENTIFIC ENQUIRY

(Much of this discussion is based on Champion 1975.) The concern with *objectivity* remains paramount in organizational studies. As has been mentioned, this concern is inherently complicated by the danger of an investigator allowing the forces of his own preconceptions to influence his approach. But, as some ordering of information is unavoidable, implicit or otherwise, the attempt to avoid this *normativeness* is extremely difficult.

A basic method for trying to deal with this problem is an insistence on *confirmation* linked with empirical testing. Different theories put forward by a particular researcher are tested by several scientists in a movement towards closer agreement about what the true situation actually is. In this way, the development of an organizational study can be viewed as a dynamic, ongoing, evolving process, with facts

regarding organizations being clarified and ordered.

Empirical testing usually is carried out within the framework of the scientific method as applicable to the social sciences, the central concern being the test of a current hypothesis. Figure 2 is a representation of this method. Observation of organizational phenomena, or response to an organizational problem, will lead an observer to attempt some conceptual explanation or ordering in his mind. From this conceptual *model* more precise statements of interrelationships between phenomena can be developed to produce the *theory*. The next stage in the confirmation procedure is the testing of the derived *hypothesis* in an appropriate test environment. If the results refute the theory this can result in the theory being abandoned, being modified, or, perhaps, tested under new organizational circumstances to prove whether it still lacks predictive possibilities. On the other hand, if the results appear to support the theory, further studies, *replication studies*, can be undertaken to reinforce the original explanations. One study is not usually sufficient to impart confidence in the validity of a theory. These replication studies are usually "under similar conditions in a different social setting" (Champion 1975, p.12), and the need for such studies is inclined to cause the verification of a theory to be a lengthy process. This repetition has, however, become an increasingly important method of advancing the boundaries of Organization Theory, especially with the development of better measurement methods and research procedures. Several basic research procedures are generally used in organization study.

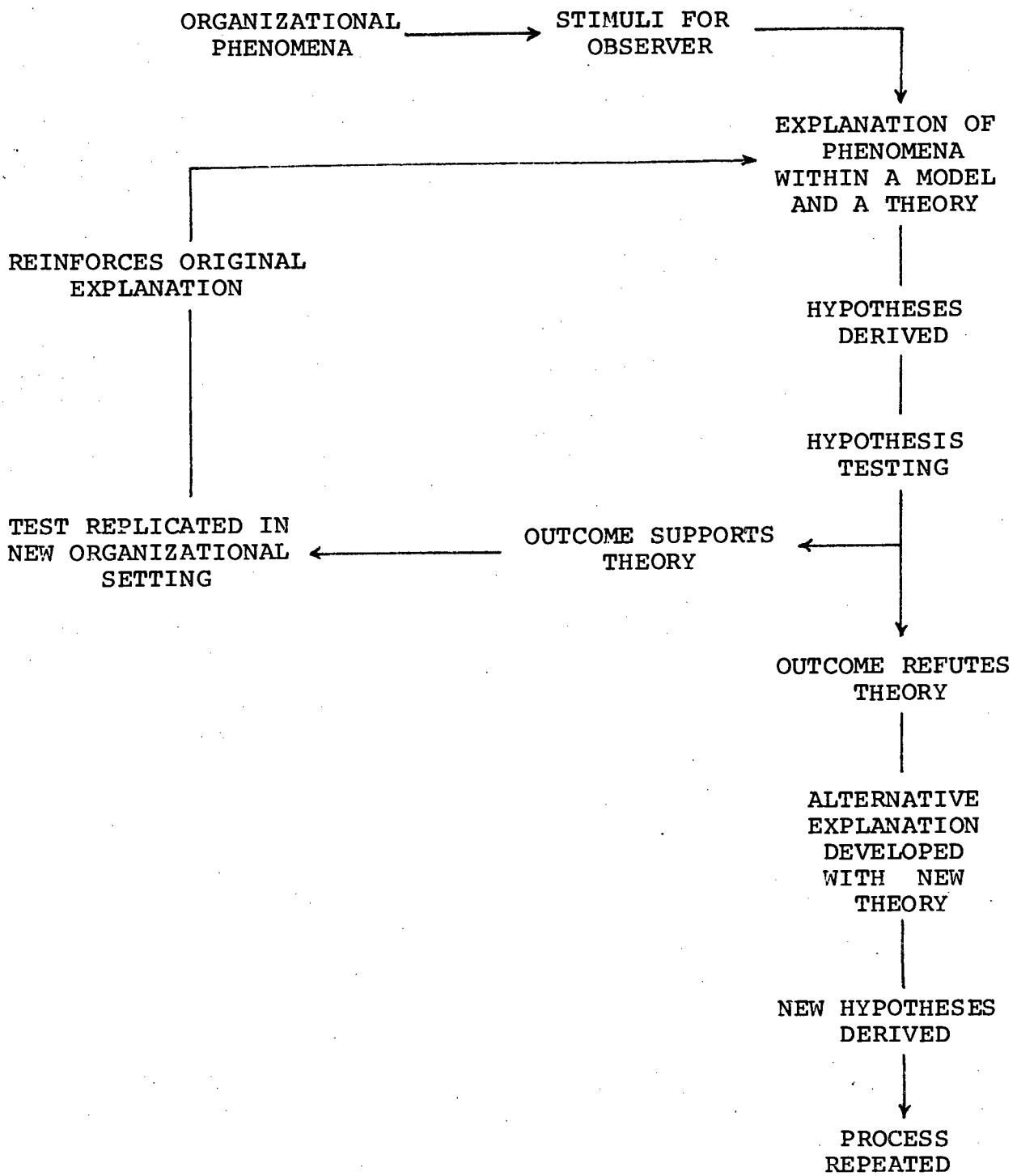

FIGURE 2

THE PROCESS OF SCIENTIFIC ENQUIRY

2.7 RESEARCH METHODS

(Much of this discussion is based on Jackson and Morgan 1978.)

Research methods in the study of organizations can, broadly, be divided into two groups, *field* methods and *laboratory experiment* methods. The choice for the investigator lies in either examining the organization in its natural environment, or attempting to duplicate the environment in a laboratory.

2.7.1 Field Methods

Jackson and Morgan suggest the following classification of field methods :

(1) the case or multiple case method,

(2) the comparative method,

(3) the natural experiment, and

(4) the field experiment.

Case Study

The case study method involves an intensive examination of an organization and comment on the particular aspects being examined. The method of "participant observation" is useful to assemble data, although questionnaire-based research can be an alternative, depending on the researcher's particular focus.

Case studies are often criticised for their very specific

nature and the consequent inability to generalize from them. Case studies are often confined to a single organization and any generalization would depend on that organization being *typical*, which is very difficult to judge. In addition, the importance of a case study must hinge on the extent to which the investigator links the study to his general theory, in which case the study becomes a specific test of some aspect of this theory. However, even if the study is left at a purely descriptive level without any link to a specific framework, it can be argued that the information gained remains valuable as a source of suggestions for strategies in further research.

Champion (1973) mentions, "A primary strength of case studies is that they offer an *in-depth* appraisal of organizational behaviour" (p.133, my italics). The researcher essentially has the opportunity of becoming involved in considerable detail in his search for explanations of organizational functioning and behaviour.

Comparative Study

Blau (1965) defines the "comparative method in the study of organizations" as "the systematic comparison of a fairly large number of organizations in order to establish relationships between their characteristics" (in Grusky and Miller 1970, p.195). Blau points out that the nature of the approach can be clearly seen when juxta-posed with the case study approach. Only systematic comparisons of many organizations can, in fact, establish relationships which *can* be generalized into theoretical principles about organizations. This is highlighted when the concern is with the "organizational" level of analysis: for example, the study of the influence of environment on organizations can only be carried out if the research design incorporates organizations in several different environments. Examples

of important recent studies (which will be dealt with in a later section) which use comparative analysis are those of Child (1972), who looked at 82 organizations focusing on aspects such as formalization, specialization, centralization, etc., which he contrasted to an earlier study by Pugh *et al.* (1968).

Comparative studies, as opposed to case studies, do, however, tend to be more superficial in the information they provide, but the advantage lies in focusing upon specific characteristics in many organizations rather than in just a few.

One possible difficulty and source of criticism of comparative analysis lies in the matching of organizations. Comparison of a particular variable in several organizations relies on the certainty that the organizations examined do, in fact, all have the variables in common.

Natural Experiment

This kind of experiment is concerned with *natural* change in an organization.

> "In this kind of experiment the researcher observes and perhaps takes measures on an organizational situation before a natural change takes place in the organization and then observes and/or measures the same variables after the change" (Jackson and Morgan 1978, p.39).

An example of natural change would be the shift from a centralized to decentralized operation.

Field Experiment

The field experiment is similar to the natural experiment

except for the fact that, in the field experiment, the researcher is instrumental in *causing* the change. This might, for example, occur when a consultant institutes some programme, measuring variables before and after the programme commences.

Field methods, generally, have their particular set of advantages and disadvantages. Because they examine organizations in their natural environment, they have the advantage of being realistic. However, included in the disadvantages are such important factors as the control of variables, which is understandably difficult in a complex, working organization, and the greater cost involved in these studies. The complexity of the organization in its natural setting can also make the actual isolation of relationships a difficult task.

2.7.2 Laboratory Studies

The alternative remains to attempt to study aspects of organizational functioning in the laboratory. The key characteristic of this form of study is that the environment is created *by the researcher*, and, consequently, the conditions under which observations are made can be very closely controlled. Relevant variables can be isolated and manipulated and the responses of dependent variables precisely measured.

However, laboratory studies are often criticized for their "artificiality", although some writers believe that this disadvantage can be overemphasized. Jackson and Morgan (1978) point to Zeldich's comments that laboratory studies only try to create those aspects "relevant to some theory and then study those in the laboratory" (p.41). The process

is necessarily selective with regard to what particular aspects are examined.

Both field and laboratory studies can be seen to have their inherent advantages and disadvantages and, naturally, the methodology chosen will depend on the problems or phenomena being investigated. The overall objective remains the establishment of principles capable of generalization.

The implications of the problem areas discussed, and the implications of the methodological issues dealt with in this chapter act as an essential backdrop against which to see organization theory and its development. Attention will be directed in the next chapter to the major historical and theoretical threads which have contributed to the field of organization study.

CHAPTER THREE

HISTORICAL AND THEORETICAL DEVELOPMENT OF ORGANIZATION THEORY

The body of literature which addresses itself to organizations and the problems of organizational life is vast and has, over the past twenty years, expanded rapidly. The sphere of organizations has, over the years, drawn the attention of sociologists, psychologists, economists, as well as business and industrial administrators and a consequent enormous diversity of approach and choice of emphasis pervades the writings on organizations.

Nevertheless, it remains that "understanding of the theories and viewpoints put in the past is a necessary prelude to understanding current theory. It gives one a deeper insight into what lies behind current assumptions and propositions, and consequently a tighter grip on these" (Sofer 1972, p.vi). However, such diversity creates problems for students and writers alike and a measure of selection has become essential when dealing with the area of organizational studies. In my review of the material which added to the understanding of organizations I will attempt to delineate the *landmark* contributions, emphasizing the distinct approach, choice of problems, methodology and social attitude of the proponents. My selection will also be biased towards those theorists and investigators whose concern and contribution has had particular relevance for the sphere of industrial endeavour.

The path chosen will move through the following principal stages of development :

3.1 classical theory,

3.2 scientific management,

3.3 human factor industrial psychology,

3.4 the human relations movement, and

3.5 organizational psychology or "neo-human relations".

(Strict chronological ordering has not always been adhered to where a theoretical grouping provides greater explanatory coherence.)

Following on from the work reviewed in this chapter, the next important focus of organization theorists centred on a revision of emphasis : "technology" and its implications for organizations came to the forefront of interest.

3.1 CLASSICAL THEORY

Max Weber and Bureaucracy

Although Weber's seminal work on bureaucracy did not address itself directly to industrial organizations, a brief review is included because of the importance of his contribution to early organizational thinking.

"Weber's principal contribution to the study of organizations was his theory of authority structures which led him to characterize organizations in terms of the authority relations within them" (Pugh *et al.* 1971b, p.19). Weber was concerned with the reasons behind people's obedience to orders within the organizations he referred to as bureaucratic. To a degree, he argued, an organization could depend on its *power* to ensure obedience, that is, using a system of reward and penalty but this method had its shortcomings. He pointed out

of these offices should follow "the principle of hierarchy" (*ibid.*, p.18) and no office is uncontrolled. In addition, the actual staff members of the administration "should be completely separate from ownership of the means of production or administration" (*ibid.*, p.19). A further feature of this staff membership is that any member must be free to be re-located from office to office depending on the organization's requirements. And, ideally, all decisions, rules, actions must be recorded in writing. An important element, finally, is that selection for a particular office should be based purely on technical qualifications.

Weber believed that a purely bureaucratic organization was capable of achieving the highest degree of efficiency and also believed it to be "the most rational known means of carrying out imperative control over human beings" (*ibid.*, p.25). The principal source of bureaucracy's superiority was claimed to reside in its reliance on technical expertise and knowledge, a central feature of its rationality.

March and Simon (1958), in their important work, draw together some of the main criticisms of Weber's theory of bureaucracy. Weber is shown as not "exceptionally attentive to the character of the human organism" (in Pugh (ed.) 1971a, p.30). It is pointed out that unanticipated responses of the organization members can be dysfunctional. Weber's emphasis on control and reliability of behaviour could encourage a reduction in inter-personal relationships and promote rigidity of behaviour, with consequent problems for organizational functioning. Another factor is that the departmentalization which appears can cause sub-units to emerge which begin to value their own interests and achievements above those of the organization, encouraging consequent conflict. March and Simon also mention Gouldner's comments concerning the unintended cues provided for organization members by work

rules. Gouldner feels the over-definition of behaviour can motivate individuals to conform to the *minimum* level required.

Despite the potential problems in his formulations, Weber's theory represents one of the earliest attempts to systematise the structure of an organization.

The Early Management Theorists

The writers grouped together under this heading made some contribution to answering questions about directing, co-ordinating and managing an organization's many functions and laid the foundation of what is thought of as modern *management theory*. The writers included are Henri Fayol, James Mooney, Alan Reiley, Lyndall Urwick, Oliver Sheldon and Mary Parker Follett.

Fayol is often referred to as the "Father of Modern Management" and wrote a volume entitled *Industrial and General Administration* published in 1929 in which he tried to systematically organize the knowledge gained from his own long managerial experience. He spent from 1888 to 1918 as Managing Director of the French mining and metallurgical company, Commentry-Fourchamboult-Decazeville.

In defining administration, Fayol began by suggesting that any business or industrial undertaking could have its operations divided into six groups : technical, commercial, financial, security, accounting and managerial. His analysis of these operations pointed to the varying measures to which they were represented in jobs, from the large technical component in a workman's tasks to the larger managerial element found in senior jobs. In further attempting to answer the question : what is management?, Fayol made

one of his greatest contributions to management. He defined management as comprising five elements : forecasting and planning, organizing (structures, humans, materials), commanding (personnel), co-ordinating (all activities and effort) and controlling (in conformity to rules and procedures). His belief was that these functions were essential tasks of the effective manager and strongly advocated that management could be taught.

Fayol went on to summarize his experience in a number of "principles of management", saying "it seems at the moment especially useful to endow management theory with a dozen or so well-established principles, on which it is appropriate to concentrate general discussion" (Fayol 1929 as quoted in Sofer 1972, p.130). His fourteen principles including such classic concepts as division of labour, unity of command, subordination of individual interest to the general interest, the hierarchy of a scalar chain, allowing personnel to use initiative and centralization/ decentralization. They vary from being descriptive and prescriptive to being moral precepts and are often too vague or abstract for application. As Sofer (1972) underlines, "what they are clearly not, from the viewpoint of contemporary social science, are descriptions of how organizations work . . ." (p.132).

Despite these comments, Fayol should be seen in the context of his time. He was doubtless a pioneer in examining the ways of running an organization and attempting to define management. "He is the earliest known proponent of a theoretical analysis of managerial activities - an analysis which has withstood a half-century of critical discussion" (Pugh *et al.* 1964, p.65).

James D. Mooney and Alan C. Reiley very much extended and

developed Fayol's ideas. They co-authored a book which involved a "rather complex conceptualized framework of management" (Hodgetts 1975, pp.49-50). They believed in a formalism based on principles and built up their own model of causal relationships of management, emphasizing a principle-process-effect linkage. Lyndall F. Urwick went on to attempt an integration of the work of Taylor, Fayol, Mooney, Reiley and other early writers in the field. Oliver Sheldon, in England, also brought out an important book at the time *The Philosophy of Management* (1923). His work was very much in the vein of Fayol and Mooney and Reiley except for some discussion concerning the relation of management to society and management's social responsibilities.

Another early classical writer worthy of mention is Mary Parker Follett, although her view differed significantly from those of Fayol, Mooney and Sheldon. Her attention was mainly on the areas of sociology and psychology and management was viewed as a "social process". "Follett oriented her thinking about management to the continually changing situation and to the evolving or emerging developments. It is this concept of emerging that contrasts with all the other classical writers; whereas most classicals viewed organizational developments as a series of discrete formal changes, Follett treated organizations as a flowing and continuous process" (Massie 1965 in March (ed.) 1965).

The classical management writers thus focused their attention on the functions and "principles" of management. These principles have been the object of heavy attack for being incorrect and misleading. In 1948, H.A. Simon went as far as to say that the current "principles of administration" were "little more than ambiguous and mutually contradictory proverbs" (p.240), and provides incisive criticism of many particular principles. And, indeed, one cannot really

examine the work of these writers beyond the level of "principles", but this limitation does not negate their contribution. They represent the attempt of writers with wide experience in organizations to assist others by pointing to possible consequences of various ways of acting. It is important to note that these precepts were not backed by empirical investigation and experimentation, but certainly provided the starting points for research. Despite the criticisms directed against them, the contributions of especially Fayol, Mooney and Sheldon have become foundations for later refinements of management principles and continue to be used as a guide to business practice.

In their attention to management precepts, the early management writers certainly minimized the effect of the human factor and the ideas of informal organization and human organizational behaviour received scant mention. Man is implicitly seen as acting rationally, disliking work, requiring close guidance and supervision, preferring direction and the clear delineation of his task area. Also workers are assumed to be motivated by economic needs, an assumption which provided an underpinning for another classical theorist, F.W. Taylor.

3.2 SCIENTIFIC MANAGEMENT

Frederick Winslow Taylor's work in the late nineteenth and early twentieth centuries constituted one of the first real studies of organization and management and developed into what has become known as "scientific management".

Taylor, a mechanical engineer, addressed himself to problems such as : How should one structure and manage an organization to realize its potential productivity? What should be done to

workers and their jobs to increase efficiency? Taylor diagnosed the problem of the industrial situation as being inefficiency, the wastage of resources, especially time. This inefficiency stemmed from the workers, through "soldiering" and "slacking", and from management, through their incompetence. Taylor saw the aim of "scientific management" to be the overcoming of these problems and hoped that his system would create "an authentic industrial partnership" (Rose 1975, p.34), since it should be acceptable by management and workers alike. He saw this as a possibility because his system was *scientific* and hence impartial and universal; and he saw in the production engineer the propagator of his system.

Broadly, Taylor's system involved "a systematic study of work to discover the most efficient methods of performing the job, and then a systematic study of management leading to the most efficient methods of controlling the workers" (Pugh *et al.* 1964, p.98). Taylor's system for achieving these ends is pulled together in his four "principles of scientific management". The first step was the gathering, by management, of information regarding times, skills and techniques of job-performance and then, using this knowledge, to design the most efficient method eliminating wastage of time and effort. These proposals proved very influential and Taylor is correctly regarded as being the founder of work-study based upon them. Use of this knowledge, Taylor believed, would result in higher output by workers and thus higher wages. The next step would be "the scientific selection and then the progressive development of the workmen" (Taylor 1947 in Pugh (ed.) 1971a, p.126). To earn his higher wage a workman had to be scientifically selected for the job and then trained systematically until he was a "first-class" man. Taylor's third stage was the bringing together of his "science of work"

and the scientifically selected and trained personnel. Taylor saw the major resistance to his scientific management coming from management; he saw comparatively little opposition coming from workmen with their new wage rates. The final stage, which he admits to be the most difficult, involves "the constant and intimate co-operation of management and men" (Pugh *et al.* 1964, p.99). An almost equal division of work between management and workers would be required. Management assume all the work for which they are suited; Taylor saw most of the work under the "old type" of management falling on the workmen's shoulders. What now occurs is that "there is hardly a single act or piece of work done by any workman in the shop which is not preceded or followed by some act on the part of one of the men in management" (Taylor 1947 in Pugh (ed.) 1971a, p.128). With this close co-operation opportunities for conflict are almost eliminated.

As Howell (1976) says, "scientific management represented the first reasonably comprehensive philosophy of management" (p.16), but it was also based on a very narrow view of man's nature. As Rose (1975) points out, "The most striking element in Taylor's thought is his tendency to equate men with machines" (p.62). Workers were seen as lazy, unintelligent and unreliable and the only possibility of making them more productive was to increase the "machine-like" nature, e.g., standardize their work activity as much as possible and exercise close management control. In addition, monetary incentives were again seen as the prime motivator.

Even during Taylor's lifetime scientific management was the subject of great attention and debate. Taylor was essentially working in an era when industry was undergoing unprecedented development with technology and "science"

becoming the deities of progress; his work was very much a reflection of this spirit. However, management and union hostility to his system never subsided, a state of affairs aggravated by the strike at the Watertown Arsenal which showed the inability of scientific management to successfully contain worker-management conflict. Taylor, of course, had his following and men such as the Gilbreths and Gantt developed and supported his ideas and, indeed, it is undeniable that his work is still clearly reflected in industrial engineering. However, Taylor's view of man remains a "bizarre conception", to use Rose's term, and it is against this mechanistic, machine-like concept that much later work was directed.

3.3 HUMAN FACTOR INDUSTRIAL PSYCHOLOGY

(This discussion will be based largely on Rose 1975.)

Taylor's image of the worker had certainly met with profound opposition in America, but it was British investigators who substituted "an image of the worker as a complex organism for Taylor's greedy robot" and "opened the way to study of the less tangible influences on worker behaviour" (Rose 1975, p.65). Rose points out that the subsequent human relations movements depended considerably on this group of workers and their achievements. British human factor industrial psychology does not often receive attention in texts, but represents an important stage in the understanding of human behaviour in organization.

The central figure in human factor industrial psychology was C.S. Myers. As founder and Director of the National Institute of Industrial Psychology (N.I.I.P.), founded in February 1921, and a member of the Committee on Industrial

Psychology of the Industrial Fatigue Research Board (I.F.R.B.), his influence was considerable. The bulk of the efforts of these investigators was channelled into "establishing the parameters of *physical influences* on work-behaviour" (*ibid.*, p.66, my italics).

One of the first problems turned to by the Myersians was that of fatigue. However, it soon became apparent that actual measurement of fatigue produced a huge problem. Myers emphasized the conceptual difference between *clonic* and *tonus* activities, the former comprising sudden, intense muscle contractions leading to early signs of tiring, and the latter comprising the maintenance of posture with rhythmical, co-ordinated work. He saw this second kind as being fundamental in industrial work and maintained that it could be reduced by work-pauses and adjusted working hours. Myers also assessed the importance of individual psychological differences. However, the "complexity of the state of fatigue and the impossibility of its direct measurement forced the Myersians to adopt indirect indicators which were themselves unsatisfactory" (*ibid.*, p.73). These included labour turnover, lost time and sickness.

The Myersians were still part of the early tradition linking psychology and physiology closely. This bias led them to also devote their efforts to looking at establishing "ideal environments" for various work types. Conclusions were reached about work-place atmosphere, lighting and other environmental factors such as noise. These studies were always conducted with the greatest rigour of method and seriousness and the factors studied represented a considerable advance on the 1920s. In fact, at times, explanations proposed approached being sociological in nature; for example, absenteeism was linked to distance of

a colliery from the workers' homes.

The Myersians' study of fatigue led them to a consideration of monotony, and, despite the loss of scientific rigour, they accepted that assessment of degree of boredom would have to rely on the subject's own report and could not be objectively measured. Studies of repetitive types of work were undertaken and attempts were made to relate boredom to an individual's characteristics; for example, they established that "more intelligent" operatives showed a greater tendency to be bored. "The technical features of the work seemed to operate as follows : where the task was highly automatic, or where it demanded complete concentration, boredom was reduced . . . The most boring tasks were those demanding partial or intermittent concentration" (*ibid.*, p.79). This finding was particularly significant for later writers looking at the effects of the technology of a work-place.

The Myersians' evidence showed that rest periods, activity changes and "payment by results" could assist in fighting boredom. A very interesting conclusion, pointed to by Rose, is the assertion that working in close social groups, with conversation and interaction, could reduce monotony, a claim "seized on later by the Mayoites" (*ibid.*, p.79).

The model of man embodied in the Myersian work is an essentially "behaviourist" one, i.e., patterns of behaviour occur in response to external stimuli, and has also been seen as mechanical. One Myersian, May Smith, challenged this view and emphasized the variety of human personality, and moved away from the physiological bias of many of the other workers. Overall it is thus clear that the human factor school directly confronted Taylorism and its psychological assumptions. Rose quotes Friedmann's

appraisal : "Man, with the whole of his personality, is again introduced . . . The abstract worker conceived by the Taylorians - a crude composite of laziness and desire for gain - yields to a complex being, both body and mind, in whom an all-important act such as work involves the whole personality" (*ibid.*, p.84).

The development of applied psychology in the early 1900s in America, which paralleled the human factor movement in Britain, exhibited some significant differences. These workers, prominent among them James McKeen Cattell and Hugo Münsterberg, promoted the relevance of individual differences and aptitudes and the consequent careful selection procedures required to match people and jobs. Psychological testing acquired full respectability through its application during the First World War, a popularity which later drew prominent figures, among them Cattell, into industrial consultancies. These trends caused the work to become very demand-based and tended to be oriented toward the production of rapid results, moving away from the careful empiricism of the British workers.

Certainly one of the most interesting facts about Myers was his insistence on maintaining a high standard of scientific rigour - an insistence which underlined the need for the *scientific study* of work. Their painstaking methods certainly added to their lack of "glamour", as Rose puts it, but they established an important counter to scientific management and their contribution becomes additionally clear in the light of the human relations movement.

3.4 HUMAN RELATIONS

The human relations branch of industrial studies has

probably generated more interest outside academic milieux than any other. Their contribution has been seen as the beginning of a "sociological conception of industrial events" (Rose 1975, p.104), emphasizing the importance of worker involvement in social groups. Their ideas about the nature of organizations and their human members certainly proved provocative and have drawn often devastating attack from diverse quarters. Nevertheless, their work remains of sustaining interest and significance.

Elton Mayo and the Hawthorne Experiments

As a point of departure, a look at the human relations movement must begin with Elton Mayo, often referred to as the founder of the human relations movement and, indeed, of industrial sociology, and also with the now famous "Hawthorne experiments".

These experiments were carried out at the Hawthorne Works of the Western Electric Company in a suburb of Chicago and lasted from the mid 1920s to the early 1940s. Outside bodies, including the Harvard Business School to which Mayo was attached, gave advice to the company during the researches, which can be grouped into four phases.

The first phase resembled the work of the British human factor psychologists and was carried out initially by a number of the company engineers. The effect of illumination on production was investigated in two groups of workers, the light being varied in one group and held constant in the other. The production of the workers in *both* groups rose. They then turned their attention to what is known as the Relay Assembly Test Room, and it was after the beginning of this experiment that Mayo's assistance was called on. Nine female operatives, working on assembling telephone relays, were separated in a test room and, over

five years, various conditions of work were altered and their effects on the women observed. To begin with, the women were placed on a group bonus scheme. The various changes investigated included rest-pauses, refreshments and shorter working hours. In addition, the research team made a point of communicating openly with the girls throughout the period. "Almost without exception output increased with each change made" (Pugh *et al.* 1964, p.127). A second group of relay assemblers, remaining in their department, was used to test the incentive scheme introduced with the first group - output again rose. The Mica Splitting Group constituted the next part of this phase : five girls were again placed in a test room and subjected to changes in working conditions, this time over two years, but the group never worked well together.

The Relay Assembly Room demonstrated clearly that merely changing itemized conditions would not necessarily affect a worker's output. The women in the Test Room, however, had increased freedom of decision and control over their work and its pace and had formed a cohesive social group. The effective communication between the researchers and the women had also created an atmosphere of sustained interest in the women's work - the consequent feeling of importance and novelty led to the new higher levels of production. This phenomenon became known as the "Hawthorne effect". It has also been pointed out that this communication system implied a different supervisory style which probably was an important additional factor.

The second major phase of the researches took a different form : an interviewing programme was instituted. The main information that emerged concerned worker attitudes : "The major finding of this stage of the inquiry was that many problems of worker-management co-operation were the

results of the emotionally based attitudes of the workers rather than of objective difficulties in the situation" (Pugh *et al.* 1964, p.128). Influenced by Pareto's concept of non-logical action, Mayo now postulated that this non-logical action predominates in social life and derives from "sentiments" or unconscious predispositions. Mayo also concluded that, because these "sentiments" were so pervasive, they meant that many could never be adequate rulers, as this function requires in contrast, the exercise of a predominantly logical approach.

The third phase was designed to observe workers in their natural working environment and a number of employees in the Bank Wiring Observation Room were constantly monitored. It was discovered that the workers actually *restricted* their output : the integrated social group set a standard output and group members were expected to conform to it. The incentive scheme in operation did not seem to be particularly significant to the workers and, in addition, a clear social structure and code of behaviour was observed within the group.

The fourth and final phase was a programme of continued personnel counselling. At first this was supposedly a continuation of the research but probably degenerated into an information gathering and manipulative tool for management.

The changes in methodology as the researches progressed is interesting to note. Initially, in the human factors phase, output was used as a measure of the influence of physical variables and, as the interest shifted to attitudes, interviewing was instituted. Finally, with the emphasis again on the group, group observation returned. "The core of the research problem seems to have been defined as that of exploring what in the work situation determined the attitudes of those within it" (Conacher 1979, p.10).

However, it is also in this area of experimental methodology that the Hawthorne studies exhibited major shortcomings; for example, criticisms include the following : control groups were rarely established, the time factor was ignored and the affect of the impending economic depression consequently glossed over, sampling techniques were dubious and data recording was often superficial. Carey (1967), in a recent re-assessment of the Hawthorne researches, in fact, holds that the results support substantially *different* conclusions to those reached by the investigators and other human relationists. Rose (1975) goes as far as saying, "As a research programme . . . Hawthorne displays a methodological and technical incompetence remarkable even by the standards of the day" (p.132).

Appraisal of the Hawthorne studies must take into account an important distinction between the interpretations of Mayo's popularized account, *The Human Problems of an Industrial Civilization*, and the definitive work by Roethlisberger and Dickson, *Management and the Worker*, published much later. However, Pugh *et al.* (1964) sum up the contribution of the studies : "Taken as a whole, the significance of the Hawthorne investigations was in 'discovering' the informal organization which it is now realized exists in all organizations. It demonstrated the importance to individuals of stable social relationships in the work situation" (p.129). Mayo himself was concerned about the "rootlessness of individual existence in industrialized society" and his solution was that "work groups of large organizations should be made the focus of social living, responsibility for this integration being entrusted to an élite of socially skilled managers" (Rose 1975, p.114). The underlying version of the nature of man had now changed from that of a lone individual, motivated solely by economic incentive, to a view of man as "social

man . . . seeking satisfaction primarily by membership of stable work-groups" (Silverman 1970, p.75). In addition, the recommendations to management were now clear : management should concentrate on the small group and "guide" employees away from group identifications and memberships hostile or indifferent to the employing organization" (Sofer 1972, p.76), by using techniques such as "expressive" supervision, good communication and worker participation in decision-making processes.

Criticism of these views soon came to the fore. Human relations techniques did not always produce the results predicted when tested in organizational practice. It began to be suggested that factors like communication did not exist in isolation but were linked to other "more basic aspects of organizational structure" (Silverman 1970, p.76). Extra-organizational factors also received small attention and in-plant factors were overwhelmingly considered as influencing worker behaviour and attitudes. This is underlined by their ignoral to a great extent of the role of organized labour and local labour markets.

A further criticism directed at these human relations workers is for the management orientation of their work : they concentrated on variables that managers could manipulate, for example, communication and information systems, and neglected questions of institutional and structural variables which might have had greater explanatory power. In so doing, they "failed to recognize the extent to which the economic enterprise is an arena for struggle between diverse and often conflicting individual and group interests" (Sofer 1972, p.76). The implicit suggestion is that no real conflict of interest exists between employees and managers; improved managerial practice can solve all conflicts between individual/group needs and organizational goal attainment.

The human relationist view of man has also come under fire. It has been argued that their "social man" did not take into account the multi-dimensionality of personality needs - the need for satisfactory group membership was overemphasized and other equally important needs forgotten. Maslow (1954), particularly, pointed to a spectrum of needs requiring satisfaction.

However, the impact of Mayo and his colleagues and the Hawthorne studies has been profound. First, the research methods used, however inadequately, were a pioneering example to later workers. And, of course, their conclusions about people in the work place "completely upset the commonly held notions of how workers react to authority and how production can be stimulated" (Guilbot 1968 in Sofer 1972, p.80); central to this being the emphasis on informal groups and their role. The influence of this work on managerial thinking led to an increased concern with human problems in labour management, an emphasis on incorporating the need for informal socializing in work designs and increased emphasis on two-way communication. Group processes and relations became important aspects of managerial training and it was implied that knowledge and skills, applicable to this area, existed. Sofer (1972) concludes, "From studies of the sort pioneered by the Mayo group sprang the emphasis on the worker as a group member which has dominated in organizational sociology since 1940" (p.81).

"Yankee City" and "Interactionism"

The Anthropology Department at Harvard University, although not primarily concerned with industrial studies, produced noteworthy contributions in the 1930s. A mammoth anthropological study carried out in Newburyport, Massachusetts, known as the "Yankee City" study, had, as an important off-

spin, an industrial monograph, *The Social System of the Modern Factory*, primarily focussing on a crucial strike which occurred in the community in early 1933. In his analysis of the situation, W.L. Warner *did*, in fact, establish the links between the strike and social and economic conditions; technological advances in the shoe-making industry had led to unemployment and wage-cuts and had, in addition, adversely affected workers' status in the community.

Conrad Arensberg, who also initially worked with the "Yankee City" data, invented what came to be known as "interactionism", a method which played a role in facilitating the transition to the technological implications approach. This initial work was in association with Eliot Chapple. "Group life, they argued, is created by contacts, or interactions, between organisms ('including men')" (Rose 1975, p.148). Study using this approach was based on observing frequencies of contacts and sequences of interactions and the detection of regularities and patterns. The method proved difficult to use because it turned out that the problems of recording interpersonal acts in a comprehensive way, were substantial, even in a laboratory. However, as Rose points out, the method had a positive side through encouraging investigators to "steep themselves in the ongoing life of industrial plants as a whole" (*ibid.*, p.151). Emphasis was also laid on careful attention to relevant interpersonal activities, and, importantly, this extended to contacts with managers, supervisors, union officials. Observation of interaction would now have to lead to a realization that these were influenced by other features of the work-place such as layout of machinery, production processes in use and organization of tasks - in fact, the technological element.

Kurt Lewin and "Field Theory"

A final group of workers who fall within the ambit of the human relations movement are Kurt Lewin and his fellow psychologists.

Lewin was a German psychologist who arrived in the United States in 1933, a refugee from Nazism. In Germany Lewin had been associated with the Berlin Gestalt group of psychologists whose influence can be traced in his work, especially in his important development and extension of "field theory". "He emphasized as causal elements in behaviour social and psychological forces bearing on the person insofar as they were immediately operative on and in him at the time of that behaviour. Key elements in the social field of the individual were the groups of which he was a member or to which he aspired" (Sofer 1972, p.84). In short, the individual's behaviour was the product of forces operating on him. Any behaviour was then regarded as a change in the state of the relevant field or "life space" of that individual. The "life space" referred to "the person together with his psychological environment *as this existed for him*" (*ibid.*, p.84), and a similar formulation existed for a group. Lewin also insisted that the field influencing a person should be described in the person's own subjective terms and not objectively by the observer, a point which was taken up by later "Action" theorists. Field theory thus emphasized that any behaviour was the outcome of many factors and much of an investigator's task lay in identifying the elements and in assessing their relative significance. However, Lewin held that, as a point of departure, the features of a situation *as a whole* should be examined rather than isolated elements.

Lewin and his co-workers produced valuable research, especially in the area of *leadership*. Their studies pointed to "(1) what seemed to be the greater efficacy of democratic (participative) than other forms of management and (2) what seemed to be the greater efficacy of decisions backed by group agreement and group support than individual edict" (*ibid.*, p.90). Lewin and his associates conducted classical leadership studies between 1938 and 1947. A study by Lippitt and White, the first report of which appeared in 1940, looked at the relationship between group behaviour and leadership style in a boys' club. Autocratically led groups demonstrated hostility, aggression and dependence on their leader; the laissez-faire group showed disorganization and, overall, the democratically led groups seemed to achieve social and work goals best. This was a key finding.

During the war Lewin himself carried out a set of pioneering experiments in decision-making. Working with housewives' food-buying patterns, Lewin showed that decisions made collectively by a group were more likely to change behaviour than decisions imposed from above. Lewin now argued that group membership and identification in shared decision-making were the forces which held a group steadfast in their decided course of action. The application of these ideas in an industrial environment was carried out at a manufacturing plant owned by the Harwood Manufacturing Corporation of Virginia. "The findings supposedly established that if managers involved difficult employees in the planning and execution of technical changes the employees' antagonism to change would be overcome" (Rose 1975, p.163). More specifically, Bavelas, a Lewin associate, demonstrated the positive influence of granting workers more control over their output and allowing them participation in goal-setting. J.P.R. French, another

associate, introduced a leadership training programme incorporating group problem-solving and addressing itself to problems of obtaining co-operation.

Kurt Lewin was also one of the founders "of the method for learning about processes in small groups widely known as 'group dynamics training'" (Sofer 1972, p.46). A central element of this approach is the well-known T-group technique of participant observation for learning about aspects of group membership. The idea is to examine the various relationships acted out in group interaction, from the viewpoint of other members as well, in order to gain insight into group functioning.

In assessing the influence of Lewin's work, it is clear that the mark it has made is substantial, especially with regard to examining behaviour in organizations. His field approach has encouraged investigators to "enumerate if crudely the totality of forces bearing on a situation before trying to analyze a problem in detail or suggesting remedial action" (*ibid.*, p.97). An important aspect of this method was Lewin's insistence on giving credence to a person's own view of the world around him even if the investigator's interpretation of "reality" is different.

Lewin and his associates were undoubtedly pioneers in leadership studies, in particular their work in participative decision-making.

Lewin's laboratory-style experimental methods also acted as a lead in human study. He argued for the reliability of using laboratory-based experimental designs for organizational study : *fundamental patterns* of behaviour could be reflected in small experimental groups, although real-life parameters could not all be included. Lewin also

advocated the conducting of experiments in collaboration with business managers and administrators, for example, in testing various leadership styles.

Group dynamics training with its central notion of the significance of group membership is still a popular practice, owing its beginning to Lewin. The same may be said of many course contents involving an assessment of decision-making and the democratic versus authoritarian debate : the influence of the Lewin studies remains a major one. "More clearly than anyone else has he (Lewin) shown us in concrete operational terms what it means to be a democratic leader and to create a democratic group structure" (G.W. Allport as quoted in Sofer 1972, p.90).

However, despite the "new vistas of techniques and substantive findings" (Sofer 1972, p.101), some very real criticisms can be levelled at Lewin and his co-workers. He is seen to fall prey to the familiar shortcomings of neglecting in-plant power strata and not taking into account wider extra-plant social factors. Environmental factors receive almost no mention at all. A further accusation is also that his methods of problem solution relied on the manipulation of people, for example, T-group training should increase a leader's competence in gaining co-operation from his work-groups. One other area of criticism is that of his experimental design, a highly specific area, which merits attention but cannot be dealt with in detail here. Finally, an area which left considerable work to be done by others is the actual *internal workings* of a group, about which Lewin says little. Outcomes are related to treatments but the intervening area remains empty.

Before examining the inheritors of the human relations mantle, some mention must be made of one institution which

was particularly influenced by Lewin's ideas and the Harwood findings: the Survey Research Center (S.R.C.) of the Institute of Social Research at the University of Michigan, to which his Research Center of Group Dynamics moved from the Massachusetts Institute of Technology. "The aim of the S.R.C. was to integrate the efforts of psychologists, sociologists and anthropologists involved on the study of groups - an aim almost identical with that of the Tavistock Institute of Human Relations founded in Britain at the same time and with which it maintained close links" (Rose 1975, p.164). (More will be said about the Tavistock work in a later section.) The S.R.C. again set to work investigating supervisory tactics and related worker behaviour in studies of clerical workers and railway gangs. These studies supported the view of a successful supervisor as one who abstains from closely supervising men when not necessary, is prepared to exhibit interest in workers' personal problems, is willing to assist during rush periods and is more disposed to using persuasive than punitive methods. However, as Rose so clearly points out, the danger of *reversed causality* can be seen in these studies; for example, can one be sure that relaxed supervision is not, in fact, an *effect* of high production rather than a cause? Similarly, high morale may be "the precondition, if not the precise cause, of a democratization of leadership" (*ibid.*, p.165). The S.R.C. workers were not uncritical of their work and their findings began to suggest that studies of the work group and its leader needed to be extended. Doubts also began to occur about the value for managers of encouraging cohesive groups; cohesive groups could, in fact, be a divisive influence in an organization at times.

Etzioni (1964) sums up the impact of the human relations movement, "There are few social science studies and insights that have received more attention or were more widely

reported in popular literature and in the trade manuals than these experiments (Hawthorne and Lewin's) and the conclusions Human Relations drew from them" (p.38). The human relations movement had emerged in many ways diametrically opposed to the conceptions of scientific management. Management now had to be "enlightened" and put into practice techniques such as encouraging group development and providing democratic, participative leadership. Inherent in this view is the assumption that once workers' social needs in informal group life are met, there is no reason for organization life not to be free from conflict. But, as have been enumerated, the criticisms launched against this movement have been severe. And, as Silverman (1970) points out, much of this criticism has been accepted by the *organizational psychologists*, who followed in the footsteps of the human relationists, extending their work and re-introducing the dimension of organizational structure.

3.5 ORGANIZATIONAL PSYCHOLOGY

The school of writers grouped together under the umbrella of "organizational psychology" became an important influence in the 1950s, especially in America. Organizational psychology is in many senses the successor to the work of Mayo and his colleagues and can, in fact, be seen as the "neo-human relations" school, a term first used by Goldthorpe.

In reviewing the work of these writers, a typology will be used which was originated by Schein (1965) and later followed by Silverman (1970); the contributions will be grouped in terms of "Social Man", mentioned in the human relations section, "Self-Actualizing Man" and "Complex Man".

Social Man

As pointed out, a conception of man as Social Man emphasizes his participation in human groups and his need for acceptance by his fellow workers. Beyond the classic Hawthorne studies, several theorists have continued to concentrate attention on man's "social" needs.

Homans (1950) continued the argument that man was a *social* person in the work-place and tended to form cohesive groups. Conflict resolution rested on granting workgroups participation in decision-making. Continuing on this, J.A.C. Brown (1964) points to a worker's need to be "treated as a human being" and asserts that a firm could meet this need. Brown also acknowledges that workers could be primarily motivated by monetary rewards, and divides these people into two groups : a small group who are self-sufficient and a group who are "unattached and *miserable*" comprising "the group of neurotic men or women who want to '*belong*' but, for various reasons, fail to do so" (p.192, as quoted in Silverman 1970, p.79). Silverman criticizes this view : Brown neglects the group of workers who "derive their social satisfactions outside the workplace" (*ibid.*, p.80), and Silverman links this neglect to the influence of Mayo.

Zaleznick is a recent writer who is identified by Silverman (1970) and Schein (1965) as focussing on the worker's social needs and on small workgroups. His central argument remains that "man desires, above all, the satisfaction to be gained from close interpersonal relations" (*ibid.*, p.80). The fact that small work groups satisfy these needs is seen as integral to the organization's survival and an understanding of group membership is essential if the formation of individual attitudes is to be understood. Zaleznick's conclusions were supported by work he had carried out with

his colleague Roethlisberger (Zaleznick *et al.* 1958) in a medium-sized manufacturing company. Their results had shown that "both productivity and satisfaction of the workers were unrelated to the pay and job status which the individual received, but were related to group membership" (Schein 1965, p.60). From a conclusion of this nature, it is particularly clear that small advance had been made on the conceptions of the human relationist. However, A.H. Maslow's theory of motivation now introduced a significantly new dimension.

Self-Actualizing Man

A.H. Maslow (1954), in his now famous theory of motivation, argued that man's needs were, in fact, *hierarchical*. The lowest level in the hierarchy is *physiological* needs which are necessary to sustain life. These include food, water, clothing and shelter. When physiological needs are fulfilled, *safety* needs begin to be influential; a common safety need would be protection from physical danger or a need for economic security. *Social* needs come next. These are the needs for acceptance by one's peers and friendship, which were stressed by the human relationists. When physiological, safety and social needs are satisfied, *esteem* becomes dominant. This need centres on a feeling of personal importance supported by recognition from others. Recognition is an invaluable element in the satisfaction of this need. Finally, the pinnacle of the hierarchy is *self-actualization*, which Maslow saw as the "desire to become more and more what one idiosyncratically is, to become everything that one is capable of becoming" (1954, p.46). This level represents the individual's attempts to realize his full potential for fulfilment and development. Maslow went on to say, "In actual fact, most members of our society who are normal (*sic.*) are partially satisfied in all their basic needs and partially unsatisfied in all their basic needs at the same

time. A more realistic description of the hierarchy would be in terms of decreasing percentages of satisfaction as we go up the hierarchy of prepotency" (1943, as quoted in Hodgetts 1975, p.312). Silverman (1970) points clearly to the problems of Maslow's formulation, asking whether it is merely a model or whether the needs proposed are, in fact, "real". And, if they are real, one is faced with the problem of validating their existence. However, directly or indirectly, many psychologists have used Maslow's scheme.

Douglas McGregor, in his *The Human Side of the Enterprise*, acknowledges Maslow's contribution; he posits three major classes of needs : physiological, social and self-fulfilment. Self-fulfilment is particularly important and conventional management frustrates its realization. In addition, opposition to management and its edicts arises from a reaction to lack of satisfaction of these needs, especially the higher-level needs. The assumptions about man which underlie this form of management McGregor characterizes as "Theory X" assumptions. These are :

> "1. People inherently dislike work and, when possible, will avoid it.
>
> 2. They have little ambition, tend to shun responsibility, and prefer to be directed.
>
> 3. Above all, they want security.
>
> 4. In order to get them to attain organizational objectives it is necessary to use coercion, control, and threats of punishment."
>
> (McGregor 1960, pp.33-34.)

He then goes on, "the principles which comprise the bulk of the literature of management *could only have been derived from assumptions such as those of Theory X*. Other beliefs about human nature would have led inevitably to quite

different organizational principles" (*ibid.*, p.35). Theory X has thus existed for years and management, since the time of Taylor, has only been able to partially reduce economic hardship and improve working conditions; the fundamental theory of management has remained unchanged.

However, the growing body of human behaviour research findings cannot be explained on these assumptions. McGregor puts forward his "Theory Y" based on "integration" rather than control. Its assumptions are :

> "1. Work is a natural phenomenon and if the conditions are favourable people will not only accept responsibility, they will seek it.
>
> 2. If people are committed to organizational objectives they will exercise self-direction and self-control.
>
> 3. Commitment is a function of the rewards associated with goal attainment.
>
> 4. The capacity for creativity in solving organizational problems is widely distributed in the population and the intellectual potentialities of the average human being are only partially utilized."
>
> (*ibid.*, pp.47-48.)

Rose (1975) holds that, "Theory Y, in fact, is more of a programme than a theory" (p.189), and McGregor uses it as a basis for analyzing an alternative way of running an organization. Certainly this conception of man is a long way from Taylor's "machine"; management must now no longer direct people but "must seek to create opportunities for their self-fulfilment" (Silverman 1970, p.83), using participative leadership, job enlargement and similar techniques.

A further American psychologist who "views prevailing organizational structures as self-defeating and unacceptable" (Rose 1975, p.189) is Rensis Likert. Likert is confident that the insights of psychology can be successfully used by management and proclaims, "Managers with the best records of performance in American business and government are in the process of pointing the way to an appreciably more effective system of management than now exists" (Likert 1961, p.1). Extensive research had shown that business departments with low production tended to have "job-centred" supervision, keeping workers engaged in work according to prescribed methods and times - an approach clearly derived from Taylor. In contrast to this, high production was linked to "employee-centred" supervision; Likert explains this form of supervision : "Supervisors with the best records of performance focus their primary attention on the human aspects of their subordinates' problems and on endeavouring to build effective work groups with high performance goals" (*ibid.*, p.7). He continues to, in fact, distinguish four systems of management. System 1 represents the *exploitative-authoritative* type where management relies on threats and coercion, has little confidence in the employees and seldom allows them any part in decision-making. At the other end of the scale is his System 4, characterized by *participative-democratic* management. This system involves the use of decentralized decision-making using group participation; communication flow upwards, downwards and between peers is good; and superiors and subordinates interact in an atmosphere of trust and confidence. The decentralized decision-making process is integrated into the formal organization by a series of overlapping groups with each group linked to others through persons who are members of more than one group. These persons are referred to as "linking-pins" and their role is extremely important : it encourages participation to be practised throughout the organization. System 4 management

is seen as producing higher levels of performance because the use of effective, cohesive work groups accommodates workers' "major motivational forces", promoting a sense of involvement and co-operation in working towards organizational goals. Likert also mentions another aspect of successful management, namely, *sensitivity* to the values and expectations of employees and dealing with them with these in mind. Further, Likert points to a number of measures which are available to objectively assess organizational variables. Factors such as extent of employee loyalty, motivation levels and adequacy of the communication process can be measured and can facilitate problem-solving in the organization.

Both Likert and McGregor are writing largely for a management audience and their work carries the consequent highly prescriptive tone. Nevertheless, their work is certainly an advance from the ideas of human relations; structural change in the organization is more readily considered, especially by Likert, and man's personality needs are no longer characterized as unidimensional. However, as has been pointed out, validation of these assumed needs remains a thorny issue.

Chris Argyris, for many years Professor of Industrial Administration at Yale University, represents one of the more sophisticated writers of this school. Argyris begins with "an assumption that human being are need-fulfilling, goal-achieving unities. They create various types of strategies to fulfil their needs and to achieve their goals" (Argyris 1959 as quoted in Rose 1975, p.190). The needs he refers to resemble those discussed, for example, the need to feel "a sense of competence", to feel self-esteem and to receive "confirmation" of one's self-image. However, Argyris argues that self-realization is frustrated by the way in which organizations are usually run, although he does grant that the *cultural environment* will affect the expression of these

needs and their potential satisfaction.

The first aspect of this problem concerns an individual's development to maturity. The model proposed by Argyris is one where man progresses from infant passivity to adult activity, from dependence towards relative independence, from behaving in a few ways to behaving in many, from shallow, ephemeral interests to sustaining interests, from short time perspective to long time perspective, from a subordinate position in family and society to a position of equality, from lack of self-awareness to attainment of self-awareness and self-control. In short, one moves from self-centred, irresponsible childhood to a position where one is able, as an adult, to accept responsibility. "With such development goes the possibility of full and constructive release of psychological energy" (Pugh *et al.*1964, p.136). However, in *typical formal* organizations,passivity, dependence and "the frequent use of a few skin-surface shallow abilities" (Argyris 1960b, p.267), are expected and there is a consequent "*lack of congruency between the needs of healthy individuals and the demands of the . . . formal organization*" (*ibid.*, p.267). This will lead to the individual experiencing feelings of conflict, frustration and failure and mature individuals will respond by creating informal activities which may be antagonistic to achieving organizational ends, for example, restricting quotas. This unfavourable situation is caused by three major variables : the formal organization, directive leadership and managerial controls.

Argyris now links organizational success to the availability of *psychological energy* derived from individuals with high levels of self-actualization and this must be taken into account by managers : "If these properties of psychological

energy are valid, then the administrator may not ignore individual self-actualization" (ibid., p.275). An organization which meets this demand "must provide opportunities for work in which the individual is able to define his immediate goals, define his own paths to the goals, relate these goals to the goals of the organization, evaluate his own effectiveness and constantly increase the degree of challenge at work" (Argyris 1964, p.33), and Argyris outlines a tentative model for a new organizational structure. SystemsTheory, with its stress on the *interrelationship* of organizational parts, forms an underpinning for his proposals. (SystemsTheory will be introduced more fully later.) In these future organizations interpersonal competence and emotionability will be increasingly necessary and the organizations will also have to assume the role of educators, encouraging people towards their own self-actualization. Management's role will be crucial : they will be required to be "deeply committed to human growth" (Meadows 1979, p.8) in an atmosphere of trust and respect, aiming at the full development of individual potentialities. Argyris also hopes that future organizations may be capable of rapid adaptation, involving different structures for different purposes and further facilitating the integration of individuals and organizational success.

Knowing what really *motivates* people can be seen as a critical problem for management. One writer who tried to provide some answer to this question is Frederick Herzberg. Herzberg (1959) based his proposals on an extensive interviewing programme of two hundred engineers and accountants, carried out in the late 1950s in the Pittsburgh area in America, aimed at assessing what factors made employees happy or unhappy on the job. Analysis of the data showed that negative feelings were associated with *environmental* factors, such as inadequate salary, poor

supervision or unpleasant working conditions, which Herzberg called *hygiene* factors. If these did not meet some minimum requirement people would be dissatisfied, but they do not motivate people. On the other hand, the factors that made men feel good about their jobs were the actual *motivators*, clearly related to self-actualization, which include factors such as recognition, achievement, advancement, responsibility and the possibility for growth. However, other workers have uncovered results which are not in agreement with Herzberg's proposals. Hygiene factors, such as salary or job security, have been found to be motivators in some cases for blue-collar workers and workers have been found to not always judge the same factors to be motivators or hygiene factors. Vroom, whose contribution is mentioned later, has argued that Herzberg's conclusion is, in fact, only one of many that could have been drawn from his research.

Some comments on these organizational psychologists can now be made. To begin with, Silverman (1970) points to their extension of the positivist approach. "Positivism is often associated with the explanation of human behaviour as a *direct reaction* to an external stimulus : thus, for instance, a non-social factor such as a technical system may be thought to produce, by itself, a given pattern of behaviour" (Silverman 1970, p.87, my italics). McGregor, however, makes the important point that "human behaviour is seldom a *direct* response to objective reality, but is rather a response to the individual's perception of that reality" (1966, p.216, as quoted in *ibid.*, p.88). This assertion has the important consequence of directing an investigator's attention to the individual's *orientation* to a situation as well as the objective "facts" of the situation. Silverman continues this argument by mentioning, as Argyris does, that the existence of some intermediate variable must be assumed which "mediates" between the external

structures and the behavioural response. Argyris holds that this intermediate variable is human personality and its needs. However, this position again brings up the question of a validation of these needs : one cannot directly prove their existence. In addition, this concentration on psychological needs obscures the possible explanatory power of a more sociological approach which would attempt to "locate (the ends and expectations actually held by certain actors) in their social situation both within the organization, and outside it" (*ibid.*, p.85).

Criticism of these writers can again be directed at their concern with management-orientated questions. Efficiency and profitability can be promoted by better managerial practices; conflict will remain dormant as the needs of the individual and the needs of the organization will co-exist in a state of harmony. Overall, however, as Rose (1975) mentions, they are certainly far more critical of management practices than were their predecessors and their remedial schemes are more sophisticated and extensive.

This sophistication is very clearly reflected in their use of a perspective based on a *Systems* approach. Argyris, for example, considers such system activities as goal-attainment and the maintenance of internal equilibrium to be at the core of organizational functioning. Likert, on the other hand, conceptualizes organizations as systems of inter-locking groups. However, their particular perspectives concentrate on links between individuals and the organizational components - the effect of the environment and any comparison between organizations do not receive much attention. Other writers have also used a systems perspective, perhaps more explicitly, but have also incorporated a more complex view of man's needs.

Complex Man

Edgar Schein and Warren Bennis are two social psychologists who have argued for a shift away from Maslow's need hierarchy. Schein (1972) argues that there are many motives arranged in some sort of hierarchy of importance, but this hierarchy is "subject to change from time to time and situation to situation" and, furthermore, "motives interact and combine into complex motive patterns" (p.70). Besides initial needs, man can also learn new motives from his organizational experience. Schein also holds that, "Man's motives in different organizations or different subparts of the same organization may be different" (*ibid.*, p.70). The implied managerial behaviour, says Schein, is that a successful manager must be a "good diagnostician" and must be sensitive enough to investigate the variability of motives in his subordinates. This has the consequence that *flexibility* becomes increasingly important for the manager; he must be skillful enough to vary his own behaviour to treat subordinates with different motives and needs in different but appropriate manners. Using traditional managerial principles or simply concentrating on being employee-centred is not necessarily incorrect, but "any of these approaches may be wrong in some situations and with some people" (*ibid.*, p.71).

Silverman (1970) sees this argument to be based on criticisms of Argyris and McGregor voiced by Bennis (1966). Bennis also points to the fact that the idea of human needs is empirically unverifiable. Furthermore, satisfaction of the needs of individuals and organizations, he believes, cannot be mutually maximized through the use of managerial techniques; at best some compromise is attainable, and he prescribes "rational problem solving" as the best way to

combat inter-group conflict.

The system approach can be seen explicitly in the work of both Schein and Bennis. Schein maintains, "Organizational psychology as a field is intimately tied to the recognition that organizations are complex *social systems*, and that almost any questions one may raise about the determinants of human behaviour within organizations have to be viewed from the perspective of the entire social system" (1972, p.3, my italics). Schein conceptualizes organizations as *open systems* in constant interaction with the environment through the processes of *input*, *transformation* and *output*; materials, people, energy and information are taken in and transformed in the organization into products and services which are moved back into the environment. The organization itself "consists of many subsystems that are in dynamic interaction with one another" (*ibid.*, p.115) and are mutually dependent. This has the very important consequence that individual behaviour cannot be seen in isolation but must be analyzed in terms of such subsystems. Another important consequence is the emphasis on the fact that the organization exists in a "dynamic environment" that "places demands upon and constrains the organization in various ways. The total functioning of the organization cannot be understood, therefore, without explicit consideration of these environmental demands and constraints" (*ibid.*, p.115).

In considering organizational effectiveness, Schein says, "Acknowledging that every system has multiple functions and that it exists within an environment that provides unpredictable inputs, a system's effectiveness can be defined as its capacity to *survive*, *adapt*, *maintain* itself, and *grow*, regardless of the particular function it fulfils" (*ibid.*, p.118, Silverman's emphasis). Schein points out that Bennis shares this conception of effectiveness criteria

and proposes three similar "criteria of health" : "adaptability", "a sense of identity" and "capacity to test reality" (Bennis 1962, p.273). A fourth criterion can be added: "integration", by which is meant that organizational parts are not working at "cross-purposes". Argyris, as has been mentioned, sees as crucial the integration of individual needs and organizational goals. However, a systems perspective has its inherent shortcomings which are often not recognized by these writers. (More will be said of these later.)

One further psychologist merits brief mention in this section : Victor Vroom.

Vroom made it very clear that the level of analysis with which he was concerned was that of *individual* behaviour. He formulated a theory of work motivation built around the concepts of *valence*, *expectancy*, and *force*; the basic assumption is that "the choices made by a person among alternative courses of action are lawfully related to psychological events occurring contemporaneously with the behaviour" (Vroom 1964, pp.14-15). His basic concept of force or motivation can be expressed as :

Motivation, force = Σ Valence x Expectancy.

Motivation equals the algebraic sum of valence and expectancy. "By valence Vroom means the strength of an individual's preference for a particular outcome" (Luthans 1973, p.490). If the valence is positive, then the individual prefers attaining that outcome to not attaining it. *Instrumentality* also operates in the valence concept : this operates with first- and second-level outcomes; for example, Luthans quotes the case of a person desiring promotion but realizing that superior performance is a

strong factor in attaining promotion. The person would then be motivated towards superior performance (first-level outcome), which is seen as instrumental in achieving promotion (the second-level outcome). The other variable in the equation is expectancy, which is "the probability (ranging from 0 to 1) that a particular action or effort will lead to a particular *first-level* outcome", whereas, "Instrumentality refers to the degree to which a first-level outcome will lead to a desired *second-level* outcome" (*ibid.*, p.491). Vroom is essentially interested in examining the aspects within an organizational setting which lead to either satisfaction or dissatisfaction and his model, although complicated, is meant to assist management to analyze workers' motivations; he does not prescribe specific techniques or solutions. Luthans (1973) points out that much research still needs doing to fully validate Vroom's model, but its appeal lies in its recognition of the complexity of human motivation and its improvement on the over-simplifications of Maslow and Herzberg.

In attempting to evaluate the contribution of the organizational psychologists, it is essential to see their relative position in the historical and theoretical development which the author has attempted to trace in this chapter.

The study of work organizations and behaviour has through time drawn the attention and efforts of administrative and management theorists and, in addition, of more empirically oriented sociologists and psychologists. The first group looked at were the Classical Theorists, including such theorists as Weber and Fayol, who considered the formal aspects of organizational structure and functioning and produced prescriptive "recipes" for managing work organizations. Their work represents the embryo stage of

organization study. Bennis (1959) has described their work as concerning "organizations without people"; the human element was minimized. Scientific management developed as a response to Taylor's perception of inefficiency in American early twentieth century industry and its prescriptions do not go far beyond the manager-worker-technology nexus within the plant; the worker was crudely characterized as an isolate, machine-like and greedy for monetary reward. Human relations broadened the bounds of organization theory by "discovering" informal groups and workers' need for participation in interpersonal interaction in the job situation. However, their approach tended to concentrate on this aspect of organizational functioning to the extent that Bennis feels confident to characterize their concern as being with "people without organizations". Power relationships, political considerations and a comprehensive account of the influence of extra-plant environment, remained factors which were not granted their due significance. However, within the limits of their interests all these workers established landmark contributions to an understanding of organizational life. This is despite the considerable experimental shortcomings of many of the studies and the lack of replication or comparative study.

The organizational psychologists continued the work of the human relationists and considerably extended it. In the writers who subscribe to a conceptualization of man as "Social Man" one can see a clear reflection of the thinking of the human relations school; social needs are seen as of overriding importance. Formal structure is de-emphasized. A departure from this tradition begins with the notion that man's motivation is not as simple but that, in fact, he has a spectrum of needs requiring potential fulfilment. The workers who Bennis characterizes as "the revisionists", Argyris and McGregor in particular, began to see the

importance of organizational demands and began to see the inter-relatedness of the actual organizational structure and the informal human organization, a departure from the Hawthorne workers' mistake of not considering the formal structures. It was beginning to be realized that the various aspects of organizational life could not be studied in isolation, but that an analytical scheme had to be formulated which would take into account the inter-relatedness of organizational phenomena in order to reach a comprehensive understanding of organizations and their human participants, as a whole. Thus Bennis and Schein, among the organizational psychologists, shift away from examining inter-relations only to a conceptualization of organizations as *systems*.

A systems frame of reference does indeed represent a sophisticated and comprehensive scheme and, as an analytical tool, is extremely powerful in explaining organizational activities and their relative role within the total, functioning organization. The advantages are very real in comparison to many previous, more limited formulations and this scheme has, in fact, become widely used in contemporary organization theory; Silverman (1970) goes as far as saying that organization theory is now in the clutches of a "Systems orthodoxy". Before turning to the next group of writers, some of whom have developed a sophisticated System scheme, a brief look at the Systems approach should provide a measure of explanatory background.

Organizations as Systems

The natural systems of the sociological functionalists and the rise of General Systems Theory provided the foundations for a systems approach in organization study. Functionalism emphasizes the similarities between biological and social

structures with the consequent needs for survival and adaptation and a stress on inter-relatedness of processes. General Systems Theory "aims to point out the similarities among disciplines and to develop theoretical models which are applicable to the different fields" (Rice and Bishoprick 1971, p.165).

"Most simply stated, a system consists of a patterned, functioning relationship among components . . ." (*ibid.*, p.163). Applied to organizations a systems view begins by seeing the organization as composed of a set of inter-connected, interdependent components or subsystems in some kind of hierarchy. Rice and Bishoprick quote the example of an inventory system (comprising men and machines) which is part of a bigger product system. The product system could have numerous subsystems, for example, inventory, budgeting, safety. The product system is, however, also part of a larger system, the manufacturing system, which is part of the even larger company system, and thus the hierarchy continues. The important area of study is the *process* through which the various parts or subsystems are *related*. Furthermore, an organization as a system is attributed system needs and the ability to take the action to satisfy these needs.

Organizations as systems also interact with their *environment* and other social systems in that environment. As has been seen in this chapter, organization theorists have dealt with the influence of the environment in different ways, often inadequately. Three approaches are possible : organization can be viewed as closed systems, partially-open systems or open systems.

In a closed-system approach extra-organizational factors are ignored and the system is considered to be isolated from the

environment in which it exists. "Influence from outside the system is considered to be nonexistant, or at the most insignificant" (*ibid.*, p.164). However, this view is "clearly deficient from a systems perspective" (Silverman 1970, p.32); interactions across the organization boundaries are an integral part of a system perspective. Silverman also notes an organizational member reacts to his own particular definition of reality which arises from interactions within and outside the organization; this factor further points to the mistake of excluding a consideration of extra-organizational factors.

A partially-open system view admits the influence of environmental factors, but focuses in preference on factors within the organization. Typically a study using this perspective would only take external variables into account at a later stage in the study, often to explain inconsistencies. This view has the obvious shortcoming of not giving external influences their due significance and can prevent a clear understanding of their relationship to factors within the organization.

"An open system, on the other hand, permits interaction of components across the outer boundaries of the system" (Rice and Bishoprick 1971, p.165) and introduces the influence of the environment into analysis. This clearly allows the environment to be related to explanations of system problems and behaviour within organizations. The patterned activities of an organization are now seen in terms of *energic input*, *transformation of energies within the system* and *resulting product or energic output* (Katz and Kahn, 1966). Schein's formulation can be seen to be similar. Taking a factory as an example, the raw materials and human labour comprise the energic inputs, the patterned activities of production the transformation, and the

finished product the output. For the activity to be sustained an inflow of energy is required and this is provided by the return received on the products - and the *cycle* can now be repeated. However, this import must be more than the energy expended in the transformation process if the system is to survive, a law called the law of *negative entropy*. Open systems are also characterized by *feedback* from the environment constituting information input about environmental conditions and the organization's functioning relative to them. This feedback allows the organization to make appropriate adjustments or to correct malfunctions and thus maintain a *steady state* or *homeostasis*, a state of dynamic equilibrium. The basic principle underlying a homeostatic steady state is "*the preservation of the character of the system*" (Katz and Kahn 1966 in Emery (ed.) 1969, p.97). Finally, "open systems are characterized by the principle of *equifinality*, which asserts that systems can reach the same final state from different initial conditions and by different paths of development" (*ibid.*, p.103, my italics).

Katz and Kahn (1966) point out, "Traditional organization theories have tended to view the human organization as a closed system. This tendency has led to a disregard of differing organizational environments and the nature of organizational dependency on environment" (*ibid.*, p.103). An open systems position, however, allows researchers to give attention to perceivable aspects of the organizational environment and to examine the effects on organizational structure and human behaviour. Organizational forms can now be related to, for example, different types of technology, as is the case in the work of Joan Woodward, who saw technology as a crucial influence.

Woodward is one of an important school of writers who were

working at much the same time as the organizational psychologists and shared many of their concerns. This school of writers encompassed an important revision : ". . . *technology* supplanted the human relations climate as the favourite variable for explaining industrial behaviour" (Rose 1975, p.175, my emphasis), and, one might add, for explaining organizational structure. And a systems perspective emerged clearly in the important conceptualization of organizations as "Socio-Technical Systems".

The next chapter will examine the work of these writers - writers who have focussed on the role of technology in the organizational context.

CHAPTER FOUR

TECHNOLOGY AND ORGANIZATIONS - 1

Peter Drucker, in his book *Technology, Management and Society*, states his belief that technology in the twentieth century, through its developments of radically new methods applied in new areas and the accompanying ". . . tremendous rise in the volume of work . . ", has become ". . . central in war and peace . . ." and has manifested its ability ". . . within a few short decades to remake man's way of life all over the globe" (1970, p.48). And, indeed, technology of one form or another and in one setting or another, has stimulated sometimes hyperbolic accounts from the purveyors of fact and fiction, reflecting this belief in its central status in industrial society. An interest in the influence of technology in organizations emerged clearly in the 1950s as an important and enduring focus in organization studies. Certainly, technology in the organizational setting merits the "keen debate" it has aroused; it remains a crucial area of requisite understanding for any industrial administrator, an understanding which must encompass the insights of those writers who have looked at "technological implications".

Taylor's scientific management aimed at improving work techniques and individuals were required to adapt to the new work methods; scientific management represents one of the earliest examinations of technology. The human relationists, as has been seen, centred their attention on social factors and, for many of these writers, organizational structure and technology in the work-place were de-emphasized. However, running parallel to the work of the organizational psychologists, "The 1950s saw the resurrection of technology

as an important variable in the study of social organizations" (Jackson and Morgan 1978, p.176). The influence of technology on other important aspects of the organization, such as structure and human behaviour, led directly to an interest in the actual inter-relationships between these organizational variables, an interest which found its most sophisticated expression in the conceptualization of organizations as systems and, more particularly, as Socio-Technical Systems. And the systems perspective has, in fact, endured as an analytical model, a fact pointed to by Child and Mansfield (1972) in the introduction to their important recent study : "Recent literature on organizational behaviour suggests that most researchers in the field consider that an organization may be characterized as an open socio-technical system" (p.371).

However, a concern with technology has, for some writers, stopped short of the development of a comprehensive systems scheme; their focus has remained at the more limited level of merely analyzing the links between various forms of technology and types of worker behaviour and attitude, but their work remains an important step towards understanding the influence of technology in organizations, and is well worth mentioning.

4.1 TECHNOLOGY AND THE WORKER

W.F. Whyte

Whyte's work facilitated the transition from the human relations perspective to the technological implications approach and has, in fact, been identified as being on the "border line" between the two schools.

Whyte (1959a) begins by pointing to the fact that human relations training programmes, with their emphasis on skills of interpersonal relations, have produced disappointing results. This is seen as partly due to the training programmes having "too narrow a base of operations", and he suggests, "We must look beyond the immediate interpersonal situation to study the 'environmental factors' that are shaping it" (Whyte 1959a, p.5). Whyte's organizational analysis is couched in the framework of "interaction theory", based on the work of Chapple and Arensberg and, more particularly, Homans. This analysis begins with the three concepts of *interaction*, *activities* and *sentiments*, which are mutually dependent and which can all be modified by the *environment*, an important aspect of which is technology. Interactions are seen as interpersonal contacts; sentiments are "the way individuals feel about the world around them" (Whyte 1959b, p.157), synonymous with attitudes, and activities refer to the actual physical acts performed by people. Using as examples the studies of assembly-lines of Walker and Guest (1952) and Walker, Guest and Turner (1956), Whyte uses his framework to demonstrate technology's effect : An automotive assembly line "restricts and channels interactions among the men" and the "activities of the worker are, of course, controlled within very narrow limits by the technology and the work flow" (*ibid.*, p.159). The technical situation also has a definite effect on the foreman's interaction with the men : He is inclined to move up and down the line interacting with a large number of men for short time-periods. The assembly-line environment is severe and involves work which is physically taxing and routine in nature, factors which, along with the limited chance for interaction, gives rise to "negative sentiments" towards the job. This example shows what Whyte means by mutual dependence : The technology modifies the activities which affects the interactions which

affect the workers' sentiments. Change can be introduced at any of the three points in the "interaction - activity - sentiment system" and will result in changes in the other two.

Whyte also extends Homans' scheme of environmental forces by adding the economic element. However, when discussing worker response to incentive rates, Whyte believes that a scheme involving only interactions and activities is not sufficient - he includes the concept of symbols. Workers are seen to react to the piece-rates as management-established symbols and their reaction is in terms of their past experience with "incentive symbols" and their past experience in the activities of the job. These symbols have an existence independent of the interactions and activities of the workers and Whyte sees the chain of effect as follows :

ECONOMIC ENVIRONMENT → INCENTIVE SYMBOLS → WORKER SENTIMENTS → INTERACTIONS AND ACTIVITIES

(Whyte 1959a, p.64)

Whyte adds, however, that the social system can also effect the environment. For example, worker dissatisfaction with incentive rates can eventually lead to their being altered. Whyte, in fact, examined the whole issue of incentives in detail in his book *Money and Motivation*.

In *Money and Motivation*, Whyte also addresses himself to the question of how to build co-operation between the diverse groups in organizations, especially when this co-operation is threatened by the disruption of technological advances. His suggestion to managers it to take account of social as well as technical and financial factors in their planning. This suggestion is put into practice by the manipulation of

sentiments and activities through changing interaction, "And we change interaction through changing the symbols that are presented to the people in question or through changing the work-flow or the organizational structure" (Whyte 1955, p.277). Work-flow and organizational structure are thus seen as two aspects capable of deliberate modification. In the latter case, Whyte's specific suggestions include improved grievance procedures and collective suggestion schemes for workers.

Whyte's contribution can now be clearly seen to be a significant advance on the work of the human relationists. The influence of technology on worker behaviour within the plant is "decisively thrown into the ring", as Rose (1975) puts it. And Whyte certainly also takes account of organizational structure. The value of economic incentives is also again raised as an issue. However, the influence of factors outside the plant are again not comprehensively or systematically dealt with.

One further point which one might add about Whyte's conception of the influence of technology on human behaviour, is that it is decidedly positivist in nature. In other words, behaviour is seen as a *direct outcome* of technology. However, as Silverman (1970) points out, some "intervening variable" is implied to exist "on which technology operates and which in turn influences behaviour" (p.102). This variable is seen as human personality "needs" which are assumed to be *universal*, an assumption which the organizational psychologists, such as Schein, have indicated to be problematical.

Leonard R. Sayles

Sayles (1958), in his well-known study, explicitly focused on work-groups and he states his objectives very clearly, "Our objective was to explain differences in behaviour among work-groups. We wished to discover whether certain aspects of employee day-to-day behaviour could be related to the *structure of the work group*, as determined by the technology of the enterprise, independent of supervisory skills (or their absence), management and union pressures, and individual personality variables" (p.162, Sayles' italics). The study was extensive : data were collected on 300 groups in thirty plants over four years. Sayles was primarily interested in the activity generated by grievances. It appeared that each plant had certain departments which tended to be more troublesome or more co-operative than the average, and Sayles tried to demonstrate that the characteristics of these groups were a product of the technology.

He identified four kinds of groups - *apathetic*, *erratic*, *strategic* and *conservative*. The apathetic groups tend to have few grievances, and a lack of clearly defined leadership, internal disunity and suppressed discontent. The jobs included here are relatively low skilled and low paid in comparison to the rest of the plant. The erratic groups are seen as easily inflamed, having inconsistent behaviour and capable of rapid switches to good relationships with management. Highly centralized leadership is also observed. In contrast, the strategic groups apply continuous pressure to management and their grievance activity is well planned. They are additionally inclined to be unified as a group and enduring in their participation in the unions. Usually they exhibit good production records.

Finally, the conservative groups have highly specific objectives and use restrained pressure in their effort to achieve them. They also are inclined to have cycles in their grievance-motivated activity. Sayles then points to the interesting observation that there "is a striking similarity in technological characteristics among groups that behave similarly" (*ibid.*, p.38). For example, wire drawers consistently acted as a strategic group and similar patterns were observed for welders, grinders, etc.

Sayles now turns his attention to an examination of other differences among these groups. "While it is useful to be able to identify or classify relatively durable reaction patterns on the part of work groups, the value of this type of analysis is increased substantially if it can be shown that behaviour differences are grounded in other differences among these worker aggregations" (*ibid.*, p.41). He states his belief that, in fact, any work group has a very limited range of possible reactions to a perception of unfairness or to a management-induced change; this is because he believes that "a group's behaviour in the plant is a product of its *inherent ability to function in a certain way*" (*ibid.*, p.42). And he focuses on characteristics that determine this ability. The factors explored are divided into two groups : those which relate to the status of the work itself and those which relate to "the internal structuring of the work operations".

Factors in the first group are status in the plant, work group size, internal homogeneity, essentialness of their function, degree of judgement exercised, repetitiveness of task, compactness of work area, hours of work and sex differences. The degree of grievance activity seemed to be influenced most by job status, size and importance of

the group, homogeneity of jobs, and the degree to which the work carried out is indispensable. Sayles concludes that grievance activity is most likely to occur in "middle rung job groups". These are the middle-class occupations which are seen as desirable but are certainly not the best in the plant; pay and prestige are, however, well above starting jobs.

When considering the second group of factors, Sayles concludes that the kind of pressure exerted by a work group in attempting to resolve grievances is affected, to a significant degree, by the *internal organization* of the work unit. And this internal organization is mainly a function of the work flow and the division of labour. Where a work process relies on interdependent tasks, spontaneous, sporadic grievance activity occurs more frequently, for example, on assembly lines. Where grievance activity has been sustained and involved long-term, precisely formulated, clear objectives, the work process has been inclined to comprise independent operations performed individually, although very homogeneous groups can also exhibit this form of behaviour. In explaining these observations, Sayles mentions that interdependent operations performed by a group suffer certain handicaps preventing sustained, co-ordinated grievance activities : a variety of job skills and status and associated internal disagreements can militate against collective activity; a leader is often provided who is not of any assistance in unifying the group; small, exclusive cliques tend to arise which do not easily come together into a larger unit.

Sayles now turns to the significance of technology and asserts, "Upon reflection it appears as though all of our relevant variables are related to the technological system

designed by the company to organize the work process" (*ibid.*, p.93), and he mentions variables such as the inter-dependence of tasks and the indispensability of jobs which have been shown to be important. He continues : "We recognize that many persistent industrial relations problems have their roots in the technology of the plant. We are in the habit of attributing these to individual worker and manager characteristics and to the quality of the working environment . . . However, this study suggests that the social system *erected* by the technological process is also a basic and continuing *determinant* of work group attitudes and actions" (*ibid.*, p.93, I share these italics with Rose, 1975).

Sayles also attempts to clarify the "underlying motivations" for the characteristic kinds of grievance actions observed. He points out that "technological factors are really *enabling conditions*. They do not explain what sets off a spate of aggressive activity, what brings it to a halt, and what are the personal motivations involved" (*ibid.*, p.94, Sayles' italics). Constant comparison between groups of their relative incomes, status and work conditions is seen as a constant potential initiator of action. Similarly, any threat to a group benefit or to group security can be a major influence. The success a group has or has not experienced in past bargaining situations will also have an affect : prestige gained from past benefits won will provide impetus for further activity.

Sayles' contribution is particularly interesting in the light of the main-stream human relationists. Sayles himself, points out that, "Perhaps we have come a full circle in the field of personnel relations" (*ibid.*, p.4). The scientific management influence embodied the assumption

that efficiency and maximized output could be achieved by re-thinking engineering considerations such as job designs and work methods. And, in contrast, the human relationists had turned their attention on to the human element, maintaining that factors such as personal identification, morale and informal group membership were more important than "the specifics of engineering". However, Sayles now concludes, from his study, that "the technology of the plant . . . molds the type of work groups that evolve within the plant" and continues, "We have known with some assurance for more than twenty years, since the Western Electric studies, that the work group shapes the beliefs and behaviour of its employee members. Now it would appear that the technological structure of the organization, in turn, exerts a major influence on the source of motivation and morale, the work group" (*ibid.*, p.4, my italics). Sayles acknowledges that human relationists have been criticized for their "failure to study informal groups in the setting of the larger formal organizational structure. It is argued that there has been an over-emphasis on interpersonal and even intragroup relations as isolated phenomena apart from their dependence on the total environment" (*ibid.*, p.161). He expresses the hope that his shift in emphasis "from concentrating on the informal group to the relation of work group behaviour to the technological and organizational setting" (*ibid.*, p.160), will have contributed to answering these criticisms. And it cannot be denied that Sayles has significantly expanded the limits of the human relationists' perspective.

This is additionally true of his basic method of approaching work groups. A work group is no longer seen as merely part of a unidimensional informal structure, but is examined in greater detail. From an analytical viewpoint,

Sayles suggests that seeing groups in terms of friendship cliques, work teams and pressure or interest groups, is more useful. His particular emphasis has been on the last group type, an emphasis which has encompassed the important recognition that perceived conflicts of interest *do* exist in organizations. He adds that "these interest groups are not static self-preservation societies. Rather they are engaged in *active pursuit* of the economic welfare of their membership" (*ibid.*, p.150, my italics). The role of the work group is thus certainly no longer merely the satisfaction of social needs. In criticizing the human relations stance, he says that this study has shown that, "In some instances these interest groupings can move the plant toward *disequilibrium* rather than toward the snug harmony and balance envisioned by Mayo and his followers" (*ibid.*, p.170, Sayles' italics).

However, there remain distinct problems in Sayles' formulations. To begin with, a recognition of the importance of technology as a major influence certainly is important, to characterize it as the "determinant" of group behaviour is another matter altogether. Sayles seems to again subscribe to a positivist or determinist view of technology : technology determines behaviour. Sayles does add one qualifier when he talks of the role of "underlying motivation". However, possibly the most perturbing shortcoming is Sayles' tendency to ignore *extra-plant factors* as possible sources of motivation. This lapse would prevent any perception of any source of grievance which originates outside the plant, for example, rivalry which is based in community life. Sayles used a comparative system of analysis to great effect in this study and it is obvious that his results would never have been obtained in a case-study situation, but his tendency

to view the organization without any regard to factors outside the plant remains a substantial limitation. Finally, one might add that Sayles was certainly concerned with giving advice to managers and administrators : "Another objective of this study is to provide the tools of prediction for administrators who must deal with work groups in large organizations . . . By being able to identify *in advance* the work groups that will support or attack management or union programs, the administrator gains a major tactical advantage" (*ibid.*, p.3, Sayles' italics). By being sensitive to trouble areas, the manager can direct his talents to nip impeding "complications" in the bud. The "internal dynamics" of the plant can also be manipulated to produce "more satisfactory" work group behaviour. One must point out that Sayles believes that union officials can equally make use of this knowledge, but, nevertheless, the tendency to promote the use of social scientific knowledge to control workers remains evident.

Charles Walker and Robert Guest

Unlike Sayles, Walker and Guest were less interested in actual behaviour in the work-place. Their landmark study, published as *The Man on the Assembly Line* in 1952, essentially examined worker attitudes to an assembly-line technology work environment. The central question they asked is : "To what degree can - or should - men be 'adjusted' to the new environment of machine, and to what degree is it possible to adjust or rebuild that environment to fit the needs and personalities of men?" (Walker and Guest 1952a, p.250). In other words, Walker and Guest were looking at the relationship between the technology and the workers' sense of satisfaction or dissatisfaction :

". . . we shall emphasize how an assembly line *looks* and *feels* to the men who work on it . . ." (*ibid.*, p.250, my italics).

As they point out, previous to their study very little systematic investigation had been carried out in an assembly-line situation manufacturing a complex product such as an automobile. Their research took the form of a case study : 180 automobile assembly workers in a "Plant X" were interviewed over a period of months. They began by establishing the well-known features of assembly line work : it is mechanically paced, repetitive, has low skill requirements, permits work only on a fraction of the product and greatly limits social interaction on the job. Generally, Walker and Guest found that the workers disliked the machine-paced, repetitive work. A correlation was established between interest in a job and the variety of operations it involved : the more operations the job involved, the more interest was expressed in it. A minority of workers, however, exhibited indifference to or even preferred repetitive work and Walker and Guest find no explanation beyond suggesting that the reason lies "in the pattern of their individual personalities" (*ibid.*, p.256).

The affect of the technology on the social relationship among the workers is also carefully examined. A worker on the line works independently of others and the lay-out of the line and the noise prevents communication with anyone except the men immediately around him. "It is clear that the present technology of an automobile assembly line limits social interaction and does not lend itself to the arrangement of men in bona fide teams or crews" (*ibid.*, p.260). A minority of off-line operators worked as cohesive groups

with interdependent tasks and exhibited a great deal of conversational interaction. The social relationship between supervisors and workers was found to be friendly and informal and contact was frequent. Criticisms of foremen were rarely aimed at individuals, but usually at the "line" and its pressure on the foreman. Walker and Guest quote one worker as saying : "I guess you'd say the foreman gets along with the men. But they don't need a foreman. *The line is the foreman.* You have to keep up with the line." (*ibid.*, p.260, Walker and Guests's italics). They also point to the scarcity of contact between the workers and managers above the foreman level, which they compare to more frequent conctact observed to occur in another plant where operations required a greater degree of skilled work. Their conclusion : "Thus the basic factor which determines the rate and quality of worker-supervisor interaction is the technology of mass production" (*ibid.*, p.260).

The ~~man~~ mass-production system also has a definite affect on wage structures : differentials between wage grades tend to be narrowed and more than half the workers in the production department received exactly the same hourly rate. On the other hand, wages earned in a ~~man~~ mass-production factory are generally higher than in other sectors of industry; the pay was sometimes as much as 50 percent more than workers had been receiving in previous work. And, indeed, three-quarters of the men said that they worked at Plant X primarily for the high pay. The fact that work represented a secure job was another reason quoted. However, although the pay was above general levels, the mass-production situation presented poor promotive opportunities. Walker and Guest point out that, because of this, the average Plant X worker does not aspire to progress to a

slightly better job but rather into one of the off-line jobs, such as a repairman's, "where he can be recognized, and where also he can recognize himself, as an individual" (*ibid.*, p.261).

The legacy of the human relations thinking is clear in Walker and Guest's conclusions. The effect of the technology, acting through its molding of the social interaction, the pay and promotion systems, is to increase the worker's sense of anonymity. Walker and Guest accept as a basic assumption a worker's need to be a member of a cohesive work group. For example, they say of the role of union membership : "Our evidence showed that to some extent membership in a union gave the worker the feeling of personal identity and 'belonging' which neither the shop nor relations with management supplied" (*ibid.*, p.261). As Rose (1975) points out, "By now the pattern of thinking underlying this study should be clearer. Technology can prevent the formation of true work-groups and this frustrates the worker's natural urge for social attachments" (p.185). The consequence of this is that the worker is left feeling "oppressed" by his sense of anonymity.

Walker and Guest do, however, offer a number of suggestions to management for "constructive action". "The answer to this problem in the most general terms would appear to be a program designed to re-create the sense *and also* the reality of a bona fide work community" (*ibid.*, p.261). More particularly they suggest introducing features such as job rotation and job enlargement which would reduce monotony but also increase social interaction. Job rotation involves the alternation of jobs between workers which would imply that each worker would need to learn to accomplish a number of jobs, but Walker and Guest maintain

that the rewards of this method for a worker outweigh the additional effort required. However, beginning job rotation as an experiment is recommended. "Job enlargement is simply the recombining of two or more separate jobs into one" (*ibid.*, p.258). Again they recommend this be experimentally tried in the automobile assembly industry in the interest of reducing boredom for the workers. And they believe that there are few plants where management could not introduce substantial improvements in assembly line design.

Walker and Guest's findings concerning worker attitudes in a mass-production technology environment certainly proved to be an immensely important contribution to the developing field of industrial studies, but their particular area of interest remains fairly narrow : it is limited to the assembly line situation and actual worker behaviour receives little attention. Furthermore, their work is not situated within any clear theoretical framework and no more comprehensive formulation is attempted. Their particular interpretations also raise certain questions. To begin with, their reliance on the value of teamwork in the work place implies a very limited view of man's needs, very much in the "Social Man" vein. Extensions of this narrow conception have been presented by several of the organizational psychologists. And, as Silverman (1970) reminds one, as soon as one regards man's needs as "problematic" and not simply given, then the explanations of the role of technology can be very different from those proposed by Walker and Guest. In the light of this, the potential effectiveness of the remedies suggested is also open to some doubt, although it does seem evident that these certainly have the ability to substantially reduce actual work monotony.

Robert Blauner

Robert Blauner (1964), moving on from the work on assembly lines, looked at what he calls workers' "alienation" in a range of industries employing various technologies. He describes his investigation as "an attempt to demonstrate and to explain the uneven distribution of alienation among factory workers in American industry" (p.6). While recognizing that other features of the work situation are influential, Blauner states explicitly : "The most important single factor that gives an industry a distinctive character is its *technology*", by which he means "the complex of physical objects and technical operations (both manual and machine) regularly employed in turning out goods and services produced by an industry" (*ibid.*). And Blauner identifies technology as the primary "cause" of alienation, maintaining that some technologies are more alienating than others.

Blauner distinguishes four dimensions of alienation often experienced by manual industrial workers. "Basic to each one is the notion of fragmentation in man's existence and consciousness which impedes the wholeness of experience and activity" (*ibid.*, p.32). The first kind is *powerlessness*. This implies a work situation where the worker is open to manipulation and control by others but has no power to alter his position. *Meaninglessness* is associated with merely being a "small cog in a big wheel" - the individual's roles seem to bear no relation to the total, overall goals of the organization. The third alienation type, *isolation*, stems from "the feeling of being in, but not of society, a sense of remoteness from the larger social order . . ." (*ibid.*). No sense of membership of or belonging to a community in the work place

is experienced. Finally, *self-estrangement* results when work does not contribute positively to a sense of personal identity or to a building of self-esteem - activity becomes only a means to some future end rather than a fulfilling end in itself.

Blauner then attempts to assess the degree and nature of the alienation experienced by workers in four separate types of industry, each employing a different technology mode, namely, craft-production, machine-minding, ~~man~~ mass and process-production. To begin with, the printing industry, with its craft-centred technology, provides a work environment which is not conducive to alienation. The printer uses a range of special skills and his work is not subdivided. Plants tend to be relatively small without elaborate hierarchical chains of command and workers are largely free from management pressure. The kinds of operations are, in fact, such that the worker is free to set his own pace and choose his own techniques - his control over his working conditions is further enhanced by strong union activity. Job security is ensured by favourable market conditions. The printer experiences a sense of pride in and identification with his work, and, in addition, has plenty of opportunities for socializing on the job. In contrast, mass-production, as exemplified by the automobile assembly line, is characterized by extremely alienated workers. This is what one would expect from the work by researchers such as Walker and Guest, whom Blauner quotes as stating that the assembly line has become "the classic symbol of the subjection of man to the machine in our industrial age" (*ibid.*, p.89). The worker is confronted with a highly compartmentalized job requiring a minimum of skill and over which he has little control. Furthermore, social interaction is very limited. All in all, their work provides little opportunity

for self-fulfilment and "Assembly line workers, in general, and automobile workers, in particular, are more subject to the alienation of meaninglessness than workers in other industries" (*ibid.*, p.107). The features of a process-production situation, however, are again able to counteract alienation. Automation transfers a worker's focus of emphasis from an individual job to the process of production. The worker's perspective now encompasses a broader series of operations and his role changes from providing skills to accepting responsibility. Because of the integrated and continuous nature of the process, areas of responsibility tend to be linked, leading to increased worker interdependence. Automated plants thus tend to be based on team operations. Also : "Communication between workers and management representatives is more frequent and is especially likely to be two-way communication in which advice is sought, as well as orders given" (*ibid.*, p.146), but the actual load of supervision tends to be light - all factors which contribute to the formation of a "cohesive industrial community". And Blauner argues that these foster a sense of loyalty and belonging. A process technology worker, for example, in a petro-chemical plant, faces a dynamic and diverse work environment - the need to deal with crises and novel job situations which arise provides the worker with an interesting and challenging job. It is thus clear that the conditions and requirements of the automated process technology do, overall, include many features which are inherently fulfilling and can provide workers with opportunities for learning and growth.

When considering the textile industry, which employs a machine-minding technology, Blauner points out : "Technology and economics contain strong alienating tendencies, but there are important features of the industry that further

social integration and counter self-estrangement (*ibid.*, p.58). In a textile mill, highly mechanized power machinery, particularly semiautomatic spinning frames and automatic looms, carries out the basic production process. "The job of the typical worker is to mind or tend a large number of spinning frames, looms, or similar machines" (*ibid.*, p.59). This is essentially a low-skill job requiring little knowledge, experience or training, because the manual skills have been built into the machine system. Because the actual work tends to be physically light, women are attracted to it. Blauner points out that in 1960 more than 40 percent of all employees in the textile industry in the U.S.A. were female. However, women tend to be concentrated more than men in the lowest-skilled jobs. In contrast to the craftsman in the printing industry, a textile worker finds himself with little control over his immediate work processes : he is unable to control the pace and rhythm of his work activity, to choose his work techniques or to vary his sequence of operations. "The mass of operatives in machine-minding industries do repetitive tasks on a fairly standardized product; there is then no technical necessity for decision-making" (*ibid.*, p.69). Supervision is usually close and arbitrary in its application. Because the machine technology does not fully control workers' activities, supervisors police the workers, ensuring that work loads are carried out - workers are thus under considerable pressure. Furthermore, the work is "fractionized" and workers lack a variety of operations : "it is difficult for textile workers to feel that they play an important part in the company's total scheme of production" (*ibid.*, p.73). Market conditions also make for insecurity of employment. It can thus be seen that "In the textile industry, technology, work organization, and economic

conditions are all powerful alienating factors" (*ibid.*, p.74). Despite this, discontent is, surprisingly, not common among the millworkers and a high degree of loyalty to the company characterizes the textile industry. Blauner begins to explain this by pointing to the social cohesion in the mills. Most mills are situated in small, isolated towns and villages, "where the family and the church are dominant institutions and where traditional patterns and social relationships that reflect the isolation of both the region and the village community still prevail" (*ibid.*, p.75). And it is community-based attachments which integrate the work force; kinship, religion, and community loyalties appear to reinforce feelings of identification with the mill. The workers also exhibit few subjective signs of self-estrangement despite the intense objective powerlessness of their situation. Blauner explains this in terms of lack of aspiration in their traditional backgrounds; they simply do not expect work to be interesting and repetitive work is not seen as monotonous.

Blauner definitely sees technology as the major influence in determining attitude and behaviour patterns in the work place. He says that technology "determines the nature of the job tasks performed by blue-collar employees . . . It is *primarily* the technological setting that influences the worker's powerlessness . . . Technological factors are *paramount* also in their impact on self-estrangement . . . Since technological considerations often determine the size of an industrial plant, they *markedly* influence the social atmosphere and degree of cohesion among the work force. Technology also *structures* the existence and form of work groups, in this way influencing cohesion . . . And technology *largely determines* the occupational structure

and skill distribution within an enterprise" (*ibid.*, p.8, my italics). However, as pointed out by Rose (1975), the textile workers present something of a problem. It appears that out-plant factors can, in fact, neutralize objective alienation. And, indeed, this casts some doubt on Blauner's "technological determinism". Rose now believes that "it obliges us to abandon the whole conception of alienation as a property of industrial environments rather than of the prevailing socio-economic formation as a whole" (1975, p.208). Rose also maintains that measurement of a complex concept such as self-estrangement would require carefully constructed, detailed scaling devices, whereas Blauner relied for his information on a job-attitude poll carried out some dozen years earlier which had asked questions concerning general work satisfaction, interest, and so on. As far as Rose is concerned, "all the poll really demonstrates is that workers in different industries expressed varying amounts of satisfaction with their work when questioned by a pollster" (*ibid.*, p.209).

The question is again raised concerning the mediating variable between technology and the individual. Despite his contradictory findings with the textile workers, Blauner never really emphasizes the potential explanatory power of workers' orientations which they bring to work from the community. As Silverman (1970) reminds one, Blauner's conception of an "objectively alienating condition" contains the implicit assumptions of what *ought* to be satisfying in the work place, for example, having a measure of control over one's work or exercising a variety of skills - assumptions which are clearly influenced by writers in the vein of Argyris.

Blauner's own particular sphere of interest was limited to

alienation and its industrial roots, but, nevertheless, in his work he undoubtedly distinguished important objective differences between various industrial forms. However, it was left to other writers to attempt to formulate a general scheme which would allow for the integration of technological and socio-psychological factors. The writers referred to relied on an *open systems* model of organizations and applied their formulation in several important studies - attention will next be turned to their work.

4.2 SOCIO-TECHNICAL SYSTEMS

The writers considered up to this point in this chapter have all been concerned with examining the effects of various types of technology on worker behaviour and attitudes. And there is no doubt that the contribution by researchers such as Sayles or Walker and Guest has been of fundamental importance in directing attention to issues in the ongoing debate about the role of technology in organizations. However, their formulations stopped well short of a Systems scheme, a scheme which stresses examination of the inter-relationshipsbetween the diverse organizational dimensions such as technology, organizational structure and member attitudes, and also stresses the role of environmental factors. It was members of the Tavistock Institute of Human Relations in England who first presented a different and apparently superior model through which to approach organizational analysis : they saw the organization as a "Socio-Technical System". "The concept of a socio-technical system arose from the consideration that any production system requires both a technological organization - equipment and process layout - and a work organization relating to each other those who carry out the

necessary tasks. The technological demands place limits on the type of work organization possible, but a work organization has social and psychological properties of its own that are independent of technology" (Rice 1958, p.4). Because of the interlinking between these major components, the technological system and the social aspects, change in one will automatically cause change in the other. "The whole system can now be perceived as a 'socio-technical' system and its total effectiveness will depend on the balance achieved between the social and the technological components" (de Board 1978, p.96).

The Coal Mining Studies of Trist and Bamforth

The concept of socio-technical systems was introduced to organization studies by Trist and Bamforth in their research in British coal mining. Their results were first published in an important paper in 1951 : "Some Social and Psychological Consequences of the Longwall Method of Coal-Getting". After the nationalization of British coal mining in 1948, mechanical methods were increasingly introduced which significantly altered the traditional form of coal mining. Trist and Bamforth, who had spent eighteen years as a coal miner himself, spent two years investigating the effects of this changed technology.

In the traditional "hand-got" system the basic unit was a small team of about six self-selected men. Each team was multi-skilled and each member could perform all the tasks required at the face. These tasks logically divided themselves into a three-phase cycle : (1) preparation, cutting the fresh coal from the face; (2) getting, actually removing the cut coal from the face; and (3) advancing, moving forward the tools and roof supports to the next stage.

A three-shift system was used and the groups would allocate two of its members to each shift, but the group was responsible for the whole cycle of operations : "A primary work-organization of this type has the advantage of placing responsibility for the complete coal getting task squarely on the shoulders of a single, small, face-to-face group which experiences the entire cycle of operations within the compass of its membership" (Trist and Bamforth 1951, p.345). The tools used were fairly simple, comprising mainly hand tools and pneumatic drills at a later stage. The working pairs would each be allocated working places from six to eleven yards in length at the face and the workers could stop whenever they decided as supervision was internal to the group. The first line supervisor acted more in a service relationship to the group than in any directive capacity. Furthermore, each group of six colliers concluded its own wage contract with management and the group divided its remuneration among its members as it saw fit, taking experience or other variations into account. Underground working also has its particular characteristics : there is the darkness and the ever-present danger as well as the problem of geological formations which impede progress. Taking these into account, Trist and Bamforth conclude : "The small group, capable of responsible autonomy, and able to vary its work pace in correspondence with changing conditions, would appear to be the type of social structure ideally adapted to the underground situation" (*ibid.*, p.347).

However, in order to exploit advances in mechanization, principally new coal cutters and conveyor belts, the "longwall" method of mining was introduced. Working was now carried out on a single face 180 - 200 yards in length and the team places were done away with. In addition, this

brought with it "a work relationship structure radically different from that associated with hand-got procedures" (*ibid.*, p.350). A shift-cycle of 40 - 50 men, along with their shot-firers and supervisors, was introduced, and each shift was responsible for a specific, specialized task. On the first shift, the coal was cut and then dislodged with explosives. The next shift loaded the coal onto conveyors and set the roof supports. The final shift moved the conveyors forward and enlarged the access to the coal. The entire coal-getting process was thus completed once every twenty-four hours. It is thus clear that this new method of working (the "longwall" method) was certainly a great departure from the traditional method of single-place, team-centred working. The familiar balance was severely disrupted : "The psychological and sociological problems posed by the technological needs of the longwall system were those with respect to which experience in the industry was least learnt, and towards which its traditions were anti-thetical" (*ibid.*, p.350). As opposed to small, self-regulating groups, where each man experienced a sense of close interdependence with his fellows, with each group working at its own station, the situation had altered to 40 - 50 men, who did not know each other, all working on one long coal face. And the entire shift was now engaged in a single task; a worker was no longer multi-skilled but was trained in only one of the several roles required for the cycle.

This new system soon gave rise to dysfunctional consequences. The revised shift system allowed little chance for social integration, even between members of the same shift, and group cohesiveness and the formation of a team spirit were profoundly hindered. Instead of the old contract method, a complicated wage system was devised based on an array of

different criteria, for example, yardage, tonnage, number of operations, and so on. In addition, the specialized task system demanded closer supervision by managers - and this incursion was profoundly resented by the miners. This supervision was now necessary, however, because unless a shift completed its work, the next shift would be faced with work it was both unable and unwilling to do. "This organization of work made for conflict within and between groups rather than the sense of interdependence which was needed if the system was to function smoothly" (Brown 1967, p.47). Men were forced to continue the work of another group of men on whom they were thus dependent, but whom they did not even know. Competition grew up within the shifts for the best work places and shifts tended to blame each other for any problems encountered. This situation was certainly a long way from the harmonious, traditional system and the men began to show the consequent evidence of emotional strain, with feelings of passivity and indifference. Absenteeism and sickness increased, and there was the establishment "of a norm of low productivity, as the only adaptive method of handling, in the contingencies of the underground situation, a complicated, rigid, and large-scale work system, borrowed with too little modification from an engineering culture appropriate to the radically different situation of the factory" (Trist and Bamforth 1951, p.367).

The conclusions reached by Trist and Bamforth did not yet include a developed socio-technical systems model. However, their study pointed very clearly to the social and technological structures in an organization and their inter-relationship - and acted as a lead to extensive further study. They conclude as regards the longwall method : "It seems to the present writers, however, that

a qualitative change will have to be effected in the general character of the method, *so that a social as well as a technological whole can come into existence*" (*ibid.*, p.368, my italics).

The "Socio-Technical Systems" Approach

The actual formulation of the socio-technical systems model for organizations thus did not occur until after Trist and Bamforth's basic study, but their observations focussed on the central elements of this model. From their analysis of the relationship between the technological and social structures, the concept of organizations as "socio-technical systems" developed.

As has been mentioned, the major components within an organizational system are judged to be "the technological aspects, concerning the machinery, the particular method of working, and the social aspects that involve the interpersonal relations between the employees" (de Board 1978, p.96). Emery and Trist (1960), in their definitive paper, placed these components in an open-systems model derived from the notions of von Bertalanffy (1950). The characteristics of open systems possessed by the enterprise are identified : enterprises grow "by processes of internal elaboration and manage to achieve a steady state while doing work, i.e. achieve a quasi-stationary equilibrium in which the enterprise as a whole remains constant, with a continuous '*throughput*', despite a considerable range of external changes" (Emery and Trist 1960, p.282). The appropriateness of an open systems concept is further underlined by looking at what is actually involved in attaining this steady state. To begin with, the existence of the enterprise depends on

regular commerce in products and services occurring with other enterprises and people in the external environment. For this to continue, it implies that the enterprise has the necessary "material supports" for its activities - materials, machines - and the necessary organized human labour. The commerce of the enterprise is further influenced by a "broad range of independent external changes" which affect product markets and the inputs of labour or material required for functioning. In coping with these vagaries the enterprise will undergo internal adjustment and will be, within limits, self-regulating. A vital component in this process is the technology : ". . . the technological component, in converting inputs into outputs, plays a major role in determining the self-regulating properties of an enterprise. It functions as one of the major boundary conditions of the social system of the enterprise in thus mediating between the ends of an enterprise and the external environment" (*ibid.*, p.284). The technology represents a type of "internalized environment". Because of this key mediating role, this open systems concept is referred to as the "socio-technical system", as opposed to simply the "social system" of the enterprise. Moreover, the technology, in the process of "accommodation" to external forces, makes demands on the internal organization. "Such a productive system therefore requires detailed attention to both the technological and the social components" (*ibid.*, p.284). This assertion is seen as direct criticism of the human relations over-emphasis of the social and psychological and the relegation of technology to the status of background information.

The enterprise may have a large number of tasks which are performed at the same time, but any organization or part of

an organization, is seen as having one "primary" task. This is defined as the task the system must carry out if it is to survive. For a business firm, speaking generally, this task is to make profits as pointed out by Rice (1963). Brown (1967) summarizes Rice's argument as follows : "Such tasks can be defined with varying precision, and the more precise the definition, the greater the constraints on task performance - thus the decision to produce certain goods for a certain market sets limits to the form of organization and technology which must be adopted. The organization of an enterprise should be that which is most appropriate to the achievement of the primary task, and the function of the enterprise leadership is to control both the internal conditions and the boundary conditions, the form of exchange between the enterprise and its environment" (Brown 1967, p.44).

The advantage of this analytical model is reflected in its directing attention to the two areas often neglected in industrial studies : the interrelationship of social structure and technology and the relationship of the industrial organization to its environment. However, as Brown (1967) points out, the use of this open systems analogy raises a few problems. There is, as usually with systems perspectives, the danger of reifying the organization. This is reflected in statements such as : "the *system itself* exerts forces towards the creation and maintenance of fixed relations between its elements in spite of variation in the rate of exchange with the environment" (Rice 1963, p.262, my italics). The notion of a "primary task", besides its fairly obvious use to an industrial consultant at work within an enterprise, is also open to objections when applied to a social organization. These objections are much the same as those

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Trist and a group of researchers carried out further studies in the north-west Durham coalfield between 1955 and 1958. This programme continued to be concerned with "the interaction of technological and socio-psychological factors in industrial production systems . . ." (Trist *et.al.* 1963, p.289) and was published as *Organizational Choice*.

These researchers were provided with the opportunity of investigating the comparison between conventional longwall mining and an innovation in work organization, referred to as the "composite longwall method". "In the composite longwall system, the different organizational pattern removes the difficulties which stem from over-specialized work roles, segregated task groups, and lack of cohesion in the face team as a whole" (Trist *et al.* 1963, pp.290-291). The composite group comprised forty-one self-selected men for a shift cycle. They shared out the preferred and disliked tasks among themselves and, as important, they received a bonus to be shared equally in addition to the basic wage. In important ways, this method re-established the characteristics of the traditional mining method : To begin with, once a shift completes its shoft task, it can carry on with the subsequent task and any shift can take up the operation cycle where the previous shift left off. Miners are again able to use a variety of skills, when required, on a variety of tasks. The self-selection procedure re-established the possibility for interdependent relations within each shift and throughout the three shifts. And the common pay-note made the team as a whole responsible for all the work.

Trist and his co-workers carried out two intensive studies between a composite team and a conventional team; and between two composite teams, one being more composite than the other. Rose (1975) sums up the results : "In sum the composite group produced more, went absent less, maintained their cycles, sometimes even forging ahead of them, and also expressed higher work satisfaction" (p.214). Comparison of the variably composite teams supported this finding as the more composite group had produced slightly more and were absent less. Management relations were also improved with the composite team.

The explanation of these results can now be undertaken within the socio-technical systems model. The technology of the organization sets constraints on the social organization, but this has certain independent properties. However, "It is the goodness of fit between the human work organization and the technological requirements that ultimately determines the efficiency of the whole system" (Trist *et al.* 1963, p.294). There is a further dimension as well : the economic. "A socio-technical system must also satisfy the financial conditions of the industry of which it is part. It must have economic validity" (Rice 1958, p.4). But this dimension essentially only "measures the effectiveness with which the human and technological resources are used to carry out the primary task" (Trist *et al.*, 1963, p.6). Given these characteristics and requirements, the socio-technical system concept indicates that an enterprise, through use of its structural and functional components, copes with environmental demands *in various and specific ways* in attaining a steady-state; this is the property of equi-finality. This formulation now acts as a clear guide to organizational choice : a work group form can be *chosen* which best meets the requirements for the balancing of these factors to optimize system functioning. Trist *et al.* (1963) demonstrated that such a choice was possible by their introduction of a composite work group, which took both the technological characteristics and the socio-psychological dimension into account. Additionally, the economic component was satisfied : productivity increased with operation of the new social arrangement.

Rice and the Ahmedabad Experiment

Rice (1958), in his work carried out in India in the mid-fifties, provided a further example of the application of

an open socio-technical systems model to organizational analysis. The introduction of automatic weaving looms had given rise to many problems in a textile mill in Ahmedabad and Rice was called upon, as a consultant, to investigate the situation. He outlines his systems approach : "In the experiments, attempts were made to take into account both the independent and interdependent properties of the social, technological and economic dimensions of existing socio-technical systems, and to establish new systems in which all dimensions were more adequately interrelated than they had previously been" (Rice 1958, p.4).

Rice uses, as his starting point, the concept of the "primary task", which he sees as follows : "Each system or sub-system has, however, at any given time, one task which may be defined as its *primary task - the task which it is created to perform*" (1958, p.32, Rice's italics). His analysis of the organization revolves around this concept and the two questions :

> "What is the primary task?
> "How well is it performed?"
>
> (*ibid.*, p.33)

The characteristics which Rice sees as essential in the task organization are :

> "1. *A task should be so organized that those engaged on it can experience, so far as is practicable, the completion of the 'whole' task . . .*
>
> 2. *A task should be so organized that, so far as possible, those engaged upon it can control their activities . . .*

3. *Related tasks should be so organized that those performing them can have satisfactory relationships."*

(*ibid.*, pp.34-35, Rice's italics)

And Rice held that work groups should be organized to maximize the realization of these requirements.

The Jubilee Mills at Ahmedabad had introduced an experimental shed containing 224 automatic looms, but the expected rise in output had not occurred; output did not differ significantly from that of the non-automatic section. The experimental shed operated on a shift-system with each shift comprising twenty-nine workers, performing twelve different occupational roles. Practically all the men worked on their own and reported individually to the shift-supervisor. To further complicate matters there was a complex pay system and two further functions inspection and production study, were carried out by external departments.

As pointed out by de Board : "This situation contradicted many of the assumptions and principles previously conceived of by Rice" (1978, p.99). Although the tasks were interdependent, the workers were concerned with separate activities and there was no co-operation. No groups existed with clearly defined boundaries which could allow commitment to a primary task; and satisfactory relationships could not be formed among the workers. In addition, each worker tried to achieve a "special relationship" with the supervisor, a factor which increased the group fragmentation.

Rice himself, with the assistance of management, now introduced changes. He identified groups of roles and

tasks in relation to the primary task of keeping the looms working and matched a group of worker skills to this scheme. A group of seven workers was now found to be capable of managing a group of sixty-four ~~teams~~looms. In addition, one of the members now acted as a leader. A further important change was the rationalization of wage structure - now with only three grades. "This reorganization was spontaneously and enthusiastically accepted by the men and despite some setbacks led to an increase in efficiency and less damaged cloth" (Brown 1967, p.48). Managerial relationships in the shed were also greatly simplified as only the group leaders were now responsible to the supervisor. A similar re-organization of the non-automatic weaving was carried out, beginning with an experimental shed and subsequently spreading to other sections of the mill. Again new norms of performance and earnings were established with accompanying significant increases in productivity.

"These changes succeeded, it is claimed, because they led to the adoption of work organization appropriate to the tasks to be done" (*ibid.*, p.49). Performance of a "whole" task by the more autonomous work group is seen as the source of increased work satisfaction. However, this does not suggest that "work group autonomy should be maximized in all productive settings. There is an optimum level of grouping which can be determined only by analysis of the requirements of the technological system" (Emery and Trist 1960, p.288). And further : "Nor does it appear that the basic psychological needs being met by grouping are workers' needs for friendship on the job, as is frequently postulated by advocates of better 'human relations' in industry. Grouping produces its main psychological effects when it leads to a system of work

roles such that the workers are primarily related to each other by way of the requirements of task performance and task interdependence" (*ibid.*, p.289). This means that the worker should encounter "an adequate range of mutually supportive roles" (*ibid.*, p.289) to assist him in performing his task and carrying the stresses which arise.

The Ahmedabad results also pointed to further aspects of the management system. Management roles can also be designed in terms of a socio-technical analysis. The supervisor is shown as controlling and co-ordinating an incomplete system of of man-task relations. However, if the supervisor continually intervenes in some part of the productive work - as was the case when all the shed workers reported to him - he is likely to neglect his main function, namely, co-ordinating and controlling the *system*. After the re-organization which produced more autonomous work groups, the supervisor was, in fact, freed to perform this function - management of the system boundary conditions. This now resulted in "clearly distinct areas of command" which, since they comprised the natural task groups, had the ability to maximize their own internal control and co-ordination.

Rice's findings are also further evidence in support of the notion of "organizational choice" presented by Trist and his co-workers. The concept of equi-finality is again clearly demonstrated : the open system can achieve its steady state by a variety of paths and from a variety of initial conditions and the enterprise can exercise some choice of structure to achieve this steady state. However, because of the inter-relationships inherent in a socio-technical system, attainment of this condition requires that the needs of both the technological and social systems be

balanced - and Rice (1958) showed, in his re-design of the weaving work-organization, how these considerations could be translated into practice. Brown (1967) sums up : "These studies (Ahmedabad and coal mining) are superficially very different; they were carried out in very different industrial situations and on different continents. Nevertheless they make what are basically the same points. They clearly disprove an assertion which is still expressed at times : that the structure of work groups is determined by the system of production. They demonstrate that within the limits set by technology there may be room for very considerable 'organizational choice', and that such choices can have important consequences . . ." (p.49).

Organizations and Their Environment

The socio-technical system theorists dealt with up to this point, while taking into account the external environment, have concentrated more on the technological and social aspects of the organization. Before making further evaluative comments about the use of a systems model for organizational analysis, two contributions which have particularly concentrated on the relationship between organizational structure and *environmental* characteristics are worth briefly noting.

Burns and Stalker (1966) conducted research in several English and Scottish firms and examined a number of firms which had been operating in a relatively stable market and technical environment but were attempting to move into a rapidly changing field of technology. "We hoped to be able to observe how management systems changed in accordance with changes in the technical and commercial tasks of the firm, especially the substantial changes in the rate of

technical advance which new interests in electronics development and application would mean" (Burns and Stalker 1961, p.5). They hypothesized from their research findings that different organizational structures were appropriate for concerns working in a stable technology and environment as compared to those adapting to a rapidly changing environment. Enterprises operating in a stable environment developed an organizational structure they termed *mechanistic*. "Such a system was characterized as having a rigidly prescribed organization structure. There were well-defined tasks, and the methods, duties, and powers attached to each functional role were determined precisely. The interaction within the management system tended to be vertical between superior and subordinate - a strong command hierarchy" (Kast and Rosenzweig 1970, p.157). Mechanistic systems, in fact, resemble the "rational bureaucracy" of an earlier generation of organizational studies. However, as companies moved into the changing environment, a looser and less prescriptive structure was encountered. This *organic* or *organismic* structure was better adapted to instable conditions, when "new and unfamiliar problems and requirements continually arise which cannot be broken down and distributed among specialist roles within a hierarchy" (Burns 1963, p.48). Jobs now lose much of their formal definition; there are no clear demarcations of function; responsibilities, methods and functions are constantly re-defined "through interaction with others participating in common tasks or in the solution of a common problem" (*ibid.*, p.48). The overall purpose of the company is kept in mind by all participants and communication tends to be "lateral" rather than "vertical". And their conclusion was that firms which could not succeed in the changing environment failed because of an "inability to adapt the management system to the form

appropriate to conditions of more rapid technical and commercial change" (Burns and Stalker 1961, p.5). Burns and Stalker made the point that these forms were "ideal-types" and that they do not exist in a pure form, but rather represent a continuum along which firms can be situated.

Burns and Stalker in their study, which implies an open systems view, were indicating very clearly that an organizational structure must be adapted to the demands of the external environment if it is to function successfully. Emery and Trist (1965) later used a more explicit systems model when they considered the influence of changing environmental contexts : "In a general way it may be said that to think in terms of systems seems the most appropriate conceptual response so far available when the phenomena under study - at any level and in any domain - display the character of being organized, and when understanding the nature of the interdependencies constitutes the research task" (p.21). More particularly they are influenced by the open systems formulations of von Bertalanffy (1950).

Organizational environments have different "causal textures" and they suggest a typology which identifies four "ideal types", approximations of which are claimed to exist in the "real world" of most organizations. The first is the *placid, randomized* environment. This is the "simplest type of environmental texture" in that "goals and noxiants ('goods' and 'bads') are relatively unchanging in themselves and randomly distributed" (*ibid.*, p.24). An example given is the classical market of the economist. Small, undifferentiated organizations can exist in this environment. The next, more complicated environment demands the uses of strategy as distinct from tactics by the organization.

"Survival becomes critically linked with what an organization knows of its environment" (*ibid.*, p.25). This is the *placid, clustered* environment and organizations existing under these conditions tend to be large, hierarchical with a tendency to centralized control. *Disturbed-reactive* environments are characterized by the existence of a number of similar organizations in pursuit of similar goals. Decentralization and more flexibility in organizational structure is required to cope in this environment and decisions must be made about when to compete and when to co-operate. The final, most complex environments are the *turbulent fields*. This environment is in a state of dynamic change, which the organizations must cope with along with the properties arising from interactions with other organizations. Because of the greater uncertainty, organizations tend to require greater consensus of values among their members and a greater reliance on research and development programmes to ensure their survival.

Emery and Trist, in a similar but more complicated way than Burns and Stalker, are pointing to an organization's need to create structures which are capable of adapting to changing environmental and technical conditions. It is now abundantly clear that there is no particular, universalistic organizational structure which can tolerate all environmental and technological forms successfully. This finding was further reinforced by Woodward's studies in England, considered in the next chapter.

At this point, some observations concerning the methods of research utilized by the Tavistock workers should help to introduce some evaluative comments. The Tavistock research has usually proceeded in terms of a "professional" rather than a "pure science" model. This means beginning

with practice and practical problems and working back to theory, and then returning to improved practice. This orientation has stemmed from the fact that the Institute's researchers have often been in a consultant-researcher position to industry; for example, the Glacier project of Jacques and Rice's work at Ahmedabad. As Brown (1967) points out, this has the advantage of ensuring access to information in the organization and allows any theoretical schemes to be more clearly concerned with the specific individuals, groups and communities of that industry. Where this access includes access to the "inner councils of leaders of the organization", as Brown puts it, it is certainly valuable. Carrying out research in a consultancy role also allows the considerable satisfaction of seeing one's schemes put into practice. However, despite these advantages, a consultant is always obliged to be essentially oriented to the problems of an organization as construed by the management, as opposed to those of the trade union, the subordinate workers, the customers or others. Brown points out that certain Tavistock workers have stressed "the obligation to give primacy to the needs of the organization rather than to research needs, but how the needs of the organization are to be determined is not given careful enough consideration, and the implications of this policy for research findings, for example the possibility of management bias, do not seem to be adequately acknowledged" (1967, p.42). Concentrating on management-oriented research does not imply that the work is not carried out with the greatest scientific rigour, it merely means that any theoretical formulations would be concerned with the problems on hand and material which is not of immediate concern may be skipped over.

The case study method appears to have been the dominant

procedure adopted by these researchers, although the mining studies allowed a certain comparative element. This method certainly allows intensive examination of the functioning of particular organizations and has led to the identification of vital inter-relationships between organizational phenomena. However, as Brown reminds one : "The problem in any case study is to validate or test the explanations and interpretations put forward" (*ibid.*, p.42). Brown notes that this often occurs when a consultant's recommendations are put to the test of practice. If this leads to improved performance by the enterprise or the problems are solved, one might be led to believe that the validity of the consultant's analysis has been vindicated. "However, the successful outcome of the changes may have been due to the factors emphasized by the investigator, or to other factors, or to both, or in some cases even to a self-fulfilling prophecy" (*ibid.*, p.43). And Brown argues that, because of this shortcoming, it is essential, if organizational study is to develop, to supplement case studies with carefully controlled comparative studies. This chapter has shown the use of this approach by researchers such as Sayles and Burns and Stalker and the invaluable contribution of Woodward (1958 and 1965) was also based on a wide comparative study. Furthermore, important recent researchers such as Pugh *et al.* (1976) in their Aston programme, have further demonstrated the effectiveness of a comparative experimental design in organizational studies.

A few further evaluative comments on the use of a Systems perspective, and more particularly a socio-technical systems model, in organizational analysis can now be added to previous observations. As has been pointed out, the advantages of this approach are certainly substantial :

stress is laid on the interrelatedness of formal and informal structures as well as on factors within and external to the organization - all within a model of dynamic input-transformation-output. Moreover, it has been clearly shown that there is no one most efficient form of organization for all situations.

The limitations of a systems approach begin to become apparent when one looks at the problems which such an analysis points to - the problems of organizational "instability" or "disequilibrium". This, however, begs the question : what is a satisfactory equilibrium and for whom is it satisfactory? And as Elliott (1974) answers : "Inevitably, therefore, there has been a tendency in systems analyses of organizations to accept as given the manager's notion of what constitutes a satisfactory equilibrium, and to accept the need to control and manage the behaviour of other members of the organization, so as to maintain this equilibrium or status quo" (p.95) - a situation which can be compounded by the position of the investigator as a consultant. The explanation of what occurs in organizations is, in fact, often couched in terms of impersonal processes, for example, moving towards a steady state, and this has the unfortunate result of directing attention away from actual purposive human action. This consideration, along with the insidious management bias, in many senses tends to de-emphasize both conflicts of interest within organizations and the relevance of the actual power distributions within organizational strata. A further aspect of this tendency is that, "Systems models are fundamentally descriptions of *how* the system functions : they do not explain *why*. Why, for example, there arise fundamental conflicts of interest between sub-groups", and Elliott suggests, "For a satisfactory examination of such

questions, we would have to return to more mainstream sociology" (*ibid.*, p.95). Silverman (1970) reinforces this point : adaptation and internal maintenance are neatly explained by the Systems model but "it has considerably more difficulty in explaining *why* systems have their present characteristics and why they react in different ways, and to a varied extent, to external and internal threats to their stability" (p.120), and he argues that it is only by "reference to human motivation" that, in fact, social life and its characteristics can be explained.

Silverman develops this notion further : he states explicitly : "Organizations do not react to their environment, their members do" (*ibid.*, p.37). While a systems theorist may argue that his model can encompass the predispositions of its members as just another input to be taken into account in his analysis, Silverman maintains that this is still not a satisfactory scheme for actually explaining *why* people act as they do. The investigator would usually rely on his observation of the attitudes of the organizational participants which are seen as derived from a society's cultural system but Silverman argues, "People act in terms of *their own* and not the observer's definition of the situation" and ". . . 'objective' factors, such as technology and market structure, are literally meaningful only in terms of the sense that is attached to them *by those who are concerned* and the end to which they are related" (*ibid.*, p.37, my italics). Thus, since any *action* in an organizational setting is governed by the participants' own definitions, explanations of the organization's responses must focus on the "network of meaning" through which the participant views "reality". This argument acts as an introduction to Silverman's promotion of a new approach to organizational analysis, the

"Action" approach, which will be considered in Chapter Six. Because of this stance, Silverman holds that the "weakest part" of a socio-technical systems approach is, in fact, a failure to adequately discuss the "sources of the orientations of the members of the organization" (p.123). Discussion of environmental factors is usually limited to economically orientated features, such as market demands, and does not include adequate analysis of "extra-organizational experiences" as the source of the members' frames of reference.

Despite the reservations expressed by Silverman and others concerning the use of the open socio-technical systems model in organizational analysis, the development of this model has been, beyond doubt, "an important contribution to industrial sociology" (Brown 1967, p.43) - an importance which is borne out by the continued recognition of its effectiveness by modern researchers such as Child (1972). This importance certainly rests to a great extent on the analytical advantages of seeing an organization as a system and the consequent emphasis on optimizing the organizational functioning through sub-optimization of the important sub-systems : "The problem of relating organizations effectively and stably to the environments in which they operate is one of trying to balance the economic, technological and socio-psychological advantages", as Lupton (1971, p.67) again stresses.On the face of it, this actually might not seem to be such a surprisingly valuable proposition. However, its value is further underlined when one considers that this proposition would certainly not have come from Taylor, with his belief in the primacy of technical efficiency, or from the Hawthorne investigators with their social emphasis or even from important organizational psychologists, such as McGregor or Likert.

Lupton, in fact, refers to McGregor, Likert and Argyris as members of a group he characterizes as the "psychological universalists", because their general approach rests on the notion "that the principles and procedures evolved apply to all individual-organization relationships, regardless of particular organizations" (*ibid.*, p.98). Likert and McGregor believed that management style was the key to creating an organizational setting for maximum performance and human satisfaction, while Argyris was perhaps more convinced that organizational structure, through management manipulation, is appropriate for meeting organizational and individual needs - this all without integral consideration of the possible fundamental constraints of circumstances of size, product markets, labour markets and, of course, technology. This tendency to "universalism" was further severely questioned by the propositions of Trist *et al.* and Burns and Stalker, pointing to the fact that there is no one optimum management system; to survive an organization must have a structure adapted to the demands of its environmental context. Trist *et al.* (1963) did, however, emphasize "that although structural alternatives are limited by technology, they are by no means uniquely determined by technology" (*ibid.*, p.111) and a measure of choice of structure certainly exists - but it must be adequately adjusted to the organizational constraints. The validity of a universally applicable organizational structure and management system is further thrown into profound doubt by the invaluable contribution of Joan Woodward (1958, 1965 and 1970). Luthans (1973) maintains that Woodward's work ranks in importance with the Hawthorne studies and the Michigan studies on supervisory style. When her findings appeared they "threw advocates of theories of formal organization into some disarray", to use Lupton's words. Other studies, as has been shown, have certainly demonstrated

that technology is a crucial variable in building an understanding of organizations, but as Jackson and Morgan (1978) asset : ". . . it was not until the studies by Joan Woodward that it (technology) emerged as an 'imperative' in organizational study" (p.176). Furthermore, Woodward's work has led directly to more recent important industrial studies.

The second chapter looking at the influence of technology in organizations, Chapter Five, will focus on those writers who have examined technology as a potential organizational "imperative".

CHAPTER FIVE

TECHNOLOGY AND ORGANIZATIONS - 2

Introduction into organizational analysis of technology as the *major factor* dictating organizational structure is usually attributed to the work of Joan Woodward and her research team in the 1950s. Woodward's study was particularly important, in addition, because it incorporated a wide comparative analysis of organizations. The use of a sophisticated comparative scheme was further demonstrated by influential studies in the 1960s, the Aston and National studies particularly, which re-examined and extended Woodward's work, albeit with often different conclusions.

5.1 THE TECHNOLOGICAL IMPERATIVE

When Woodward began her research the stated aim was "to discover whether the principles of organization laid down by an expanding body of management theory correlate with business success when put into practice" (1958a, p.56). Woodward and her research team from the South-East Essex Technical College carried out a survey of the manufacturing organizations in the area from 1953 to 1957; ninety-one percent of the firms in the area with more than one hundred employees were studied. The actual size of the firms ranged from a hundred employees to over a thousand and the survey was supplemented by intensive studies of selected firms. The firms examined included many types of production, but electronic, chemical and engineering firms were prominent.

The team began by looking at staff-line relationships, but soon found that these could not be studied in isolation and consequently expanded their researches to include the entire management-supervisor structure. The information gathered included the success of the firm based on factors such as

profitability, market share, reputation of the firm and quality of management; description of manufacturing processes and methods - the technology; the extent of formalization and specification of tasks and responsibilities - the management style; and the form of the organization structure as shown by the labour structure. The "considerable variation in the pattern of organization" which was found "could not be related to size of firm, type of industry or business success" (Woodward 1958a, p.56). In about half of the firms, there had been some applications of the standard "principles" of administration, for example, lines of authority and so on. However, this conformity did not necessarily result in success or non-conformity in failure. The researchers then turned to the technology as a possible source of explanation.

And, indeed, "when the firms were grouped according to similarity of objective and technology of manufacture, there did appear to be a relation between technology and the organizational pattern or structure" (Lupton 1971, p.58). Woodward found that the objectives of a firm - the type of product made and the markets aimed at - "controlled and limited the techniques of production that could be employed" (Woodward 1958a, p.61). Woodward quotes the example : a firm which had as its objective the building of a novel prototype of electronic equipment could obviously not employ the technology of mass-production engineering. The firms in the sample were then placed in ten different categories according to their production process (technology). Woodward emphasized three major divisions into which categories could be placed with some slight overlap : small batch and unit production; large batch and mass production; and process production. The categories constituted "a scale of technical complexity", by which Woodward means "the extent to which the production process is controllable and its results predictable" (*ibid.*, p.62). For example, a chemical plant using a process

production method allows targets to be set and adhered to more easily than even the most modern mass-production engineering shops - "the factors limiting production" are simply better known in a process situation. Process production is thus seen as the most complex and unit production as the least of all.

It now "appeared that different technologies imposed different kinds of demands on individuals and organizations, and that these demands had to be met through an appropriate form of organization" (*ibid.*, p.65). And the general conclusion was that organizational patterns differed with different levels of technical complexity. Some of the associations with specific organizational characteristics that Woodward found are :

1. As technical complexity increased :

   - the number of levels of authority in the management hierarchy increased,
   - the span of control of the chief executive increased,
   - the ratio of indirect labour and of administrative and clerical staff to hourly paid workers increased,
   - labour costs dropped,
   - the proportion of graduates among production supervisors increased, and
   - the ratio of managers and supervisors to total personnel increased.

2. The span of control of first-line supervisors increased along the scale of technical complexity, reaching its peak in ~~man~~ mass production and declining again with process production.

3. There was *no* relationship between technological mode and organizational size (number of employees).

4. Within a particular grouping on the basis of their production system, the successful firms had a common feature : "Many of their organizational characteristics approximated to the median of their production group" (*ibid.*, p.71). For example, in unit production the median number of levels of authority was found to be three and a successful firm in this category would thus probably be found to have three levels of authority, rather than, say, two or four.

In Woodward's example, specialization between the functions of management was found more frequently in large-batch and mass-production. Few specialists were found in unit-production firms and the managers who were responsible for production were expected to have the technical skills. In process production firms technical competence was again important for the line managers, although the requirement was more for actual scientific knowledge rather than technical "know-how".

Woodward also found that in large-batch and mass-production the actual administration of production was most widely separated from the supervisory level of production operations. In this production mode modern techniques of production planning and scheduling, methods engineering and work study were most developed. "Thus the solutions advanced by Taylor for production efficiency seem to be adopted efficiently over a certain range of technologies, but are not universally applicable" (Lupton 1971, p.59).

Woodward also sought to incorporate Burns and Stalker's

distinction between "organic" and "mechanistic" structures into her research. She had found that organizations tended to be more flexible at both ends of the scale, that is, in unit production and process production - duties and responsibilities tended to be less clearly defined. And she likened these firms to the "organic" model as detailed in Burns and Stalker's work.

Woodward also makes some comments about the effect of technology on human relations and worker satisfaction. She says : "The attitudes and behaviour of management and supervisory staff and the tone of industrial relations in the firms also seemed to be closely related to their technology" (Woodward 1958a, p.69). At the two ends of the scale, in unit and in process production situations, human relationships tended to be more harmonious. Pressure on people appeared to be most severe in the middle of her scale in the mass-production situation and this situation is seen as most likely to produce conflict. The work of Walker and Guest on assembly line certainly provides a clear illustration of this situation. Woodward maintains that in process production factors such as relaxation of pressure, small work groups, more supervisors and "the reduced need for labour economy" (*ibid.*, p.69), contribute to industrial peace. It is conceded that some managers can "handle" their labour problems more adroitly, but Woodward believes that her findings indicate this task would be made substantially more difficult in a mass-production situation as opposed to in an environment employing one of the other technological modes.

Woodward later elaborated her work to include a typology of control processes based on technological complexity as well. However, Woodward's central argument remains that

"there seems to be a pattern of organization appropriate to the technology employed" or "the technology demands certain forms of organization for its efficient exploitation" (Lupton 1971, p.59). Nevertheless, Pugh *et al.* (1971b) remind one : "It is not claimed as a result that technology is the only influence upon a firm's organization nor that individual managers make no impression, but technology is a major factor" (p.37). An important corollary of these findings, in Woodward's own words : "There can be no one best way of organizing a business" (1958a, p.61). The prescriptive "rules" of management of the classical management theorists and many of the schemes of the organizational psychologists are certainly undermined by this finding. Management and leadership practice which is successful in one organizational milieu is not necessarily going to produce the same success in another milieu. In Woodward's sample, it was found that in the successful mass-production firms there was, in fact, a relationship between the application of "principles" advocated by early management writers and the firm's success. This can, however, be explained by the fact that many of these writers based their work on their own business experience, much of which was in large-batch and mass-production environments. However, outside this specific type of technological situation these prescriptions are not likely to find much applicability.

Woodward's work has drawn its share of criticism. Her classification of production technology has been labelled crude, and Rose (1975) believes that her data on behaviour and worker attitudes are not very useful in comparing the influence of various technologies on in-plant social structure and activities. Moreover, Woodward's establishment of the association between technological forms

and organizational structure and success is *not* explained in *causal* terms.

Woodward's contribution to the understanding of organizational functioning has, however, proved to be immensely fruitful. Her use of a wide comparative experimental scheme was, in many ways, a pioneering step, moving away from the isolated case-study format. However, her major impact remains the fact that she clearly "demonstrated that different production systems impose different constraints that set limits on the range of viable practices for organizations" (Jackson and Morgan 1978, p.179). Probably more than any other researcher Woodward was responsible for identifying technology as an organizational variable of major influence, but it was not until late in the 1960s that studies actually began to produce evidence in question or support of Woodward's stress on technology as an imperative.

Edward Harvey's research (1968) took Woodward's work as an explicit point of departure. He argued that "it is not only important to take into account the *form* of technology, as Woodward has done, but also to consider the amount of change *within* a given form" (p.249). As opposed to Woodward's scheme, he proposes a continuum from *technical diffuseness* to *technical specificity* - "technical diffuseness implies a firm in which a number of technical processes yield a wide range of products" (*ibid.*, p.249), and the more technically diffuse a firm the greater the degree of "made to orderness" in the products. This, therefore, corresponds to Woodward's category of unit production. Harvey sees the fact that products can *change* from year to year or model to model in this category as being important. Oil refineries, on the other hand, exhibit less product variation and change, and this

shift towards process production Harvey calls a shift towards technical specificity. With this scheme in mind, Harvey sets out to relate organizational technology to certain features of organizational structure.

Harvey examined fewer features of organizations than had Woodward but his findings, based on a comparative study of 43 industrial organizations, basically supported hers. As technical diffuseness decreases (or technical complexity increases, in Woodward's terms) there is an increase in organizational characteristics such as the number of specialized sub-units, the number of authority levels, the ratio of managers and supervisors to total personnel, and the amount of programme specification. Furthermore, there was again no relationship found between size and technology or between size and structure. Harvey concluded by suggesting that his findings "argue strongly for the addition of technology to the growing list of 'base variables' for the comparative analysis of organizations" (*ibid.*, p.257).

William Zwerman conducted a later follow-up study (1970) on Woodward's researches which, although little known, remains significant. Although the sample composition was slightly different and the study was made of 55 firms in the Minneapolis-St Paul area in the U.S.A., Zwerman deliberately attempted to replicate the Woodward study. Generally his findings also confirmed those of Woodward, but he did not find that the type of production technology was related to the span of control of first-line supervisors, as Woodward had. In addition, he found that firms with separated ownership and management were more likely to have more levels of management, a broader span of control at the top of the hierarchy, and lower labour costs than

were firms with combined ownership and management. The ratio of nonmanagerial supervisors to managers was further correlated with the technology mode and, finally, dependence on local markets was related to both technology and size of the labour force.

The work of Joan Woodward has certainly forced "thinking away from the abstract elaboration of principles of administration to an examination of the constraints placed on organization structure and management practice by differing technologies and their associated control systems" (Pugh *et al.* 1971b, p.43). And Woodward has also, in great detail, elaborated on the nature of the relationships between technology and specific structural variables. However, as pointed out by Kast and Rosenzweig (1970), it is important to bear in mind that, "rather than being an absolute, fixed constraint, technology allows for various adaptations in other systems" (p.167). As Woodward showed, technology does not uniformly *determine* an organization's structure - several types of structure *were found in each category of technology*. However, if an organization is to function "successfully" the management must ensure that its structure is appropriately adapted to the particular technology being used. The Tavistock workers have argued that the socio-psychological component equally requires integration into organizational structuring and in their formulation is implied a criticism of Woodward's seeming over-emphasis on technology. The view of technology as the single most important explanatory variable in organizational study certainly stems from Woodward's influence. "But the promise of technology as *the* explanatory variable seemed to be premature . . ." (Jackson and Morgan 1978, p.180), as the important studies by Pugh and his co-workers demonstrated.

5.2 THE IMPERATIVE QUESTIONED

The Aston Studies

The researches which have become known as the "Aston studies" were carried out during the 1960s by a group of investigators in the Industrial Administration Research Unit at the College of Advanced Technology in Birmingham (later to become the University of Aston), in which Derek Pugh was the Senior Research Fellow. These studies have become among the most influential in the field of organization theory.

In an early paper, the workers at the Research Unit looked at the literature concerning the study of work organizations and behaviour and concluded that, "There have been few attempts to relate organizational and group behaviour in a systematic way" (Pugh *et al.* 1963, p.290). They recognize that workers such as Argyris and McGregor have tried to take account of group processes and organizational demands, and the development of the socio-technical systems concept by Trist and his colleagues is seen as the most far-reaching effort in this direction. However, Pugh *et al.* point to two particular shortcomings of much of previous work. The first is that it has tended to be "processual" rather than "factorial". *Processes* of group interaction or administrative practice have been the main foci of discussion, rather than "systematic exploration of causal connections" between contextual factors and organizational phenomena. While admitting that both approaches are vital, they believe that "processual analysis must take place in relation to the contextual framework provided by factorial analysis, not in neglect of it" (*ibid.*, p.291). A further shortcoming mentioned is that the intensive one-case study has tended to dominate reserach, with the important

exception of Woodward's work, and they emphasize the need for broad comparative studies if generalizations concerning organizations are to be adequate.

When these workers outline their overall concern their implicit systems perspective is clear : "We are concerned with the attempt to generalize and develop the study of work organization and behaviour into a consideration of the interdependence of three conceptually distinct levels of analysis of behaviour in organizations : (1) organizational structure and functioning, (2) group composition and interaction, and (3) individual personality and behaviour. We are also concerned to interrelate each of these levels" (*ibid.*, p.292). Pugh *et al.* add that "the study of the structure and activities of an organization must be conducted in relation to its other characteristics and to the social and economic context in which it is found" (*ibid.*, p.293). And, in order to examine these relationships, they developed a series of "contextual variables", which are used as independent variables in order to establish their relationship to the dependent variables of organizational structure and functioning. The Aston studies have, in fact, to date (Pugh and Hickson 1976) been primarily concerned with this level of analysis : organizational structure and its relationship to contextual variables - one of which is technology.

"A major task of contemporary organization theory is the development of more sophisticated conceptual and methodological tools, particularly for dealing systematically with variations between organizations" (Pugh *et al.* 1968, p.43). These researchers were particularly concerned that the concepts they used were "operational", in other words, defined in such a way that it is clear what is required

to recognize and measure the concept in a particular situation. This means that a value on a scale can be assigned to the concept and subsequently used in a comparative factorial analysis. With this in mind, the group derived, from the literature and their own field-work experience, six primary dimensions of organizational structure : specialization of activities, standardization of procedures, formalization of documentation, centralization of authority, configuration of role structure and flexibility. It is postulated that the structure of any form of work organization can be portrayed on these primary dimensions and these can be used to compare different organizations. *Specialization* "is concerned with the division of labour within the organization, the distribution of official duties among a number of positions" (*ibid.*, p.48). The researchers measured the number of activities performed by specialists and the extent to which there was specialization of role within a specialist activity. *Standardization* of procedures is measured by a count of the number of such procedures available to an organization from a given list. A procedure "is taken to be an event that has regularity of occurrence and is legitimized by the organization" (*ibid.*, p.50), and has rules and definitions which purport to cover all circumstances and can be applied invariably. *Formalization* "denotes the extent to which rules, procedures, instructions and communications are written" (*ibid.*). A list of possible documents was drawn up and used to examine the different purposes for which documents were utilized. *Centralization* "has to do with the locus of authority to make decisions affecting the organization" (*ibid.*, p.51). The group looked at the level in the hierarchy where executive action could be finally authorised and also measured the degree of autonomy by examining the numbers of

decisions needing to be referred to a headquarters or parent organization. *Configuration* "is the 'shape' of the role structure" (*ibid.*, p.53), and would be reflected in a comprehensive and detailed organization chart. A number of aspects were measured to assess this dimension : they included vertical span of control as manifested by the number of positions between the chief executive and the production worker, the chief executive's span of control, the ratio of subordinates to first-line supervisors and the percentage of employees involved in direct output. *Traditionalism* reflects the degree to which procedures are standardized but unwritten. Procedures can either be based on customs, which can be seen as "implicitly legitimized verbally transmitted" procedures, or they can be in the form of documents outlining rules, instructions, and so on. This was measured by the difference between ten selected standardization items and ten corresponding formalization items.

Data was collected from 52 organizations in the Birmingham area which included a variety of factories, commercial offices, public utilities, transport undertakings, retail stores, etc., both publicly owned and private, and both independent units and units owned by larger groupings. Examples range from toy and vehicle manufacturers and food processors to some government department and service organizations, such as the public water department. The organizations all employed over 250 employees and 14 employed over 2000. The researchers were essentially attempting to establish the underlying dimensions of organizational structure. They found that many of the dimensions were highly related to each other. Using the statistical technique of factorial analysis, which allows the investigator to distinguish which scales go together

and are also independent of other scales, the original primary dimensions were combined into four basic dimensions : *structuring of activities* which is the "degree to which the intended behaviour of employees is overtly defined by task specialization, standard routines, and formal paper work" (Pugh *et al.* 1969, p.92), and this dimension encompasses standardization, formalization and vertical spans. *Concentration of authority* is the "degree to which authority for decisions rests in controlling units outside the organization and is centralized at the higher hierarchical levels within it" (*ibid.*), and this includes organizational autonomy, centralization, percentage of workflow supervisors and standardization of selection and advancement procedures. *Line control of workflow* refers to the "degree to which control is exercised by line personnel instead of through impersonal procedures" (*ibid.*); this dimension encompasses ratio of subordinates, formalization of job performance records, percentage of workflow supervisors and standardization of selection and advancement procedures. Finally, the *supportive component* is concerned with the relative size of supportive and auxiliary activities and encompasses percentage of clerks, vertical span and percentage of non-workflow personnel.

The Aston workers thus established four independent dimensions which could be used to compile the characteristics of particular organizations. And they now point out : "As a result of this dimensional analysis, it is clear that to talk in terms of the bureaucratic ideal type is not adequate, since the structure of an organization may vary along any of these four empirical dimensions" (Pugh *et al.* 1968, p.62). They further point out that if similar scales can now be developed for an organization's

context, then the relationship between structural and contextual dimensions can be examined using correlational and multivariate technique. For example, they mention that "both the variables of size and technology have been presented as *the* determining ones for structure, but the relative importance of these two factors has still to be demonstrated" (*ibid.*).

Pugh and his co-workers next examined the aspects of organizational context which were potentially relevant to organizational structure (Pugh *et al.* 1969). Factors are seen as "contextual" in the sense that "they can be regarded as a setting within which structure is developed" (*ibid.*, p.91). Using a similar approach as previously, the group identified seven primary concepts of organizational context : origin and history, ownership and control, size, charter, location, dependence on other organizations and technology. These were analyzed and operationally defined scales constructed which measured the degree of a particular characteristic - and these scales were then applied to the organizational data which had been gathered. Factor analytic techniques again allowed the condensation and reorganization of concepts; eight distinctive scales of elements emerged : age, size of organization, size of parent organization, charter (operating variability and diversity), workflow integration (technology), number of operating sites and dependence on other organizations, for example, suppliers, labour unions, and so on. And these were now used as independent variables in a prediction analysis of the previously defined structural variables. "The patterns of association revealed by correlational analysis, stripped to their essentials, pick out three main variables, an encouragingly simple result. They are : size, dependence, and, in a lesser and different

role, technology" (Pugh and Hickson 1976, p.10). The main relationships are *size* with structuring of activities, *dependence* with concentration of authority, *technology* with some configuration features. Pugh *et al.* now assert : "Thus the knowledge of a score of an organization on a small number of contextual variables makes it possible to predict within relatively close limits its structural profile" (Pugh *et al.* 1969, p.110), for example, "knowing the dependence of an organization on other organizations and its geographical dispersion over sites tells a great deal about the likely concentration of authority in its structure" (*ibid.*). The greater the dependence and the larger the number of operating sites, the greater the concentration of authority at some point is likely to be. In this case, number of operating sites has a similar but weaker relationship to concentration of authority.

The Aston researchers paid particular attention to the question : " How far does technology determine the form taken by the structure of an organization?" (Hickson *et al.* 1969, p.378). They point out that there has been extensive research at the group and individual level, looking at the connection between technology, the tasks performed by workers and their interpersonal interaction, satisfaction and attitudes. The seminal studies of Trist and Bamforth (1951) and Walker and Guest (1952) are mentioned, as are the contributions of Sayles (1958) and Blauner (1964). However, "Few have made technology at the level of the *organization* their focus" (*ibid.*), and in this regard Woodward's comparative research is a marked exception, although her study has been criticized for ill-defined concepts and inadequacies of data analysis. Thus Hickson *et al.* maintain that "the importance of technology to the structure of an organization continues as an open

issue" (*ibid.*, p.379). Woodward claimed that only differences in technology, and not in other variables such as size or historical background, were related to structural differences, and the Aston workers set out "to test this proposition of the 'technological imperative' at the organizational level of analysis" (*ibid.*).

They begin by suggesting a classification of technology into *operations technology*, *materials technology* and *knowledge technology*. *Operations technology* is used by Pugh *et al.* who define an organization's technology as "the techniques that it uses in the workflow activities" (1963, p.310). Hickson *et al.* define the concept of operations technology as "*the equipping and sequencing of activities in the workflow*" (*ibid.*, p.380), where workflow is taken to mean producing and distributing the output. *Materials technology* concerns the materials used in the workflow, such as its state of uniformity or stability. Finally, *knowledge technology* is a concept developed primarily by Perrow (1967), and refers to the characteristics of the knowledge used in the workflow. Perrow is concerned with "the number of exceptional cases encountered in the work" (p.195) and the degree of logical analysis sued. However, the Aston project used only the operations technology concept.

Hickson *et al.* began by identifying a number of sub-concepts. The first is that of the equipment used in terms of its *automation*, which is seen as its self-acting ability. Next is the *rigidity of the workflow sequencing*; this depends on the extent to which operations are linked and the extent the mechanics, knowledge, skills and raw materials can be used for other products. All work organizations also have some means of assessing the operations carried out, whether this relies on the application of

standards or merely on opinions. This gives a third "constitutive definition", in terms of *specificity of evaluation of operations*. And the fourth sub-concept is the *continuity of the units of throughput*, in other words, looking at whether the technology is single-unit jobbing, batch, mass-production or process-production, a scheme central to Woodward's approach, as has been seen. These concepts were again operationalized and a series of relevant measuring scales built up.

Analysis of the data from the 52 organizations in terms of these scales again showed high correlations and factorial analysis was implemented to combine the measures, this time into a single overall variable called *workflow integration*. This concept contained such elements as the degree to which the workflow was automated, capable of evaluation and adaptable to other purposes. Using the same structural variables described by Pugh *et al.* (1968), the relationship of operations technology to structure was tested by multivariate correlational techniques.

Technology (workflow integration) was now found to have *no* relationships of any consequence with the main structural variables. Generally, correlations with technology were overwhelmed by those of *size*. However, a few specific configuration variables were conspicuously correlated with workflow integration, and *not* with other contextual variables : subordinate-supervisor ratio, the percentage of total personnel who are workflow supervisors, or who are in design, methods or inspection functions. These are "simple job-count variables; none deal with the wider administrative or hierarchical structure" (Hickson *et al.* 1969, p.388). The researchers now feel confident to conclude : "*On this sample, the broad 'technological*

imperative' hypothesis that operations technology is of primary importance to structure, is not supported" (*ibid.*).

The researchers also looked at the 31 manufacturing organizations in isolation : "As in the full sample, it is size that is overwhelmingly related to structuring of activities" (*ibid.*). Concentration of authority was again closely associated with dependence rather than operations technology. And technology was not associated with line control. Their conclusion is again : "Workflow integration is not substantially correlated with any of the main structural variables listed, and where some positive association is indicated, it is again overwhelmed by the correlations with size" (*ibid.*). Again, some relationships with job-count variables remained.

The group next attempted to replicate Woodward's study. They used her original ten part classification but developed a scale of "production continuity" along which they could position their sample. Moderate relationships remained but were shown to be inconsequential when size was taken into account. Hickson *et al.* thus assert that, "in general, even the use of this different scale, approximating a classification devised specially for manufacturing organizations, fails to show widespread significant relationships with structure" (*ibid.*, p.391). The Aston results were thus clearly inconsistent with those of Woodward. However, the researchers do point to certain differences in data analysis and samples used which make comparison somewhat difficult. Some reconciliation between the two studies is also attempted. A significant feature of the studies is that in Woodward's study the size of organizations ranged down to 100 employees compared to the minimum number of 250 in the Aston programme. They

thus suggest that "*variables of operations technology will be related only to those structural variables that are centred on the workflow*. The smaller the organization, the wider the structural effects of technology; the larger the organization the more such effects are confined to particular variables, and size and dependence and similar factors make the greater overall impact" (*ibid.*, p.395). And they posit some speculative reasons : "In the smaller organizations, everyone is closer to the 'shop floor', and structural responses to the problems of size (for example) have not begun to show. In larger organizations, managers and administrators are buffered from the technology itself by the specialist departments, standard procedures, and formalized paperwork that size brings with it" (*ibid.*).

Hickson *et al.* finally conclude by saying that, "This interpretation breaks the stalemate between the classical management theorists and the behavioural scientists . ." (*ibid.*, pp.395-396). The management theorists, who tended to voice prescriptive "rules" without consideration of the influence of technology, may have some point if they are dealing with large organizations - and certainly some of these writers have been associated with bigger manufacturing organizations. And the behavioural scientist emphasizing the impact of technology may well be equally right : "technology makes all the difference at 'shop floor' level, and throughout smaller organizations, where nothing is far removed from the workflow itself" (*ibid.*, p.396).

The Aston work has proved to be enormously influential. Its attempt to operationalize many key organizational variables and apply a sophisticated and detailed statistical

analysis has, in itself, been a major contribution to the development of organizational study. The actual breadth of scope of the project was also a substantial advance on previous studies - a wide array of variables were carefully selected and relevant data collected in an extensive, comparative survey of 52 work organizations over a period of years. The Aston study attempted to make it feasible to estimate an organization's structural characteristics from a knowledge of its contextual features and, within the limits of their sample, have successfully demonstrated how this can be accomplished. In so doing, they have further firmly refuted the hypothesis of the "technological imperative". And, finally, the Aston studies have acted as a stimulus for further investigation into the role of technology in the organization.

Like most important studies, the Aston work has, of course, also drawn its share of criticism. Among the first to re-examine the Aston findings was Howard Aldrich (1972). Aldrich argues that the investigators "fail to realize the full implications of their conclusions" (p.31), and do not investigate all the plausible explanations of causal ordering in their results concerning technology, size and structure. Using the Aston statistics and a path analysis technique, he then tests several possible causal models and constructs a model of organizational development. His argument begins by asserting : "Dependence and technology were assumed to be primary causes of organizational structure" (*ibid.*, p.35). Technology is claimed to have "high causal priority" because "an organization's choice of its technology is deliberate and conscious, with other aspects of organizational design following logically from the particular technology chosen" (*ibid.*, pp.35-36).

Specifically, Aldrich postulates that, "Work flow integration has a direct causal impact on structuring of activities . ." (*ibid.*, p.38), as well as on concentration of authority. And size is seen as a function of work flow integration (technology), operating variability and structuring of activities. Overall, he concludes that the fact that technology again emerges as a major variable in his re-analysis demonstrates that "conclusions about the significance of specific variables depend on a theory of organizational structure and development" and he argues for "conscious theory building" (*ibid.*, p.40). Pugh and Hickson, in their reply to Aldrich, emphasize that their use of cross-sectional data was aimed at establishing relationships and possible predictions, and "this is all one can say on the basis of these cross-sectional data, and no form of analysis (including path analysis) could use these data as *evidence* for causal theories" (1972, p.275). They claim it is possible only to say that Aldrich's proposed developmental sequence "seems likely in some instances" (*ibid.*), although they add that the same can be said for the suggestion that size causes structure, which Aldrich implies is implausible.

Aldrich's criticisms raise important issues. Although the Aston researchers make it clear all along that their studies "cannot provide direct evidence to support or refute any causal hypothesis" (Pugh and Hickson 1976), studies which do explore causality are highly necessary if one is to reach a comprehensive understanding of organizational functioning. Studies of processes over time (longitudinal studies) are thus needed, because cross-sectional data which are all collected simultaneously cannot allow one to infer that a change in one variable definitely causes a change in another. A first small attempt at longitudinal comparisons using Aston measures was carried out by Inkson

et al. (1970). Contextual and structural features of fourteen organizations were compared at two stages with an intervening period of four to five years. They were led to suggest that over this type of time span a "ratchet mechanism" operates between size and structuring of activities, that is, increase in size leads to increased structuring, but a decrease in size would not decrease structuring. It is quite clear that this type of conclusion could not be established in a purely cross-sectional study - more extensive study designs are needed which incorporate dynamic data, allowing processes stemming from change in particular variables to be charted.

Replication of research remains an important part of the process of theory building as was pointed out in Chapter Two, but, as Pugh and Hinings (1976) mention, in a direct sense this very rarely happens in the social sciences. However, the Aston studies were followed by a series of replications, some more extensive than others. The study of Inkson *et al.* (1970) previously mentioned, besides studying 14 organizations with an intervening time period, also looked at 40 organizations in the English Midlands - they replicated limited aspects of the Aston studies using special abbreviated measures. And their findings confirmed those of the original Aston programme. Hinings and Lee (1971) also carried out a small replication study in a sample of Coventry manufacturing organizations. Their sample contained little or no variation in technology but did vary in size and dependence, and the effects of these latter two dimensions could thus be examined. With only minor discrepancies, their findings were also in accord with those of Pugh *et al.* (1968, 1969). A further major replication of the Aston work was carried out by

Child and Mansfield (1972), who investigated the relationship between technology, size and organization structure. Their study became known as the "National" study.

The National Study

Child and Mansfield began by explicitly stating that their theoretical framework is that of an open socio-technical system. The data they set out to collect is again of a cross-sectional nature which, as has been mentioned, cannot be used to examine causal models. However, Child and Mansfield maintain that cross-sectional data can, nevertheless, be usefully utilized within a socio-technical system theoretical framework. Firstly, they point out that a systems model is characterized by the existence of feedback loops, a characteristic which rules out any simple uni-directional model of causality such as that implied by path analysis. They also argue for viewing an organization as being in at least an approximate steady state, because the rate of change of variables studied is typically relatively slow, unless conditions prevail which would be evident to an investigator. This view implies that the system may, in fact, be represented by a series of simultaneous equations relating the various system parameters and the inputs from and outputs to the environment. Child and Mansfield now explain the purpose of their study as being "to attempt to elucidate the relationships between the system parameters of organization structure, technology, and size as a first step in the process of elaborating the full set of equations defining organizations as open socio-technical systems" (1972, p.371). And "cross-sectional correlational analysis is likely to provide good but nonetheless approximate indicators of the relationships between the parameters of

organizations in steady states; and as such will be of assistance in the articulation of a coherent theory of the structure and functioning of work organizations" (*ibid.*, p.372).

Child and Mansfield are, however, aware of some of the dangers of utilizing a systems model - they make it clear that they are not implying any reification of the organizations themselves. In using the open socio-technical system model, they say that they are "merely referring to two major sets of parameters of organizations (social, technical variables), to interaction between intra- and extra-organizational variables, and to the likely 'systemic' nature of relationships between variables", and they add : "We are conscious of the fact that all such relationships are a product of human decision and action" (*ibid.*, p.391). Despite this consciousness, Child and Mansfield choose to confine their study only to the "establishing the order of relationships between system parameters" (*ibid.*), and the meaning and intent underlying the association is not pursued, although they recognize that this level of enquiry is also essential.

These researchers now emphasize that the scope of this study is "largely confined to a replication and further exploration in which the Aston ground rules and procedures regarding the measurement of technology and organization structure have been faithfully adhered to", and they hope to provide substantial additional data for discussion of technology's role in organizations.

The sample they used was of exclusively work organizations and was different in some respects to the Aston sample :

the organizations were located in all the main industrial areas of Britain and Scotland (hence the name of the "National" study); most of the organizations were not branches or sub-units; the organizations were all business oriented; they were confined to six industries and, finally, the size of organizations was generally smaller (a mean size level of 1542 as compared to 3370 in the Aston studies). The industries examined included electronics and pharmaceuticals, sweets and chocolates (manufacturing); advertising and insurance (service) and daily newspapers.

Within these industries, 83 organizations were studied, data being collected from late 1967 to the end of 1969. Workflow integration was again found to be moderately related to components of specialization and standardization. "The strength and direction of the correlations are very similar in both the Aston and National studies" (*ibid.*, p.377). However, the relationship of size to the structural variables was found to be much stronger. Using Woodward's scale, the investigators found considerably different results to the Aston workers, but feel that this is probably due to differences in the sample. One other contrast with the Aston work was in the National sub-sample of manufacturing organizations : technology measures enjoyed a moderate positive relationship with the chief executive's span of control, a finding closer to that of Woodward. Overall, they conclude that their results "strongly support Hickson *et al.*'s finding (1969) that size has a much closer relationship to the aspects of structure measured than does technology" (*ibid.*, p.383).

Generally, except for some configuration variables, the National study also provided some support for Hickson

et al.'s suggestion that the relationship between technology and structure would be greatest in small organizations. Technology was most strongly associated with supportive activities that are closely tied to the workflow - again in agreement with Aston. Child and Mansfield did, however, also find that individual sub-scales of workflow integration related differently to structure : some related to a particular dimension of structure but not to others.

The National and Aston studies thus definitely tend to confirm each other, although there are exceptions. Child and Mansfield feel confident to say : "The results of both the Aston and National studies taken together would appear totally to refute any argument that technology is the single major correlate of organization structure" (*ibid.*, p.388), although it must be remembered that the same measures of organizational properties were used. In fact, these two studies stand as among the most extensive and rigorous examinations of the order of relationships between an organization's structure and contextual variables. And their major influence has been firmly based on this comprehensiveness and empirical thoroughness.

Chapters Four and Five focussed on important contributions from writers who have had as a central concern in their various analyses the implications of technology within an organizational setting. They share a recognition that technology is a variable of potential significance in organizational analysis, some arguing for this significance more than others. However, the recognition of technology as a variable with potentially far-reaching and fundamental consequences for organizations and their human participants is a recognition which was markedly rare among the other schools of writers examined. And this recognition has

certainly been a stimulus for investigators - investigators who have attempted to incorporate technology in various ways and from various viewpoints into their diverse schemes of organizational analysis. As was demonstrated in the earlier sections of Chapter Four, many of the writers have approached technology at the level of its relevance to the individual worker (for example, Blauner (1964)) or to the work group (for example, Sayles (1958)). Their interest has been centred on technology's influence on the worker, some writers examining attitudes, others being more interested in behaviour patterns. But their focus has largely remained on the worker-technology nexus and its ramifications. The work of the Tavistock researchers then attempted to incorporate organizational analysis within a more comprehensive scheme and organizations were viewed from the perspective of a socio-technical system. This perspective stresses interrelationships between organizational components, a process of commerce with the environment and adaptation to environmental constraints. A criticism which has often been directed at organizational theorists has been their lack of analytical attention to the influence of extra-plant factors and the systems model certainly allows a researcher to include this influence in his explanatory formulations. However, as has been mentioned, the socio-technical systems writers were inclined to view environmental demands in mainly economic terms. Writers such as Trist *et al.* (1963) and Rice (1958) stressed the need to give primacy to neither technological nor socio-psychological considerations, but that only by a "balancing" of both could the full potential of an enterprise be achieved. The systems scheme certainly represents a framework which appears to hold perhaps the most promise for elucidating how an organization actually functions and how its components relate to each other and

to the environment. And it is certainly because of this great explanatory promise that the systems view has prevailed in organizational studies to the extent that it has. However, the socio-technical system writers used their model largely in intensive case study situations and it was left to other writers to progress beyond this particular empirical format.

Joan Woodward also undertook her landmark study in the 1950s - a study which incorporated a wide comparative analysis of a group of organizations. Woodward's work "marked a major step forward in the way it provided an analytic framework for the organization level study of technology" (Child and Mansfield 1972, p.375). Woodward's approach, appropriate only within manufacturing organizations, involved a classification of the dominant method and style of production and she found that organizational patterns differed in correspondence to her classification. Woodward consequently argued for the "technological imperative" - technology is the *major* variable in dictating organizational structure. And her propositions were largely supported by some replications. However, the subsequent work by the Aston group profoundly questioned these propositions.

The Aston researches have been elaborated at some length because, in many ways, they represent among the most sophisticated and ambitious analyses of organizations - and their influence on organization theory has been immense. It was thus thought worthwhile to note some of the details of their formulations of structural and contextual concepts which were operationalized in their study. They demonstrated very clearly the incisive use of a systems perspective in an extensive comparative analysis

of organizations - and that this could elucidate important interrelationships and could yield predictors of organizational structure from knowledge of contextual variables. Their examination relied on factor analytical statistical techniques - an outstanding example of the use of this approach in organization study. The Aston work has also had the further reinforcement of being supported by replications, especially the wide-ranging National study. Overall, the fundamental conclusion was that the "technological imperative" hypothesis was not supported; technology was relegated to a secondary role and was no longer seen as a major influence on organizational structuring.

In the study of organization the belief that the technology employed can have an explanatory role has thus been persistent and important. However, when confronted with the question : does technology directly dictate an organization's structure and processes?, a "prudent response would have to be a qualified 'no'" (Jackson and Morgan 1978, p.195). The organization level studies have shown technology to be associated with some aspects of organization structure, especially configurational factors. But, overall, in the light of the recent research considered, the effect of technology does certainly not seem to be pervasive. "There is little support for treating technology as an *imperative*; it does not seem to *dictate* structure" (*ibid.*). Research does, however, point to a more profound technological influence on activities which are centred on the workflow itself, as one would expect. Certain *theoretical* studies have asserted technology's importance, however, for example that of Perrow (1967) who states : "technology, or the work done in organizations, is considered the defining characteristic of organizations" (p.195). Perrow elaborated a distinction between routine

and non-routine technologies, classifying technologies with regard to the frequency with which exceptional cases are encountered and with reference to the nature of the search process (for solutions) that ensues when exceptions or problems occur. However, little direct evidence for the validity of this kind of model is available. Jackson and Morgan thus personally believe that "the importance of technology is more theoretical than empirical" (1978, p.197).

Comparisons between major studies remain problematical. Disagreement exists between definitions of technology and between measures of technology. Furthermore, diversity of sample is a further complicating factor which can be difficult to account for. The employing of several technologies by a firm can be an additional problem. Merely placing a firm's technology on some continuum in terms of an apparently dominant technology may neglect the importance of the other forms. This was a point made by Child and Mansfield (1972) when discussing the Aston measures - it is not always obvious which technology is dominant. They further pointed to the fact that separate dimensions of their technology measure related to structure differently; in other words, technology may have several dimensions, a factor which requires consideration. Because of these and other possible problems, Jackson and Morgan caution against merely dismissing technology as an important structural variable. Further investigation is certainly required.

However, perhaps the major limitation of research designed to establish statistically the presence of associations between organizational characteristics is pointed to by John Child (1972) when he mentions that these studies

"usually leave underlying processes to be inferred" (p.1). He maintains that models of this nature "offer an interpretation of organizational structure as a product of primarily economic constraints which contextual variables are assumed to impose" and he argues that "available models in fact attempt to explain organization *at one remove* by ignoring the essentially political process, whereby power-holders within organizations decide upon courses of strategic action" (*ibid.*). And, indeed, as has been pointed to previously, it is inherent in a systems perspective to draw attention away from purposive human action and to imply that organizational behaviour can be understood by reference to the functional imperative of "system needs". The proposed antidote Child presents is based on the argument that there is, in fact, some freedom of manoeuvre with respect to contextual factors, standards of performance andstructural design, and consequently "some choice is implied as to how the organization as an on-going system will be maintained" (*ibid.*, p.14). Child also refers to the "dominant coalition", drawing attention to who is making the choices. It can be seen that this view is actually very reminiscent of the concept of "organizational choice" introduced by Trist *et al.* (1963). Child now argues for a revised theoretical perspective, focussing on the exercise of strategic choice by the dominant coalition; the exercise of this choice begins with an evaluation of an organization's position and then moves into the area of making actual choices of goals, markets and so on. In addition, it involves an attempt "within the limits of availabilities and indivisibilities, to establish a configuration of manpower, technology, and structural arrangements which is both internally consistent and consistent with the scale and nature of operations planned. The 'goodness of fit' that is in the event achieved is

seen to determine the level of efficiency secured which is expressed by output in relation to cost" (*ibid.*, p.17).

Child's proposed theoretical revision is a laudable attempt to counter the tendency of system's theory to de-emphasize human action and the degree of choice involved in organizational settings. However, Child's emphasis is mainly on his "dominant coalition", which is defined as "those who collectively happen to hold power over a particular period of time" (*ibid.*, p.13), as opposed to those who are in a position of response to the wielding of this power. While his suggestions represent a step closer, they still fall short of examining the *underlying basis* of the choices made. In passing he mentions that "prior ideology" in some measure colours evaluations, and this ideology is seen as, at least partially, being derived from outside the organization. It was other theorists whose propositions were directed at remedying this neglect - they sought to incorporate more fully the notion of "*socially generated and distributed* aims, attitudes and actions" (Rose 1975, p.227, my italics) into organizational analysis and explanations of behaviour, not restricting their scope only to dominant power-holders. This approach, which has become known as the "Action" approach, is thought by some to represent a cogent alternative to the predominant systems model which at present prevails in organization theory. This perspective will be looked at in Chapter Six.

CHAPTER SIX

THE ACTION APPROACH

Use of a systems perspective in organizational study has as its necessary central focus the organization as a functioning whole. Within this perspective attention is also directed to system components and their interrelationships, but this attention seeks to explicate the roles of the component sub-systems in contributing to overall *system* survival and adaptation. And, as has been seen, an organization can adapt to its environment in various ways and at various rates, within certain limits. A direct implication of this systems approach is that the human participants, as part of the organizational system, are an integral part of these system processes and, as such, their behaviour may be viewed as a reflection of organizational structure and needs. However, as has previously been pointed to, the limitations of this view begin to become apparent when one asks questions such as : *why* does the organization, in fact, adapt in different ways and at different rates? An answer could be that one of the system components is the human participants with their predispositions, predispositions which can allow members to resist taking what would be, from the system's viewpoint, an effective course of action. These predispositions are seen as a further input from the environment and derived from a particular cultural system. However, Silverman (1970) now points out that : "It may also be argued . . . that the environment, *as perceived by the observer*, never exerts this sort of influence on the patterns of interaction within organizations" (p.37). The

source of any member's actions and decisions is, in fact, *his own definitions* of the situation, and not the observer's. The actual organizational factors are only meaningful in the sense that meanings are attached to them by those involved. From this assertion one can explain organizations' differential adaptations to the environment. And the "Action" approach now argues that organizations can be seen as "the outcome of motivated people attempting to resolve their own problems" and that the environment in which an organization is located can be regarded "as a source of meanings through which members define their actions and make sense of the actions of others" (*ibid.*, p.126). Organizations are now seen principally as the collective outcome of purposive human action - a dramatic shift of emphasis from the systems perspective in which an organization is represented as something practically independent of man.

In examining the action approach, the definitive work by David Silverman, *The Theory of Organizations*, will be largely followed as his is perhaps the most clear and comprehensive statement of this perspecitve in organizational studies. Comments of his have also been included at various points in this text with the action approach in mind. Many writers have made use of the action approach, mainly in the fields of sociology and psychology, and Silverman attempts to draw together their views into an "ideal-typical action theory".

6.1 The Action Frame of Reference

As has been seen, among the writers concerned with technological implications were those who viewed the worker as merely responding to his physical and technical environment (for example, Sayles). Taylorism, human

relations and most of the organizational psychologists relied on some concept of universal human needs as being the mediating variable between the objective features of the work-place and the individual. Taylor relied on economic motivations, the human relationists concentrated on social needs and the organizational psychologists saw needs in terms of some sort of universal hierarchy, each need requiring satisfaction in turn. The interaction between the community and the work-place receives little investigation as a potential source of explanation. Silverman states his objective as being "to draw out the implications for study and for theory-building of a view of social reality as socially constructed, socially sustained and socially changed" (*ibid.*, p.5). The emphasis of the action approach lies in understanding the *actions* of organizational members rather than merely observing behaviour. And this action arises from the *meanings* which the actors assign to situations.

People are now seen to *act* in terms of their own interpretation of a situation and of the actions of others. For example, a particular supervisor's behaviour may be seen differently by different workers : some may desire supervision of this nature whereas others may see it as a way of winning their sympathy in order to accomplish some objective to which they are opposed. Action is, therefore, no longer seen as simply a response to some stimulus, but as a product of a "system of expectations", to use Parsons' term, which arise from an actor's past experiences. This action is also goal-oriented and the actor will thus choose from among the available alternatives the route which most likely will lead to his subjectively perceived ends.

Silverman's proposed model of man finds its *source* of meanings in society. In answer to the question : where do meanings arise? Silverman suggests : "One valid answer would be that meanings are given to men by their society and the past societies that precede it" (*ibid.*, p.130). Participation in a society leads to certain norms and expectations becoming internalized by the societal members - and these norms and expectations are only *sustained* by continual reaffirmation. One's view of appropriate behaviour in certain situations is usually confirmed by the everyday acts of others which seem to stem from the same assumptions. However, if it is true that meanings are socially sustained, it follows that they can be socially *changed* by the interaction of men, for example, through some disruptive event casting doubt on a particular expectation.

From this view of man it follows that explanation of human action must emphasize the meanings which *those concerned* assign to their acts. One must, in other words, put oneself in the other's place and attempt to understand his interpretation of the events or the situation. In this way one can come closer to explaining *why* certain actions are carried out. The action approach also argues for seeing explanations in terms of some "*ideal-typical*" actor. "It is not necessary to reduce human acts to a more or less well known individual actor. To understand them it is sufficient to find typical motives of typical actors which explain the act as a typical one arising out of a typical situation" (Schutz 1964, Vol. II, p.13, as quoted in *ibid.*, p.139). This type of approach demonstrates one advantage over a systems perspective. As has been mentioned, a systems viewpoint is inclined to be concerned with analysis from the viewpoint of the leaders of an

enterprise. In contrast, the action approach emphasizes that different ideal-typical actors can exist within organizational strata with different ends and systems of interpretation. In fact, a situation can now be examined in terms of "competing systems of interpretation", and an investigator will now be closer to explaining how problems of management arose, why they continue and what can change them.

A further dimension of an action perspective points to the use of a natural science model in the study of social life - it is held that social and natural phenomena constitute entirely different orders of subject matter. This is precisely because social life has this "internal logic" which needs to be understood by the investigator. Any investigator must come to grips with the subjective meanings the actors themselves attach to their acts. This does not, however, affect the "common rules of procedure" derived from the natural sciences, in other words, comprehensive data collection, rigour of analysis, and so on, but there remains the additional dimension to be taken into account in social analysis. Furthermore, the positivist view is rejected : constructs such as system needs or system dynamics or other system constraints do not have causative roles; action, in fact, depends primarily on the *meanings* actors attach to their actions.

6.2 Action Analysis

Silverman emphasizes that the action approach is not, in itself, a theory of organizations, but "is instead best understood as a method of analysing social relations within organizations" (*ibid.*, p.147), and he draws out certain implications for an action analysis of organizations.

He states : "The first task of organizational analysis is . . . to distinguish the orientations (finite provinces of meanings) of different members (ideal-typical actors)" (*ibid.*, p.150). Writers such as Blauner and Sayles have linked certain observable aspects of organizations, for example technology, to work behaviour, implying that presence or absence of certain features will determine behaviour. This approach relies on the rarely explicit psychological assumption of some universal personality needs, as has been pointed out, which in turn implies that particular technical systems will have certain affects on all workers. However, as Silverman notes, work by, among others, Goldthorpe and Cunnison has shown that knowledge of these objective characteristics is not an adequate predictor of behaviour. Members of an organization are sometimes found to react differently to what appears *to the observer* to be the same stimulus. An example of a possible expansion of this basis of explanation has been suggested with regard to satisfaction with particular rewards : satisfaction is not determined by rewards alone "but by the extent to which they diverge from what is desired" (*ibid.*, p.149). This means that *expectations* now become of major importance in the explanatory scheme. Thus it becomes clear that orientations and their meanings, so often ignored, must be investigated. As a guide to this investigation, Silverman points out why orientations differ : they derive from members' various backgrounds (for example, a rural background or previous conditions of unemployment), and from "the multiple statuses which they hold at a time" (*ibid.*, p.150) (for example, husband in a family, membership of a voluntary association or religious group). In addition, different experiences *within* the organization can encourage or discourage certain ends and expectations and generate others. This process can, in

fact, lead to a change in an actor's orientations as he re-defines his actions according to the consequences of his action and interactions in the organization. Change at the organizational level can also be understood within the action frame of reference. Where an organization is within a changing environment and some adaptation, for example a technical innovation, is incorporated, this adaptation is not mechanical, the organization "itself" does not act to maximize efficiency. Limits are, of course, set by the environment, as has been noted by Burns and Stalker, Emery and Trist and others, but any change is governed by the interpretations of the environment which the organizational members have and their consequent decisions. A similar point was made by Child with his introduction of the concept of "strategic choice", but Silverman insists that the main explanatory emphasis must be placed on "the impact of the stock of knowledge in the outside world" (*ibid.*, p.151). Silverman has thus clearly identified the areas of analysis which, within an action approach, hold the most explanatory promise and has also clearly pointed the way for investigators to explore the use of this frame of reference in organizational studies.

6.3 Action Studies

One important industrial monograph which demonstrates the use of a frame of reference, emphasizing the explanatory potential of workers' orientations derived from the community, is *The Affluent Worker : Industrial Attitudes and Behaviour*. This monograph was a by-product of the larger Luton studies. The studies set out to assess whether the British working-classes were in a process of *embourgeoisement*, in other words, whether prosperous manual workers were being incorporated into middle-class

society. Workers from various types of industry were sampled to examine the extent of this process, because "technological implications theory indicated that some settings might better facilitate *embourgeoisement*" (Rose 1975, p.234). Rose mentions, for example, that process-production industires, which had been portrayed as not conducive to alienation, were thought to perhaps be situations where the workers could possibly assimilate the values of technologists and managers with whom they had frequent contact. The Luton workers also turned their attention to an automobile assembly plant. And here they encountered a surprising situation : despite the fact that workers describe their tasks as one might expect, that is, boring, fragmentary, machine-paced, and so on, this apparently did not lead to any marked dissatisfaction with their *jobs* as a whole. Rose mentions that, "Neither frustration of some hypothetical inner need for self-actualization nor production pressures provoked any general desire to seek other work or any deep, brooding hostility towards management" (*ibid.*, p.235). In fact, "assemblers expressed broad satisfaction with their jobs as a whole" (*ibid.*). In support of this subjective appraisal, absenteeism and labour turnover were low and industrial conflict was practically non-existent. What could explain this situation? : the workers were in a job which involved considerable deprivation, of which they were aware, yet they appeared to be largely satisfied with their lot. When asked what kept them at the plant, most replied "the money", and it might have been tempting to regard these workers in a Taylorian light as being economically motivated. "Goldthorpe and his associates, rather, suggest that the assemblers' economicsm is one aspect of a broader instrumental orientation towards work which is linked with a privatized community existence" (*ibid.*, p.236). Their

"instrumental-privatized" orientation was confirmed by evidence which pointed to the workers' lack of desire for "solidaristic attachments" at work and to their preference to be left alone by foremen. Both the management and the union appeared to be seen in mainly calculative terms. One solution suggested was to assume that this calculative quality extended to their entry into the work-place, in other words, they had *self-selected* themselves into this kind of work. This would imply that a group of like-minded individuals could end up in a particular type of work situation. Goldthorpe, however, concluded that the workers' orientations would have to be seen as an "important independent variable relative to the in-plant situation" (in *ibid.*, p.237) if one wanted to explain these attitudes. "In other words, if we want to understand what goes on inside factories we must look outside them" (*ibid.*). The Luton workers very tentatively distinguished factors apparently associated with the workers' heightened instrumentality : family position; the character of the community; social mobility which tended to be downward; and level of skill. Rose links these factors together : "Crudely stated, an argument which arranges these factors logically might run as follows. Young married men of lower skill who have experienced downward social mobility relative to their kin have higher than average financial commitments and feel a need to compensate for their loss of standing with relations. This requires that they carry out unpleasant but highly paid work for long hours and restrict their non-work activities to the family circle. This instrumentalism at work and privatization outside it may be reinforced (or at least, not diluted) by the character of the community - in the case of Luton a 'town of migrants' in which persons of their own type predominate" (*ibid.*, p.238). The Luton researchers made

it clear that this explanation was largely conjectural and merely consistent with their available data. However, whether their assessment is completely correct or not is less important than the fact that the environment as a source of orientation was recognized as having potential in making sense of industrial data. Certain criticisms can be levelled at their work in terms of Silverman's formulation of the action approach. It may be true that the worker orientations in this particular case were formed and modified mainly by out-plant factors, but one can not say that this applies to all workers. As Silverman has noted, changes in orientation can also arise from in-plant work experiences.

A further study which used an action frame of reference was Gouldner's "Wildcat Strike". Silverman points out that Gouldner chose an analysis which sought "to explain the actors' changing interpretations of the situation" (Silverman 1970, p.155). A strike situation at a gypsum mine was looked at in terms of a "theory of group tensions". This approach emphasizes role-expectations and the extent that tension arises when there is a discrepancy in the role-expectations of two parties. And group tensions can be seen as the result of certain forms of social situation.

6.4 The Action Contribution

Silverman, in summing up the contribution of the action perspective, maintains that it has relevance to both the "micro" and "macro" levels of organization analysis. At the micro-level, "it is particularly well fitted to explain the orientations and behaviour of members of occupational groups (e.g. miners, nurses, clerks), or of the more narrowly

defined role-players in particular organizations (e.g. a 'successor')". Action is no longer explained merely as a mechanistic reaction to actors' positions in an organization or as a reflection of system processes, but is shown to derive from the actors' own aims and their own definitions of organizational situations "as shaped by their prior expectations (associated with their extra-organizational statuses) and their historical experiences of past interaction" (*ibid.*, p.164). From a wider point of view, this also contributes to an understanding of the relationship between "work and non-work", a contribution which assists in developing an understanding of "the nature and consequences of social stratification" (*ibid.*). Focus is on the actor in his occupational role but seeking explanations in his out-plant biography must lead to some more complete conception of the extra-plant societal forces.

At the "macro" level, an action perspective emphasizes that, while various groups or individuals may pursue organizational ends such as "efficiency", the sort of organizational structure which occurs is seen to be "the outcome of the relative capacity of different actors to impose their definition of the situation upon others . . ." (*ibid.*, p.165). This is as opposed to an organization's structure merely being a result of system adaptation to demands in the environment. The managers are generally those with the power to impose their definitions, and the action approach stresses that a particular structure is a consequence of the use of this power to make decisions and see them implemented.

The action approach also allows questions to be raised concerning the extent to which a particular pattern of interaction implies shared values. Some shared expectations must be presumed, if a pattern is maintained, but people

may have different reasons for maintaining the interaction. Knowing that there can be a potential lack of consensus, despite the absence of overt conflict, allows some prediction of the degree of stability of an interaction pattern. And this can be elucidated by examining an actor's orientation and the meanings he attaches to them.

The final point mentioned by Silverman is the ability of the action approach to "explain how changes arise from the interaction of the actors" - he sees this as the approach's chief merit.

Silverman also looks at the question of comparative study of organizations and suggests that an action perspective can again be usefully applied. He points out, quite correctly, that any comparative study begins with the investigator's explicit or implicit preference for particular aspects or relationships on which he intends to concentrate. This is well illustrated in the Aston studies - the researchers made it very clear that they were interested in establishing relationships between structural variables and the organizational context. This is certainly a different emphasis to the one Silverman suggests would result as a consequence of the action approach. The typology used in the comparative study would now be directed at an analysis of the motivated action of actors and the resultant interaction patterns. More specifically, he maintains that comparative study will now be concerned with the "nature of the predominant meaning-structure and associated role-system in different organizations and the extent to which it relies on varying degrees of coercion and consent" (*ibid.*, p.172). Patterns of involvement, strategies used by actors and the "relative ability of different actors to impose their definition of

the situation upon others" (*ibid.*), will also receive scrutiny.

In attempting some initial evaluation of an action frame of reference in organizational studies, a comment of Rose's (1975) can be used as a starting point : "Excessive stress on actor orientation, or on subjective definitions of a situation, may suppress considerations of the underlying objective properties of the situation in which action occurs" (p.243). There is little doubt that objective features, such as the technology employed, operate as important constraints in organizational situations, although their influence can certainly be over-emphasized. Stressing the importance of subjective definitions may act as something of a counter to this potential over-emphasis, but neglect of objective features could allow analysis to become little more than a series of stories or anecdotes without any explanatory framework.

Rose also sees Silverman's conception of power as being, in some aspects, "bizarre". As has been mentioned, Silverman emphasizes power as being a means of imposing one's definition of a situation on others. But Rose claims that this view of power is roundabout and potentially misleading. He maintains that a "power-holder does not need to modify a subordinate's perception to have his way" (*ibid.*, p.247). He quotes the example that managers of underpaid workers who strike often argue that they cannot afford higher wages, and may threaten to dismiss workers unless they terminate the strike. "Any resumption of work usually depends more upon such threats than upon any acceptance of the manager's expectation of insolvency" (*ibid.*, p.248). Management can use their power simply to impose their will, rather than their definition of the situation.

One might also point out that, although Silverman sees the society as a source of the meanings workers bring with them into the work-place, he does not back up this perception with any particular model of the society as a socio-economic entity. Seeing a worker's orientations as being a reflection of the extra-plant, societal situation is one matter, but to place this within an explicit model of the society certainly would lead to a more complete analytical framework.

6.5 Action and Systems

Silverman's proposed use of an action frame of reference can certainly be seen as offering potential solutions to many of the problems inherent in use of a systems perspective in organizational analysis. To begin with, the danger of reifying the organization, in other words, implying that the organization is itself capable of thought and action, is avoided. Instead of seeing the organization as striving for the attainment of system goals and satisfaction of system needs, emphasis is now firmly centred on human action. Organizations act to attain goals and satisfy needs only insofar as the human participants act to satisfy *their* needs and attain *their* goals. One might criticize the action perspective for over-emphasizing rationality in human action, but the emphasis on purposive action remains a valuable reminder that organizations do not act independently. Furthermore, as has been pointed out, there are distinct difficulties if analysis is concerned with the level of organizational ends or goals. Silverman believes that one need not avoid the question of goals, "but by attempting to establish the ends which individuals and groups do actually pursue we can proceed to relate these ends to the different

social situations which arise" (1968, p.232). Silverman continues that this approach has the further advantage of freeing the analyst from "the implicitly consensual" framework of a systems perspective which characterizes conflicts as minor maladjustments in system functioning. The action approach now allows one "to examine the extent of conflict that may exist between different ends and the role of power in determining its consequences" (*ibid.*). Power remains a crucial variable because, as has been mentioned, the power-holders can compel others to act in accordance with their ends. It is thus evident that an action approach can incorporate an analysis of the sources of conflict and the role of power in organizational functioning, an analytical capability which is limited in a systems model.

As was pointed out by Elliott, the organizational problems which a systems perspective raises, such as those of "instability" or "disequilibrium", tend to be answered in management's terms. However, an analytical scheme based on an action frame of reference directs attention at the ends held by *different* groups and the relationship that these ends bear to social situations within and outside the organization. This approach encourages the organization to be seen in the light of the diverse strata and their particular orientations, rather than primarily from a management viewpoint.

In placing emphasis on purposive human action and the strategies actors use to gain their ends, Silverman has also shifted away from a concern with questions of *how* to a concern with questions of *why*. A systems model tends to stress *how* an organization functions and adapts to its environment. Silverman now attempts to *explain*

organizational functioning and adaptation by pointing to human action and further to the meanings actors attach to their strategies within the organization. Questions within the organizational analysis can now be referred to these areas in search of comprehensive answers.

In sum then, it can be seen that Silverman is offering a frame of reference which, in many ways, overcomes the shortcomings of the use of a systems perspective in organizational study. Silverman believes that a student of organization interested in placing his work in a "broad theoretical context" is faced with a choice : "he can make use of a revised and logically more satisfactory Systems approach or he can look around for the elements of an alternative theoretical scheme" (Silverman 1970, p.4). And Silverman argues that the time is right for presentation of a clear-cut alternative - and he proposes the action approach as this alternative.

CHAPTER SEVEN

CONCLUSION

"The study of organizations has come to occupy a central place in the social sciences in the past few decades - so much so that there are now distinctive disciplines centred around such study" (Dunkerley 1972, p.1). And, indeed, the growing importance of the study of organizations is hardly surprising when one considers the vital role played by organizations in a modern, industrialized society. In addition, the emergence of complex industrial organizations producing complex products and employing highly sophisticated technologies has placed an ever-increasing demand on the capabilities of managers and administrators - it has become vital that directing, controlling and co-ordinating of the large labour forces and extensive financial and material resources of organizations be based on sound, comprehensive knowledge. In part, it is certainly this consideration which has produced a burgeoning interest in the study of organizations. But the study of organizations has certainly come into its own as an academic discipline as well - study is now centred on problems chosen primarily for their explanatory potential and not merely in terms of management-oriented requirements. And it can certainly be argued that to some extent concern only with the areas which are of interest to the leaders of an enterprise can hinder the development of a comprehensive and "scientific" theory of organizations.

Pugh (1966) has pointed out that, in fact, "organization theory" is emerging as an interdisciplinary, quasi-independent

area of study. Organizations are now regarded as objects of study in their own right - the use of the term "study" emphasizes that this is a theoretical research-oriented activity. Management problems may provide interesting pointers and often useful insights in the development of hypotheses, but "these have to be tested out in systematically designed investigations if we are to carry forward the scientific process of developing new theories to cover the known facts and discovering new facts to upset the known theories" (Pugh 1968, p.346). Pugh carries on to point out that science is essentially a theoretical venture and he mentions Lewin's dictum : "There is nothing so practical as a good theory". A theory can be seen as "a statement in general terms about the likely relationship between two or more phenomena" (Silverman 1970, p.169), and a theory of organizations should be able to explain why organizations are as they are and should examine what causes them to change - explanations of both organizational structure and dynamics should be offered.

The importance of the phenomenon of organization began to be recognized more widely early in the twentieth century, and in the ensuing decades has drawn the attention of diverse scholars and practitioners who have, from various viewpoints and with differing emphases, attempted to explain aspects of organizational activity and to construct theories of organization relevant to their interest spheres. It is in this work that the parentage of modern organization theory is to be found and an understanding of their endeavours provides an essential backdrop against which to see the major issues confronting organization theory. This thesis has attempted to examine the landmark studies, emphasizing the major areas of interest, the distinct approach, the choice of problems and the underlying assumptions of the

investigators. In addition, some comments have been made on methodological issues drawing attention to empirical evidence (or lack of it) and to the specific methodologies used. Perhaps what is important in the development of organization theory is not so much what each school includes in its analytical schemes, but what it leaves out. It is argued that a distinct "pattern" is discernible in the movement away from highly specific areas of emphasis and the consideration of purely in-plant phenomena to formulations which become progressively more comprehensive, culminating in the reconceptualization of organizations as *systems*. Going hand in hand with this development is the movement away from universalistic and highly prescriptive formulations to a realization that there can be no one best way of organizing an enterprise - organizational structures must be adapted to the particular organizational and environmental constraints.

Within this "pattern", a further major emphasis of this thesis is on the position of *technology* within organizations. "Science and technology have become a pervasive force in modern society, influencing all of man's activities and providing a new shape to the world. In modern industrial society large-scale, complex organizations have become the primary means for utilizing technology" (Kast and Rosenzweig 1970, p.168). Technology and its role in industrial organizations remains an area of vital understanding for managers, administrators and students of organization alike. The major question remains : just how important is an organization's technology? This thesis has looked at some attempts to answer this question from various points of view and with various areas of focus. Writers concerned with technology have also demonstrated among the most sophisticated uses of a systems perspective in organizational analysis

with the development of the "socio-technical" systems concept. This basic framework has further been used in major studies in the 1960s reflecting the use of ambitious comparative analytical schemes and factor analytical statistical techniques in organization study. Studies of technology have, in fact, played an integral role in the reconceptualization of organizations as systems and in further underlining that there is no universally applicable organization design.

In the remainder of this concluding chapter, it is proposed to draw together and clarify some of the major points in this thesis and make some comments concerning the implications for current organization theory.

In reviewing the historical and theoretical development of organization theory, the principal stages of development were identified as (1) classical theory, (2) scientific management, (3) human factor industrial psychology, (4) human relations, and (5) organizational psychology (or "neo-human relations"). The writers who were concerned with the implications of technology were working at much the same time as the organizational psychologists, but focussed on technology as a potential explanatory variable. To begin with, the classical theory of bureaucracy was formulated by Weber. He intended his formulation to represent an ideal-type, a rational model of administrative organization. Weber thus intended his model to be *prescriptive* - he knew that reality deviated from this model but believed that efficiency would be higher the closer reality approximated to this model. However, Weber's model was particularly deficient in that it neglected the informal aspect of organizations and the real attitudes and behaviour of organizational members. The classical

management theorists share much of Weber's orientation : They meant their work to be prescriptive. Furthermore, classical management theory was not based on systematic empirical research - it was developed as a body of organizational *principles and maxims* to be used as a guide to running an organization efficiently. Scientific management shared this concern for efficiency : Taylor saw use of his new job designs as a means to better use of men and machinery, but his model of man remained a crude one - man was seen as *homo oeconomicus* who, given a monetary incentive, can be engineered like an instrument. The model of organization held by the classical writers and Taylor was basically static. "The organization appeared as a calculated, rational instrument, the goals fixed and stable, its formal structure the translation of this goal into means activities, and its integration based on hierarchical authority" (Mayntz 1965, p.96). Organizational adaption and interaction with the environment were seen as non-problematical.

Human factor psychology extended the conception of man into that of a more complex being, but their model saw man as simply *responding* to organizational stimuli. Their emphasis was limited largely to an examination of features such as fatigue and boredom. Perhaps their greatest contribution, however, was their insistence on scientific rigour in the study of man in organizations. In contrast, the enormously influential Hawthorne studies have been shown to have severe methodological shortcomings. Despite these, however, they led to the "discovery" of the informal organization. Subsequent human relations studies have generally characterized man as being primarily motivated by the need for interaction and identification with a social group in the work-place, a characterization which took little

account of monetary incentives or of the role of formal organization structure. *Work groups* thus became the central focus of study. Criticism has also been levelled at much of the human relationist work for its preoccupation with the improvement of management skills and its lack of attention to questions of intra-plant power differentials and extra-organizational factors.

The organizational psychologists again take the individual and the work group in organizations as their starting point. The human participants in organizations are now assumed to have a more complicated set of needs, but these needs are assumed to be *universal*. And the organizational psychologist "adjures the manager to create an environment in which individuals can fulfil themselves in jobs rich with challenge, and can participate in decisions that are going to affect them" (Lupton 1971, p.100). These writers were often writing openly for a management audience and Lupton characterizes their approach as "psychological universalism" because "it rests on the notion that the principles and procedures involved apply to all individual-organization relationships, regardless of the characteristics of the particular organizations" (*ibid.*, p.98). Styles of management must now be appropriate for high organizational performance and participant satisfaction. Organizational strueture is also seen as an area of potential re-design to meet these requirements - a considerable advance on the more limited prescriptions of the human relationists. Schein and Bennis do also introduce a systems perspective as a background to their work, but it is other writers who have perhaps explored this analytical concept more thoroughly.

The writers who focussed on *technology* now stressed that an

organization's technology places particular demands on that organization and its members. Writers such as Sayles, Blauner and Walker and Guest examined the effect of technology on worker attitudes and behaviour. It became clear that different technological environments had distinctly different implications for how workers felt about their work and for their behaviour patterns. The focus of these writers stayed at the worker-technology nexus, a limited perspective which generally failed to incorporate extra-plant factors into the analysis. Technology was either seen as directly *determining* a worker's behaviour or acting through the social milieu of the work-group. The Tavistock workers, under the influence of von Bertalanffy and General Systems Theory, developed an ambitious theoretical scheme, reconceptualizing organizations as *"socio-technical" systems*. Organizations are now defined as purposefully goal-oriented systems consisting of interdependent sub-systems. The system is in a dynamic relationship of input-transformation-output with the environment and in this process achieves a steady state, that is, a dynamic equilibrium. Furthermore, the system tends to be self-maintaining, adapting to environmental demands to ensure its survival. Analytical stress is now placed on the interrelationship between system components and between a system and its environment. In the Tavistock variant of a systems model the two major system components were seen as the technological and socio-psychological which are closely interlinked, These researchers emphasized that for an organization to function efficiently these two components needed to be "balanced". The Tavistock workers undertook extensive studies primarily of a case-study type and, further, developed the concept of "organizational choice" : an organization is constrained by its technology but there is a certain amount of choice of

structure available to achieve the matching of the technological and socio-psychological components. Burns and Stalker and others also looked at an organization's relationship to particular environmental conditions and demonstrated that an organization's structure further required to be adapted to environmental demands. It is now quite clear that an organization is fundamentally *constrained* by technological and environmental factors, which must be taken into account in designing structures. No universalistic management style will be sufficient to ensure organizational functioning unless structure is successfully adapted to these constraints.

Woodward, in her landmark study, using an implicit systems approach, reinforced this point by identifying technology as the *major factor* influencing an organization's structural configuration. Woodward also found that successful organizations using a particular form of technology tended to have similar structural characteristics, suggesting further that for success an organization needed to be adapted to the technological constraints. Woodward's study was also remarkable for its introduction of a wide comparative scheme of analysis.

Woodward's work was in many ways continued and extended by the highly influential Aston and National studies in the 1960s. The Aston studies demonstrated the use of factor analytical statistical techniques in a wide comparative study of organizations. Aston represents one of the most sophisticated attempts at actually constructing scales to measure organizational characteristics - including technology. These studies established the order of relationships between structural and contextual variables, enabling characteristics of an organization's structure to be predicted from knowledge

of its contextual variables. Aston also demonstrated the efficacy of replication studies, several of which have reinforced the Aston findings. Overall, technology was shown to no longer be an "imperative" in organizational study, but was relegated to a secondary role, a finding in direct contrast to that of Woodward. As a point of reconciliation, it was suggested that the effect of technology is more acutely felt in smaller organizations.

The Aston studies were directed at a particular level of analysis : that of the *organization*, as opposed to the group, or the individual. And they represent one of the most far-reaching applications of a systems perspective focussing on organizational interrelationships at the level of structure. However, the reactions to this study introduce some of the fundamental problems of a systems perspective.

Before considering these, some further comments concerning the use of a systems model in organizational analysis can be added. Mayntz (1965) maintains that : "The application of a system concept and system theory to the field of organizations proved of absolutely decisive importance" (p.100). Many of the shortcomings of past theoretical schemes now appeared to be remedied. This framework can take account of formal and informal structures, in-plant and extra-plant factors, and stresses the interlinking of system parts. This reconceptualization was, in many ways, a reaction to the inadequate classical conception of organization - "a static, prescriptive model of formal structure considered as a means-end scheme oriented to one fixed and stable purpose" (*ibid.*, p.101). Mayntz emphasizes that the human relations school had "merely added knowledge about informal groups and relations, and the

importance of attitudinal factors, but had not achieved a reconceptualization of organizations as a whole" (*ibid.*, p.100). The organizational psychologists expanded the area of emphasis as did those workers who recognized technology as a constraining factor, but it was left to the systems model to place the organizational components in a dynamic formulation, a formulation which appears to be able to overcome many of the problems of these previous theoretical schools. Emphasis is no longer lodged in one particular area, but in the interrelationship of all system components; and the influence of extra-plant factors, so often ignored, is part of the analytical scheme. In addition, the systems scheme claims to avoid any inherent managerial bias - it claims to be impartial, being purely descriptive and analytical.

However, as has been pointed out at various points in this thesis, despite the widespread acceptance of the systems perspective and its obvious advantages as an analytical tool, it has several distinct shortcomings. The relevant features of this debate can be introduced by pointing to Child's recent comments on the implications of Aston-type studies (1972). Child maintains that, although studies of this nature are designed to establish statistically the presence of associations between organizational characteristics, "these models proceed to the simplest theoretical solution which is that the contextual factors *determine* structural variables because of certain, primarily economic, constraints the former are assumed to impose" (1972, p.2). And Child argues that this simple theory is inadequate - "primarily because it fails to give due attention to the *agency of choice* by whoever has the power to direct the organization" (*ibid.*, all my italics). Indeed, this

underlies the tendency of a systems approach in general to direct attention away from purposive human action. Child continues to argue that there is freedom to manoeuvre with respect to contextual factors, standards of performance and structural design and he suggests that theoretical developments should *centre* upon the "strategic choice" exercised by an organization's "dominant coalition".

Silverman's action approach extends this suggestion by essentially agreeing that analysis should centre on human action, but also on the *meanings* that *actors* attach to their actions. He believes that only in examining the strategies used and underlying ends of "ideal-typical" actors as well as the consequent interaction patterns, can organizational activity be fully understood. Analysis now *begins* with motivated action rather than with system needs - beginning with system needs has the consequence of seeing behaviour merely as a reflection of these needs. Silverman has, in fact, demonstrated that the action approach can counter many of the problems of a systems perspective, as was pointed out in Chapter Six. For example, it has been shown that even a systems model usually implies a management bias, a bias which is certainly not perpetuated if analysis concentrates on the *ends* of groupings within an organization. For the same reason, the action perspective can also certainly deal with organizational conflict in a more convincing way. However, the essential decision seems to be whether one ought to begin with the ends of the system, as perceived by the observer, or with the ends of the participants. Silverman maintains that, "Although both are related, it is important to note that this is not merely a 'chicken and the egg' controversy" (1968, p.232). Certainly beginning with an organization's system goals brings with it considerable

problems of definition, as has been pointed out in this thesis. Implying that a system has independent goals is also to imply that the system is capable of independent thought and action. On the other hand, to concentrate on ends as seen by particular individuals or groupings is perhaps to obscure the influence of objectively perceivable organizational constraints. There is certainly a body of evidence, for example, the work of Woodward and Burns and Stalker, which indicates clearly that an organization, if it is to survive, must be adapted in certain ways to the demands of the technological system and the environment. It cannot be denied that these constraints are only made meaningful by their translation into organizational reality through human action, but will taking human action as an analytical *starting point* elucidate the influence of organizational constraints?

There is also what one might call a meta-theoretical level to this debate, a debate which writers such as Weeks see as central to organization study. Weeks argues that the "major problem is to account for the dialectical quality in social life in a scientific manner, given that scientific explanation and prediction are our aim. This involves coping with the observation that man is both a result of his social/organizational environment as well as a participating creator of that social/organizational environment. There is thus a constant tension between our view of man as constrained by social influences . . . and our view of man as an autonomous being capable of superceding such man-made restrictions and creating new situations and bases for social organization" (1973, p.378). Weeks goes on to point out that, if one looks at particular theories, there is usually a degree of emphasis towards one side of the picture or the other. And, importantly

research methods will also tend to vary accordingly. The debate thus revolves very much around a System v. Action distinction. Weeks points out that these two perspectives start from very different assumptions and have very different aims. "The systems approach views the whole, locating individual action according to its place within the whole, whilst the action approach begins with the social act and attempts to construct more general propositions by a process of accumulation" (*ibid.*, p.381). A systems approach tends to encompass a more deductive approach to organizational analysis. It begins with a general theoretical framework and the task of research is seen "as filling out empirically the empty categories in the largely preconceived conceptual plan" (*ibid.*, p.386). Weeks admits that it can be argued that all scientific theories employ a deductive approach; however, he maintains that theories do vary "in the initial degree of openness or closedness they display" (*ibid.*). By openness he means "the attempt to derive analytic categories from the available data rather than simply collecting data in terms of an *a priori* categorization" (*ibid.*). In this sense, although there are some initial presuppositions in terms of choosing an area of study, the action approach has its theoretical ideas "grounded, to a much greater extent, in the empirical phenomena under study. The discovery process is a cumulative one building up the theoretical structure piece by piece" (*ibid.*).

Clearly then, these are two very different approaches to organizational analysis - and they also imply very different research methodologies. A systems approach implies an analysis which concentrates on the interrelationships believed to hold between elements of a system or structure. An example would be the relationship between structural and

contextual variables or even the relationship between system goals and environmental factors. This approach also implies the use of comparative data in order to arrive at a theory applicable to a wide-range of organizations. The common problems faced by organizations are held to be more significant than individual problems of specific organizations. The Aston studies clearly reflect this methodological inclination. In contrast, the action approach necessarily implies a different research perspective. The area of concern is now human action and its meanings to those involved. Silverman admits the difficulty of measuring meanings, but believes it is possible. Techniques such as the use of questionnaires or interview schedules can be used, but must "be constructed in such a way that the structure of everyday life experience and conduct is reflected in them" (Cicourcel 1964 quoted in Silverman 1970, p.227). In other words, as Silverman points out, "they must be concerned with problems which are meaningful to the respondents and must use questions which are framed in terms which reflect their (but not necessarily the observer's) everyday meanings" (1970, p.227). Participant-observation and, to a more limited extent, laboratory studies are two further potential research methods which can be used with this theoretical perspective. However, as yet the full methodological implications of use of an action approach in organization study have not emerged.

It appears then that there are two very distinct approaches to a study of organizations, emphasizing substantially different orders of phenomena and implying substantially different research methodologies. Certainly no easy reconciliation presents itself to an organizational investigator - as Rose points out : "Ideally study of

society" - and one can add, of organizations - "should integrate system and action perspectives. However, the magnitude of this task is discouraging" (1975, p.228). What then can be said about the implications of this for organization study? Silverman maintains that an action approach does *not* deny that organizational members may find features of the social structure *constraining*; his emphasis is that the *experience* of these constraints in only in terms of the meanings the members attach to these constraints. Perhaps this comment points the way to the possible respective potentials of the system and action approaches. The relationships established between structure and organizational characteristics by Woodward, Pugh and others, and the relationships between structure and environmental features pointed to by Burns and Stalker and others, indicate clearly that for organizations to function "successfully", subject to certain constraints and demands, certain structural adaptations should come into existence. These relationships certainly represent an important part of the total picture of a functioning organization, a part of the picture which an action-oriented analysis would obscure. The Aston workers in their early conceptual writings (Pugh *et al.* 1963) point out that their eventual aim is to integrate the three levels of analysis : organizational, group and individual. While being intimately interrelated each of these levels constitutes a definite point of focus. The author of this thesis would argue that, in the latter two areas, an action approach holds the most explanatory promise to provide the other parts of the organizational picture. Social action and interaction certainly constitutes an area of study with distinctive features.

Despite the belief expressed by writers such as Dunkerley

(1972) that one Grand Theory of organizations is possible, the day when such a theory will be comprehensively formulated appears to still be far off. Nevertheless, every study of organizations adds something to the growing body of knowledge which attempts to explain the structure and functioning of organizations, and the behaviour of groups and individuals within them - if only to point the way to future research. However, this research, some of which will eventually be translated into organizational practice, can only fulfil its potential if researchers enter upon their task aware of the work of their predecessors, aware of the bias of their own predispositions, and aware that the theoretical starting point they choose has consequences for both the answers they will find and the methods they will use to find them. In the light of this, it is hoped that future leaders of organizations, be they part of management or not, will be able to base their activities on a body of knowledge with a somewhat less precarious foundation than that relied upon by preceding generations.

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