THE SOCIAL PSYCHOLOGY OF ORGANIZATIONS

DANIEL KATZ
Department of Psychology
and Survey Research Center
The University of Michigan

ROBERT L. KAHN
Survey Research Center
and Department of Psychology
The University of Michigan

SECOND EDITION

JOHN WILEY & SONS

New York • Chichester • Brisbane • Toronto • Singapore

1 POINT OF DEPARTURE

OUTLINE

The psychological approach to the study of problems in the social world has been impeded by an inability to deal with the facts of social structure and social organization. Societies in their very nature represent organized groupings of people whose activities are institutionally channeled. The exercise of power and control in a society is largely a function of its institutional structure. Yet the dominant tradition in psychology has included the implicit assumption that individuals exist in a social vacuum. Students of personality have recognized the importance of familial patterns of behavior for the development of character, but they have neglected the fact that people behave not only as grown-up children but as adult members of social systems. Social psychologists, too, have been guilty of negligence of the facts of social life. Their partial attempts to include social variables reflect a curious alternation between the most global of all influences, that of culture, and the most minute of group influences.

The great central area of human behavior in organizations and institutions has been ignored. Yet in the modern world people spend the greater part of their waking hours in organizations and institutional settings. The usual textbook in social psychology consists of three parts—a consideration of individual cognitive processes (that are of possible social significance) such as attitude change, cognitive dissonance, and causal attribution; an account of personality development and socialization; and a treatment of interpersonal and intragroup processes.

This type of book, in our opinion, leaves off where the most important problems of social psychology begin. A second volume is necessary to move beyond the introduction to the field and to deal with the psychological aspects of social structures. The present work is an attempt to supply such a second book in social psychology.

Psychologists halt their study with the individual in the small-group setting in great measure because they lack conceptual tools for venturing into more complex areas. Although the need for dealing with structure and organized forms has been acknowledged in all scientific disciplines, there have been basic weaknesses in most of the theoretical approaches popular in social psychology. Behaviorism, psychoanalytic theory, and field theory have been too individual in orientation and hence of very limited usefulness in dealing with social-structural problems. Nor have the older societal theories of the other social sciences provided the answers.

OPEN SYSTEM THEORY

Through the application of open system theory, we are beginning to move toward a social psychology concerned with social structure.

This approach emphasizes two aspects of social behavior patterns: (1) their *system character*, so that movement in one part leads in predictable fashion to movement in other parts, and (2) their *openness to environmental inputs*, so that they are continually in a state of flux.

Open system theory emphasizes the close relationship between a structure and its supporting environment. It begins with the concept of entropy, the assumption that without continued inputs any system soon runs down. One critical basis for identifying and understanding social systems is therefore their relationship with the energic sources for their maintenance. For almost all social structures, the most important maintenance source is human effort and motivation. If we wish to understand the maintenance of social systems, we are at the social-psychological level. The carriers of the system cannot be ignored; they furnish the sustaining inputs.

The other major emphasis in open system theory is on throughput: the processing of production inputs to yield some outcome that is then used by an outside group or system. Thus the hospital meets the health needs of the community, and the industrial enterprise turns out goods or furnishes services. In any given system, these functions can be identified by observing the cycle of input, throughput, and output. That cycle is sometimes described in terms that abstract it from the human beings involved—so many tons of raw materials and so many finished products. The moment, however, that we deal with the throughput cycle in ways that include the organization of people in the system, we are again at the social-psychological level. Thus open system theory furnishes a useful framework for examining social structures from a social-psychological point of view, and social psychology informs the open system approach to human organizations.

The continuing transactional relationships with the environment point up the contingent character of social systems. From an open system point of view the constancy of environmental inputs cannot be assumed but must continually be the subject of investigation. Thus the nature of the environment—its stability, turbulence, and degree of organization, for example—becomes a critical area of study. The behavior of an organization is contingent upon the social field of forces in which it occurs and must be understood in terms of the organization's interaction with that environmental field.

Another aspect of open system theory is its inclusion of different levels of systems and their interrelationships. A pattern of collective behavior with a limited specific function may tie into other patterns to achieve a more general outcome, as in the case of work groups whose cooperative relationship insures a final product. These interconnected groups may form the technical or production subsystem of an organization. In addition, however, these behavior patterns are crisscrossed by

cycles of behavior from the managerial subsystem. There is a hierarchical ordering of the many parts of the organizational structure such that actions at higher levels are dominant over actions at lower levels. Most transactions with the environment are monitored through the managerial system, so the external relationships of an organization's officers comprise a critical set of variables for predicting the effectiveness and survival of the organization itself. Individuals in strategic positions are therefore not excluded from scrutiny, but they are studied as people in specified roles subject to the social milieu of those roles.

Because of the hierarchical relationship of system levels and the functional relationships of system parts, the optimal strategy in social discovery is to look upward in the system. In natural science we look down for explanation, expecting that physiology will account for psychological processes, and biochemistry for physiological processes. In social science, however, our first search should be at the more complex system level. For example, a certain small automobile company has had a record of industrial harmony and few strikes. We could go down to the individual level to find out if the leaders on both sides tend to be nonaggressive people; we might even try to examine their socialization history in terms of early weaning and toilet training. But if we go to the next higher systemic level, we discover that the company is marginal in the industry, that it cannot afford a costly strike, and that both labor and management have agreed to follow the compromises reached between the larger producers and the United Auto Workers.

FORERUNNERS OF OPEN SYSTEM THEORY

The roots of open system theory go deep, and the lines of historical development are not clear. Four past conceptualizations, however, have paved the way for present interest in the system view of organizations:—(1) Marxian theory, (2) Parsons and the structural-functionalists, (3) Allportian event-structure theory, and (4) the general systems approach.

Marxian Theory

Perhaps the most systematic as well as challenging attempt to deal with social structure and its social-psychological aspects is Marxian theory. Because of its confusion with propagandistic doctrine, the theory itself has sometimes received summary treatment from social scientists. In some senses it was an effort at a field theory of society in which social relationships rather than individual characteristics were the determining forces and in which structural dynamics were expressed as the dialectic. It was more a theory of the internal dynamics of social structures than of the mutual influencing of system and environment, as in open system theory. Marx saw the social relations of production as the key institutional system of a society leading to its class stratification, its conflicts, both internal and external, and their resolution. The primary motivating factor was not so much individual self-interest as the role the individual played in the production process and the group interest of people playing similar roles. Behavior in common roles came first; then ideology developed as a weapon to handle common role interests. In other words, social stratification preceded class consciousness. Other subsystems of a society, such as the school, the church, and the state, were built around the social relations of production.

The strength of the Marxian theory was its breadth and depth. It took account of societal organization, specified its apparent critical institutions, and yet related its structural analysis to the carriers, or human beings, of the system and their interactions. It proposed that the major determinant of ideas and values was not economic status as such but key economic roles, the way in which men and women related to their fellows in the productive process through selling their labor or some other commodity or buying the labor of others. The workers who no longer owned their tools in a large factory system and who were exploited in the sale of their labor power were alienated from the dominant values of the society. Marxian theory asserted that social interaction among workers in urban factory centers would facilitate the development of ideology. It further claimed that overt behavioral conflict was necessary to crystallize group ideology. Hence demonstrations, strikes, and confrontation would facilitate such ideological development. Thus Marxian theory made assumptions about social interaction, social reinforcement, the playing of behavioral roles, alienation, and the conditions producing group solidarity.

The weakness of Marxian theory for social science purposes is twofold. First, it was tied too specifically to certain conditions Marx had observed at one period in history and in certain localities. Marx did not generalize his notion about the significance of role settings in determining behavior, but narrowed it down to the role relationship he considered primary—the social relations of production in privately-owned uncontrolled industry, and the resulting class conflict. Second, Marxian thinking concentrated too much on internal dynamics; social change was seen as the working out of built-in contradictions. The changing environment and its potential for affecting institutions received insufficient attention. The capacity of a system to use its environment to handle its internal conflicts was recognized, but only as a delaying, temporary expedient. Open system theory, on the other hand, would attempt long-range predictions about social structures only in terms that included environmental factors. In an uncertain and con-

stantly changing environment, such predictions take the form of contingent statements.

Talcott Parsons and the Structural Functionalists

Like the Marxians, the structural functionalists, headed by Talcott Parsons (1960), have examined social structures from the point of view of the functions they serve. The Parsonians also resemble Marxians in that they seek the function of a system not so much in the limited operations of its subsystems as in its impact on the whole society. But unlike the Marxians, they do not make social dysfunction a central concern. Instead they see our society as integrated by a common set of values and they are interested in how the parts of the system contribute to these values and are affected by them. Marx focused on social change. His theory was formulated to account for radical transformations, especially the predicted transformation from capitalism to socialism. Parsons' interest is more in social stability and the adjustments made within the societal supersystem to keep it functional and to preserve that stability. For that reason Parsonian theory has been criticized as establishment-oriented and unable to deal with change.

In examining the operation of social structures, however, Parsons has contributed conceptual tools for delineating subsystems and their specific functions. The interrelationship of these subsystems and the nature of the "break" as we move from one subsystem of an organization to another have thus become areas of study. It is only a step from this analysis to the notion of boundary systems and boundary roles. Although Parsons' writings do not provide the operational procedures for dealing with environmental transactions, they do move us away from the older sociological theories of a closed system character.

Allportian Event-Structure Theory

F. H. Allport (1954, 1962, 1967) is one of the few psychological theorists to deal with problems of social structure at their own level. He believes that patterned human activity cannot be adequately described in biological metaphors. Social groupings have no separate anatomical structures that parallel their functions as the parts of the body parallel the functions of the organism. Nor does the physical arrangement of buildings describe the structure of the social organization. Yet there is something out there that can be identified objectively. It is the form of human interaction, the shape of the patterned behavior. Allport conceptualizes social structure as a cycle of events which return in circular fashion to reinstate the cycle. This pattern occurs in the real world and not just in the head of the social scientist. Events are the observable nodal points in such cycles, and can be conceptualized as structures.

Instead of linear behavior of A stimulating B and B responding, Allport believes that a continuing series of events must complete a cycle before we have social structure. Moreover, cycles can crisscross or can be tangential to one another, and they can vary in size. These complex patterns need to be identified if one is to understand social behavior.

Allport's earlier thinking along these lines contributed the concepts of partial inclusion, potency of involvement, and structural relevance. Partial inclusion, which to date has been the most useful, refers to the fact that organizational membership and role behavior generally include only a piece of personality. Organizations are thus composed not of people but of common behavioral segments. Potency of involvement refers to the strength of an individual's attachment to a collective structure, which is measured in terms of the effort that person would put forth to maintain the structure if it were threatened. Relevance is the extent to which attitudes and actions affect the structure in question.

The implications of the Allportian approach for the study of social organizations are threefold. First, it calls attention to the fact that social systems as forms of behavior involving people have no anatomical structure. The function itself is the structure. Thus social systems are more contrived than biological systems and have no dependable life cycle. Their parts can be indefinitely replaced as long as human beings exist. It follows that open system theory, if it is to be fruitful for social research, must avoid the fallacy of biological analogies.

Second, the development of open system theory requires the identification of patterns of social behavior by following cycles of events as individuals complete their circles of repetitive interactions. In this search we should look for the activity that can reinforce or modify the original pattern. Observations of this sort establish future possibilities, not past accomplishments.

Third, Allport's work implies that the usual causal approach of seeking the impact of single variables in a complex field should be replaced by examining the ongoing structure of interacting events. Factor A may have a dramatic effect on factor B in the laboratory, but in the real world, if factor B is part of a field of forces, A may have little or no influence. The introduction of a planned change in an organization may have unanticipated consequences or none at all, depending on the nature of the ongoing system processes.

Allport's point of view is well summarized in his own words:

> Causation, in the structural view, is not historical, nor linear, but continuous, time independent and reciprocally cyclical. One looks for it neither in society nor in the individual, as traditionally seen as separate levels or agencies, but in the com-

pounded patterns of structuring which are the essential reality underlying both. (1962, p. 19)

General Systems Theory

Several decades ago von Bertalanffy (1950, 1956) proposed the idea of a general system theory that would embrace all levels of science from the study of a single cell to the study of a society. It would seek generalizations that would hold at all levels so that the methodological unity of science would be accompanied by a substantive unity of principles and laws. General system theorists might not deny conceptualizations specific to a given level but would emphasize the fundamental similarities across levels and the possibility of a unified science. They therefore reject the traditional barriers between the various academic disciplines. Miller (1955, 1965a, 1965b) and his colleagues further developed the general systems approach to show that a single set of concepts could be applied across different sciences. Methods of handling information overload, boundary crossing, subsystem coding, feedback, the transactions of input, throughput, and output are proposed as characteristics of all "living systems."

As formulated by von Bertalanffy, the general systems approach postulates the openness of every system; general system theory should be open system theory. It is easier in practice, however, to take account of stable relationships than dynamic interactions of input, throughput, and output, and many approaches labeled systemic are in fact closed and static. Systems engineering, for example, constructed models of man-machine arrangements that made simplistic and unchanging assumptions about human beings. Much of the systems engineering approach has embodied the fallacies of Taylor's scientific management and is not properly open system theory.

Another difficulty with the general systems approach is its preoccupation with biochemical and biological levels of phenomena and explanation. This is true of the original formulation, as well as of the work of the Miller group. Boulding (1956) has described a hierarchy of systems representing eight levels of complexity:

1. frameworks of static structure
2. the clockworks of physics and astronomy
3. the control mechanism or cybernetic system
4. the cell or self-maintaining structure
5. the genetic or plant level
6. the animal level with purposive behavior and self-awareness
7. the human level
8. social organization or individuals in roles

He believes, moreover, that the phenomena to be explained become more complex at each successive level and that adequate theoretical models have been developed only for the first four. Even if this evaluation is pessimistic, it does indicate why the natural sciences have dominated the thinking of students of systems. The danger, however, is that analogical thinking will replace concepts derived from the direct study of the higher levels of phenomena.

GROWTH OF THE FIELD OF ORGANIZATIONAL STUDIES

Organizational research has had major inputs from five sources: (1) the case studies of sociologists, (2) traditional industrial psychology inspired by scientific management theory, (3) the Mayo exploration into small group processess and related work in group dynamics, (4) comparative studies of social organization, and (5) surveys of morale and motivation.

Sociological Case Studies

Organizational behavior as a field of study owes much to the early case studies of sociologists who took an almost anthropological approach in their emphasis on depth of understanding of a single social unit. In a series of studies, many of which appeared in the decade of the fifties, industrial sociology came into its own and provided rich materials for the formulation of organizational hypotheses. Among the better known of these early case studies are Selznick's account (1949) of the Tennesee Valley Authority, Gouldner's investigation (1954) of a coal mine, Stanton and Schwartz's study (1954) of a hospital psychiatric ward, Blau's comparison (1955) of two government agencies, Lipset's collaborative work with Trow and Coleman (1956) in describing a labor union, and Sykes' graphic account (1958) of a prison. Although no longer popular, the tradition of the organizational case study has persisted in the insightful work of a number of investigators such as Stotland and Kobler's depiction (1965) of the life and death of a mental hospital. And Brown (1960) has followed up the work of Jaques (1951) with a continuation of the change story in a British metal works.

Although strong in qualitative observation and penetrating in their insights into social processes, these case reports were weak in quantification and so provided little opportunity for establishing relationships between variables. Case studies need not exclude measurement, but the early trend was for comprehensive qualitative coverage and little quantification.

Scientific Management and Traditional Industrial Psychology

Industrial psychology began with a narrow focus; it accepted organizational variables as givens and tried to learn how people could

best be selected and adapted for the required organizational roles. The orientation was pragmatic, and the organization was viewed as a machine. The dominating interest, explicit or implicit, was how the organization could be made more efficient. The scientific management school of Frederick Taylor (1923) conducted time and motion studies, investigations of temperature and illumination, rest intervals, and other conditions of work—always in relation to the criterion of productivity. This concern with ways of increasing productivity went hand in hand with personnel procedures for developing an appropriate fit between a particular role and its incumbent, preferably without modifying the role. In short, industrial psychology before World War II contributed some knowledge about the behavior of individuals in work organizations but little about the behavior of organizations. It was more a branch of applied individual psychology and, in fact, had many of the same founders as other branches of applied psychology. It did not include system variables, told us almost nothing about the nature of organizations, and was silent about problems of organizational change.

Mayo and the Rediscovery of Informal Group Processes

Whereas early industrial psychologists took the formal organizational chart as an account of organizational structure, sociologists and social psychologists were interested in the interpersonal processes and emerging group norms of organizations as ongoing systems. The experiments of Elton Mayo and his followers (1933), originally designed to investigate problems of scientific management (optimum conditions of illumination), ended up by dramatizing the importance of the small informal group. Even under poor working conditions female employees in a group enjoying special status and special privileges improved their productivity, whereas male employees with their own established norms about productivity were relatively unaffected by such treatment (Roethlisberger and Dickson, 1939). The increased productivity, known as the Hawthorne effect, has been ascribed merely to giving more attention to workers—an interpretation that misses the central part played by participation and group norms (Kahn, 1975).

The Mayo tradition was paralleled by the group dynamics movement, which had a different theoretical heritage—the work of Kurt Lewin (1947). Lewin and his associates developed research and theory on group process much more systematically than the Mayo school. Both approaches went beyond the industrial psychology of the time in seeing people in organizations not merely as individuals responding to the formal requirements of their roles, but as group members developing their own norms and their own cohesion. Although this was a great advance, it still did not deal with individuals as organization members.

The small group was as far as many disciples of group dynamics were willing to go. In England, however, the Tavistock research group, also influenced by Lewin, pursued a rather different line of investigation and opened the door to a consideration of system variables. They conceived of the organization as a sociotechnical system dependent on the character of the social environment (Trist et al., 1963).

Comparative Analysis of Organizations

Sociologists have supplemented their case studies of organizations with comparative analyses in which they seek to find relationships among characteristics of organizations themselves, or between organizational characteristics and aspects of the environment. By studying two or more organizations at a time, the investigator attempts to make generalizations at the organizational level—for example, between size and differentiation, or between an uncertain environment and flexible organizational structure, or between rate of growth and the proportion of employees in administration and in production. The organization, not the individual, is the unit of analysis.

Such studies clearly focus on the system and furnish a valuable counterpoint to the older industrial psychology. Their weaknesses have been less conceptual than methododological, in that their measures of organizational variables have often come only from secondary sources, such as organizational records, or from expert opinion. Too often the investigator lacks the resources to assess adequately the factors under investigation. Nor do researchers agree either about what should be studied or how, even if resources were ample. Nevertheless, the approach of the comparative study must engage the organizational researcher of the future, because comparative analysis is especially appropriate for furnishing information about the primary adaptation of the organization to its social and technological setting (Udy, 1965). Already in 1965 Udy, in his review of the work in this area, was able to report on over 100 studies, an encouraging sign. It should be added that the survey method can also contribute to the comparative analysis of organizations, provided that more than one organization is involved in the research design and the surveys are directed at organizational variables. The work of Tannenbaum (1974) illustrates the use of survey methods for comparative organizational research.

Surveys of Morale and Motivation

The advocates of scientific management assumed that people in organizations accepted the formally prescribed roles much as they themselves did. But people evaluate their environment according to their own perceptions and interests. Their evaluations, their satisfactions, and the resulting motive patterns contribute to their behavior in

organizations, and in the aggregate affect the morale of the system. During World War II, when industrial productivity in the United States became a national concern, two government units, one headed by Rensis Likert and the other by Elmo Wilson, conducted studies of morale and motivation in relation to absenteeism and productivity. These studies used multi-organizational designs and quantitative procedures; for example, Hyman and Katz (1947) in a study of absenteeism used a carefully drawn sample of 18 plants and a sub-sample of some 100 workers in each plant.

The use of surveys for examining industrial problems was extended by Likert and his colleagues, a number of whom moved to the University of Michigan in 1946 to found the Survey Research Center. Surveys began to include theoretical issues as well as practical problems. It soon became apparent from a series of studies in large organizations that leadership patterns at the first level influenced employee satisfaction and productivity, and that the relationship between first-line supervisors and employees was in turn heavily influenced by relationships at other echelons in the hierarchy. In other words, these investigations suggested the importance of variables characterizing the system rather than characterizing single personalities or pairs. This recognition led to one of the first large-scale field experiments in organizational psychology, in which the major independent variable manipulated was the degree of hierarchical control in the system (Morse and Reimer, 1956).

A rewarding example of the survey approach to studying organizational properties can be seen in the work of Arnold Tannenbaum (1968) on control in organizations. He selected a critical set of variables concerning power and its distribution in organized structures. These variables, though systemic in their conceptualization, were measured at the individual level and system attributes were determined by the agreement across levels in the organization. The propositions with which Tannenbaum was concerned have been pursued and tested in a variety of settings, culminating in a cross-national (1974) set of studies in which the same relationships were examined in cultures that differed markedly in degree of democratic values and practices, legal context, and worker expectations.

THE PROBLEM OF LEVELS

Organizational psychology, like the social sciences in general, has suffered from a confusion about levels of description and explanation. The older industrial psychology, as we have said, emphasized the individual level and neglected the collective level. Sociologists would say that it dealt with micro rather than macro variables. But what do we

mean by the collective or macro level as compared to the micro or individual level? Are we not dealing with the behavior of individuals in both cases? For the most part we are, but differently. We start with different theoretical orientations, are therefore directed to different aspects of human behavior, and make different uses of individual responses.

In referring to levels, then, we must distinguish between levels of conceptualization and levels of phenomena. The level of phenomena refers to that which can be encountered, observed, measured, and manipulated. The conceptual level has to do with ideas and theories about phenomena. Now in the natural sciences levels differ both with respect to phenomena and with respect to concepts. There is an emergence of phenomena as we ascend the ladder from physics to psychology—the psychological experiences of color vision are not identical with the underlying physiological processes. In the social sciences, however, the distinction between levels is less clear. The product of an industrial plant is the output of a group of people and in that sense it is an emergent phenomenon rather than a mere aggregation of individual acts. But what is directly observable in creating that output are the interrelated acts of individuals. Much of what is regarded as at the sociological level is human behavior of this kind. It is at a higher level conceptually, but not phenomenologically.

Our thesis, then, is that the study of organizations should take the social system level as its conceptual starting point, but that many of the actual measures will be constructed from observations and reports of individual behavior and attitude. Concepts at the system level tell us what particular individual data to gather and how to use them. In studying the introduction of a new piece rate into an industrial enterprise, an individually-oriented psychologist might concentrate on the worker's needs for economic gains. The system-oriented social psychologist would look for the group norms that legitimate production rates. Both researchers would have to observe the behavior of individuals and both would have to put their questions to individuals, but their foci of inquiry and their inferences from data would be different.

Open system theory permits the use of both levels, the conceptual level for macro or system variables, the phenomenal level for the actual facts to be gathered. In looking at the actions of Castro and his followers overthrowing the Batista regime in Cuba in 1958, for example, psychologists would talk about the deprivations and frustrations motivating people to take action against the visible sources of their difficulties. Sociologists might talk about an unstable social system in which a semifeudal society held together by military force collapsed when an agrarian revolution destroyed the military force. Two observations are immediately possible from this example. The sociological analysis is

much broader in scope and attempts to bring into focus a much wider range of related facts. It can do this by the use of such concepts as semifeudal system, which refers to a societal patterning of economic, social, and power relationships. Moreover, the sociological frame of reference, broader in scope, calls attention not so much to a different level of phenomenal facts as to more and different facts of human behavior at the same phenomenal level. The narrower scope of psychological theory again would give us not so much facts of a different level, but more detail about facts that might be passed over very quickly in any sociological description. The trend in sociological research has been in the direction of using the same field methods of study as those of the psychologist, sampling and interviewing and the use of quantitative methods in the observation of behavior. The main difference is that the more global, more all embracing theories of the sociologist are directed at an understanding of the total pattern of events.

Constructs at the macro level, however operationalized, may be too blunt or gross to account for the psychological dynamics at work in social systems. For example, we know in general that a nation in the process of shifting from secondary, or production industry, to tertiary, or service types of industry, will experience changes in the character of its political parties and in the voting behavior of its citizens. Precise predictions of the changes themselves will require knowledge of such factors as the fixation of people upon the identity and values of their old groups, the conditions that facilitate realistic perception of the changes taking place, and the attachment to group values that have no direct relation to occupational clustering. The macro approach is invaluable, however, in underlining the significant problem and directing our attention to areas in which variables need more careful formulation.

The weakness of the micro approach in the past has been twofold. It has dealt with too few of the significant variables in the total situation. It has often seized upon inappropriate variables and has pushed too hard in the direction of showing the universality of some fundamental principle such as reinforcement in the learning theory approach to social problems. This reductionistic emphasis in its very character tends to lose the problem with which it should be concerned. We are limited in our understanding of an organizational outcome such as a strike vote by a union when we try to reduce it to the principles of laboratory learning. We can use learning principles profitably, however, if we can identify a learning problem in the social system in which it arises.

We contend that these weaknesses in the micro approach are readily overcome if we combine this psychological attack with the

concepts available from the macro approach. This procedure involv the translation of the sociological concepts into a host of micro co cepts which are concerned with the same area of social behavior. T translation is made easier by the fact that the two levels by and large not have different types of facts to worry about. The physiological a the psychological can be correlated but not translated; the sensation blueness always remains distinctive as a factual datum from t neuro-chemical process upon which it may be dependent. A role sy tem can, however, be translated into the interdependent and shar values and expectations of legitimate behavior of a group of people

SUMMARY

Past approaches to the study of social problems and social behavior have been limited by a lack of adequate conceptual tools. T limitation has been manifest both in psychology and sociology, although in different ways.

Psychologists have been characteristically unable or unwilling deal with the facts of social organization and social structure. Societies and organizations consist of patterned behaviors, and the behavior of each individual is determined to a considerable extent the requirements of the larger pattern. This context is not often incorporated into psychological theories. Some such theories—the psychoanalytic, for example—deal with the influence of the family on the individual. Others take some account of the small group as the individual environment, and still others are concerned with th influence of culture, that most global of environmental concepts. Even social psychology, however, has neglected the organizational and institutional level, and textbooks of social psychology typically conclude with some treatment of small face-to-face groups. This bo is an attempt to extend such discussions by beginning where they leave off—with the behavior of people in organizations. It is in tha sense a second book in social psychology.

To remedy the shortcomings of psychological theorizing, we propose to follow the approach of open system theory, which emphasizes the system character of social relationships and the transa tions of systems with their environment. This theoretical approach not yet fully developed but important contributions to its growth c be found in the dialectic of Marx, the general systems theory of vo Bertalanffy and J. G. Miller, the event-system conceptualization of H. Allport and the sociological theory of Talcott Parsons. Open sys tem theory seems to us to permit breadth without oversimplificatio It emphasizes, through the basic assumption of entropy, the neces-

sary dependence of any organization upon its environment. The open system concepts of energic input and maintenance point to the motives and behavior of the individuals who are the carriers of energic input for human organizations; the concept of output and its necessary absorption by the larger environment also links the micro and macro levels of discourse. For all these reasons, open system theory represents the point of departure for the chapters that follow.

Open system theory can provide a comprehensive framework for bringing together the advances in organizational research which in themselves are limited and incomplete. Five major sources of input can be readily identified in the history of the field; sociological case studies of individual organizations, traditional industrial psychology of scientific management, the Mayo work and the rediscovery of informal group processes, comparative analysis of organizations, and surveys of morale and motivation.

The problem of scientific levels, specifically of the macro versus the micro approach, is solved once we recognize the common error of confusing theoretical concepts with data. The macro level for the social psychologist is one of theory, of system constructs. The micro level is one of data, of the measurement of human behavior. The varieties and patterns of behavior are many and the events of human behavior can be aggregated and combined in many ways. Concepts from the macro level tell the social psychological observers where to look and how to utilize and combine their observations. But the observations themselves are usually at the micro level; the basic data of social psychology are the acts of human beings.

2
ORGANIZATIONS AND THE SYSTEM CONCEPT

OUTLINE

The aims of social science with respect to human organizations are like those of any other science with respect to the events and phenomena of its domain. Social scientists wish to understand human organizations, to describe what is essential in their form, aspects, and functions. They wish to explain cycles of growth and decline, to predict organizational effects and effectiveness. Perhaps they wish as well to test and apply such knowledge by introducing purposeful changes into organizations—by making them, for example, more benign, more responsive to human needs.

Such efforts are not solely the prerogative of social science, however; common-sense approaches to understanding and altering organizations are ancient and perpetual. They tend, on the whole, to rely heavily on two assumptions: that the location and nature of an organization are given by its name; and that an organization is possessed of built-in goals—because such goals were implanted by its founders, decreed by its present leaders, or because they emerged mysteriously as the purposes of the organizational system itself. These assumptions scarcely provide an adequate basis for the study of organizations and at times can be misleading and even fallacious. We propose, however, to make use of the information to which they point.

THE DEFINITION AND IDENTIFICATION OF ORGANIZATIONS

The first problem in understanding an organization or a social system is its location and identification. How do we know that we are dealing with an organization? What are its boundaries? What behavior belongs to the organization and what behavior lies outside it? Who are the individuals whose actions are to be studied and what segments of their behavior are to be included?

The common-sense answer to such questions begins with the organizational name. The fact that popular names exist to label social organizations, however, is both a help and a hindrance. These labels represent socially accepted stereotypes about organizations and do not specify their role structure, their psychological nature, or their boundaries. On the other hand, these names help in locating the area of behavior in which we are interested. Moreover, the fact that people both within and without an organization accept stereotypes about its nature and functioning is one determinant of its character.

The second key characteristic of the common-sense approach to understanding an organization is to regard it simply as the epitome of the purposes of its designer, its leaders, or its key members.[1] The tele-

[1]See Chapter 15 for a further discussion of the problem of organizational goals.

ology of this approach is again both a help and a hindrance. Sinc human purpose is deliberately built into organizations and is specif cally recorded in the social compact, the by-laws, or other formal pr tocol of the undertaking, it would be inefficient not to utilize thes sources of information. In the early development of a group, man processes are generated that have little to do with its rational purpos but over time there is a cumulative recognition of the devices for orde ing group life and a deliberate use of these devices.

Apart from formal protocol, the primary mission of an organizatio as perceived by its leaders furnishes a highly informative set of clue for the researcher seeking to study organizational functioning. Neve theless, the stated purposes of an organization as given by its by-laws o in the reports of its leaders can be misleading. Such statements o objectives may idealize, rationalize, distort, omit, or even conceal som essential aspects of the functioning of the organization. Nor is ther always agreement about the mission of the organization among it leaders and members. The university president may describe the pu pose of the institution as turning out national leaders; the academi dean sees it as imparting the cultural heritage of the past, the academi vice-president as enabling students to move toward self-actualizatio and development, the graduate dean as creating new knowledge, th dean of students as training young people in technical and professiona skills which will enable them to earn their living, and the editor of th student newspaper as inculcating the conservative values that will pre serve the status quo of an outmoded capitalistic society.

The fallacy here is equating the purposes or goals of organization with the purposes and goals of individual members. The organizatio as a system has an output, a product or an outcome, but this is no necessarily identical with the individual purposes of group member Though the founders of the organization and its key members do thin in teleological terms about organizational objectives, we should no accept such practical thinking, useful as it may be, in place of a theoret ical set of constructs for purposes of scientific analysis. Social science too frequently in the past, has been misled by such shortcuts and ha equated popular phenomenology with scientific explanation.

In fact, the classic body of theory and thinking about organization has assumed a teleology of this sort as the easiest way of identifyin organizational structures and their functions. From this point of viev an organization is a social device for efficiently accomplishing throug group means some stated purpose; it is the equivalent of the blueprin for the design of a machine that is to be created for some practica objective. The essential difficulty with this purposive approach is tha an organization characteristically includes more and less than is indi cated by the design of its founder or the purpose of its leader. Some o the factors assumed in the design may be lacking or so distorted i

operational practice as to be meaningless, while unforeseen embellishments dominate the organizational structure. Moreover, it is not always possible to ferret out the designers of the organization or to discover the intricacies of the design which they carried in their heads. The attempt by Merton (1957) to deal with the latent function of the organization in contrast with its manifest function is one way of dealing with this problem. The study of unanticipated consequences as well as anticipated consequences of organizational functioning is a similar way of handling the matter. Again, however, we are back to the purposes of the creators or leaders, dealing with unanticipated consequences on the assumption that we can discover the consequences anticipated by them and can lump all other outcomes together as a kind of error variance.

It would be much better theoretically, however, to start with concepts that do not call for identifying the purposes of the designers and then correcting for them when they do not seem to be fulfilled. The theoretical concepts should begin with the input, output, and functioning of the organization as a system and not with the rational purposes of its leaders. We may want to employ such purposive notions to lead us to sources of data or as subjects of special study, but not as our basic theoretical constructs for understanding organizations.

Our theoretical model for the understanding of organizations is that of an energic input-output system in which the energic return from the output reactivates the system. Social organizations are flagrantly open systems in that the input of energies and the conversion of output into further energic input consist of transactions between the organization and its environment.

All social systems, including organizations, consist of the patterned activities of a number of individuals. Moreover, these patterned activities are complementary or interdependent with respect to some common output or outcome; they are repeated, relatively enduring, and bounded in space and time. If the activity pattern occurs only once or at unpredictable intervals, we could not speak of an organization. The stability or recurrence of activities can be examined in relation to the *energic input* into the system, the *transformation of energies within the system*, and the *resulting product or energic output*. In a factory the raw materials and the human labor are the energic input, the patterned activities of production the transformation of energy, and the finished product the output. To maintain this patterned activity requires a continued renewal of the inflow of energy. This is guaranteed in social systems by the energic return from the product or outcome. Thus the outcome of the cycle of activities furnishes new energy for the initiation of a renewed cycle. The company that produces automobiles sells them and by doing so obtains the means of securing new raw materials, compensating its labor force, and continuing the activity pattern.

In many organizations outcomes are converted into money and new energy is furnished through this mechanism. Money is a convenient way of handling energy units both on the output and input sides, and buying and selling represent one set of social rules for regulating exchange. Indeed, these rules are so effective and so widespread that there is some danger of mistaking the business of buying and selling for the defining cycles of organization. It is a commonplace executive observation that businesses exist to make money, and the observation is usually allowed to go unchallenged. It is, however, a very limited statement about the purposes of business.

Some human organizations do not depend on the cycle of selling and buying to maintain themselves. Universities and public agencies depend rather on bequests and legislative appropriations, and in so-called voluntary organizations the output reenergizes the activity of organization members in a more direct fashion. Member activities and accomplishments are rewarding in themselves and tend therefore to be continued without the mediation of the outside environment. A society of bird watchers can wander into the hills and engage in the rewarding activities of identifying birds for their mutual edification and enjoyment. Organizations thus differ on this important dimension of the source of energy renewal, with the great majority utilizing both intrinsic and extrinsic sources in varying degree. Most large-scale organizations are not as self-contained as small voluntary groups and are very dependent upon the social effects of their output for energy renewal.

Our two basic criteria for identifying social systems and determining their functions are (1) tracing the pattern of energy exchange or activity of people as it results in some output and (2) ascertaining how the output is translated into energy that reactivates the pattern. We shall refer to organizational functions or objectives not as the conscious purposes of group leaders or group members but as the outcomes that are the energic source for maintenance of the same type of output.

The problem of identifying the boundaries of an organization is solved by following the energic and informational transactions as they relate to the cycle of activities of input, throughput, and output. Behavior not tied to these functions lies outside the system. Many factors are related to the intake of materials into a structure but only those activities concerned with the actual importation of energy or information are part of that structure. Similarly, many processes are associated with the reception of outputs by the environment, but only those activities having to do with export of products are behavioral patterns of the organization. Obviously there is less difficulty in identifying the patterns of behavior responsible for the throughput of the system than for the boundary subsystems that deal with the environment. These subsystems do not always have clearly identifiable borders. Nor can the problem be handled by regarding any behavior of an organizational

member as organizational behavior. A person in a boundary role may interact with members of another system as if he or she belonged to that system. Even the production worker's behavior, although physically taking place within the factory, at times may be social interaction with friends unrelated to the work role. In searching for criteria to define the boundaries of a system one looks for some qualitative break in the nature of the behavior pattern under scrutiny or some sudden quantitative change. These changes can be noted as the same people step out of their organizational roles and behave in radically different fashion or as we move to different people operating in different role systems.

This model of an energic input-output system is taken from the open system theory as promulgated by von Bertalanffy (1956). Theorists have pointed out the applicability of the system concepts of the natural sciences to the problems of social science. It is important, therefore, to examine in more detail the constructs of system theory and the characteristics of open systems.

System theory is basically concerned with problems of relationships, of structure, and of interdependence rather than with the constant attributes of objects. In general approach it resembles field theory except that its dynamics deal with temporal as well as spatial patterns. Older formulations of system constructs dealt with the closed systems of the physical sciences, in which relatively self-contained structures could be treated successfully as if they were independent of external forces. But living systems, whether biological organisms or social organizations, are acutely dependent on their external environment and so must be conceived of as open systems.

Before the advent of open system thinking, social scientists tended to take one of two approaches in dealing with social structures; they tended either (1) to regard them as closed systems to which the laws of physics applied or (2) to endow them with some vitalistic concept like entelechy. In the former case they ignored the environmental forces affecting the organization and in the latter case they fell back upon some magical purposiveness to account for organizational functioning. Biological theorists, however, have rescued us from this trap by pointing out that the concept of the open system means that we neither have to follow the laws of traditional physics, nor in deserting them do we have to abandon science. The laws of Newtonian physics are correct generalizations but they are limited to closed systems. They do not apply in the same fashion to open systems which maintain themselves through constant commerce with their environment, that is, a continuous inflow and outflow of energy through permeable boundaries.

The essential difference between closed and open systems can be seen in terms of the concept of entropy and the second law of thermodynamics. According to the second law of thermodynamics, a system moves toward equilibrium; it tends to run down, that is, its differentiated structures tend to move toward dissolution as the elements composing them become arranged in random disorder. For example, suppose that a bar of iron has been heated by the application of a blowtorch on one side. The arrangement of all the fast (heated) molecules on one side and all the slow molecules on the other is an unstable state, and over time the distribution of molecules becomes in effect random, with the resultant cooling of one side and heating of the other, so that all surfaces of the iron approach the same temperature. A similar process of heat exchange will also be going on between the iron bar and its environment, so that the bar will gradually approach the temperature of the room in which it is located, and in so doing will elevate somewhat the previous temperature of the room. More technically, entropy increases toward a maximum and equilibrium occurs as the physical system attains the state of the most probable distribution of its elements. In social systems, however, structures tend to become more elaborated rather than less differentiated. The rich may grow richer and the poor may grow poorer. The open system does not run down, because it can import energy from the world around it. Thus the operation of entropy is counteracted by the importation of energy and the living system is characterized by negative rather than positive entropy.

COMMON CHARACTERISTICS OF OPEN SYSTEMS

Though the various open systems have common characteristics by virtue of being open, they differ in other characteristics. If this were not the case, we would be able to obtain all our basic knowledge about social organizations through studying biological organisms or even through the study of a single cell.

The following ten characteristics seem to define all open systems.

1. *Importation of energy.* Open systems import some form of energy from the external environment. The cell receives oxygen from the bloodstream; the body similarly takes in oxygen from the air and food from the external world. The personality depends on the external world for stimulation. Studies of sensory deprivation show that a person placed in a darkened soundproof room, with minimal visual and auditory stimulation, develops hallucinations and other signs of mental stress (Solomon et al., 1961). Deprivation of social stimulation also can lead to mental disorganization (Spitz, 1945). In other words, the functioning personality is heavily dependent upon the continuous inflow of stimulation from the external environment. Similarly, social organizations must draw renewed supplies of energy from other institutions, or people, or the material environment. No social structure is self-sufficient or self-contained.

2. *The throughput.* Open systems transform the energy available

to them. The body converts starch and sugar into heat and action. The personality converts chemical and electrical stimuli into sensory qualities, and information into thought patterns. The organization creates a new product, or processes materials, or trains people, or provides a service. These activities entail some reorganization of input. Some work gets done in the system.

3. *The output.* Open systems export some product into the environment, whether it be the invention of an inquiring mind or a bridge constructed by an engineering firm. Even the biological organism exports physiological products such as carbon dioxide from the lungs, which helps to maintain plants in the immediate environment. Continuing to turn out a system product depends on the receptivity of the environment. The stuff that is pumped into the environment may not be absorbed—either the primary product which surfeits the market or the secondary product which pollutes the surrounding air and water.

4. *Systems as cycles of events.* The pattern of activities of the energy exchange has a cyclic character. The product exported into the environment furnishes the sources of energy for the repetition of the cycle of activities. The energy reinforcing the cycle of activities can derive from some exchange of the product in the external world or from the activity itself. In the former instance, the industrial concern utilizes raw materials and human labor to turn out a product which is marketed, and the monetary return is used to obtain more raw materials and labor to perpetuate the cycle of activities. In the latter instance, the voluntary organization can provide expressive satisfactions to its members so that the energy renewal comes directly from the organizational activity itself.

System structure, or the relatedness of parts, can be observed directly when the system itself is physically bounded and its subparts are also bounded within the larger structure. The human body and its various organs constitute such a system. But how do we deal with social structures, where physical boundaries in this sense do not exist? The genius of F. H. Allport (1962) contributed the answer, namely that the structure is to be found in an interrelated set of events that return upon themselves to complete and renew a cycle of activities. It is events rather than things which are structured, so that social structure is a dynamic rather than a static concept. Activities are structured so that they comprise a unity in their completion or closure. A simple linear stimulus-response exchange between two people would not constitute social structure. To create structure, the responses of A would have to elicit B's reactions in such a manner that the responses of the latter would stimulate A to further responses. Of course the chain of events may involve many people, but their behavior can be characterized as showing structure only when there is some closure to the chain by a return to its point of origin, with the probability that the chain of events

will then be repeated. The repetition of the cycle does not have to involve the same set of phenotypical happenings. It may expand to include more subevents of exactly the same kind or it may involve similar activities directed toward the same outcomes. In the individual organism the eye may move in such a way as to have the point of light fall upon the center of the retina. As the point of light moves, the movements of the eye may also change but to complete the same cycle of activity, that is, to focus upon the point of light.

A single cycle of events of a self-closing character gives us a simple form of structure. But such single cycles can also combine to give a larger structure of events or an event system. An event system may consist of a circle of smaller cycles or hoops, each one of which makes contact with several others. Cycles from other types of subsystems may also be tangential to one another. The basic method for the identification of social structures is to follow the energic chain of events from the input of energy through its transformation to the point of closure of the cycle.

5. *Negative entropy.* To survive, open systems must reverse the entropic process; they must acquire negative entropy. The entropic process is a universal law of nature in which all forms of organization move toward disorganization or death. Complex physical systems move toward simple random distribution of their elements and biological organisms also run down and perish. In the long run all open systems are subject to the law of entropy; they lose inputs or the ability to transform them, and die. While they live, however, the entropic process is arrested or reversed. The cycle of input, transformation, and output is essential to system life, and it is a cycle of negative entropy.

Open systems vary in their ability to survive even brief interruptions in this cycle. Some storage capacity, however, is characteristic. By importing more energy from its environment than it expends, the open system can store energy and acquire negative entropy. Within the limits of its storage capacity, an open system tends to maximize its ratio of imported to expended energy, to survive and, even during periods of crisis, to live on borrowed time. Prisoners in concentration camps on a starvation diet will carefully conserve the expenditure of energy, in order to make the limited food go as far as possible (Cohen, 1954). Social organizations will seek to improve their survival position and to acquire in their reserves a comfortable margin of operation.

The entropic process asserts itself in all biological systems as well as in closed physical systems. The energy replenishment of the biological organism cannot maintain indefinitely the complex organizational structure of living tissue. Social systems, however, are not anchored in the same physical constancies as biological organisms and so are capable of almost indefinite arresting of the entropic process. Nevertheless the number of organizations that go out of existence every year is large.

6. *Information input, negative feedback, and the coding process.* The inputs into living systems do not consist only of energic materials that become transformed or altered in the work that gets done. Inputs are also informative in character and furnish signals to the structure about the environment and about its own functioning in relation to the environment. Just as we recognize the distinction between cues and drives in individual psychology, so must we distinguish between informational and energic inputs for all living systems.

The simplest type of informational input found in all systems is negative feedback. Information feedback of a negative kind enables the system to correct its deviations from course. The working parts of the machine feed back information about the effects of their operation to some central mechanism or subsystem which acts on such information to keep the system on target. The thermostat that controls the temperature of the room is a simple example of a regulatory device which operates on the basis of negative feedback. The automated power plant would furnish more complex examples. Miller (1955) emphasizes the critical nature of negative feedback in his proposition: "*When a system's negative feedback discontinues, its steady state vanishes, and at the same time its boundary disappears and the system terminates*" (p. 529). If there is no corrective device to get the system back on its course, it will expend too much energy or it will ingest too much energic input and no longer continue as a system.

The reception of inputs into a system is selective. Not all energic inputs can be absorbed into every system. The digestive system of living creatures assimilates only those inputs to which it is adapted. Similarly, systems can react only to those information signals to which they are attuned. The general term for the selective mechanisms of a system by which incoming materials are rejected or accepted and translated for the structure is coding. Through the coding process the "blooming, buzzing confusion" of the world is simplified into a few meaningful and basic categories for a given system. The nature of the functions performed by the system determines its coding mechanisms, which in turn perpetuate this type of functioning.

7. *The steady state and dynamic homeostasis.* The importation of energy to arrest entropy operates to maintain some constancy in energy exchange, so that open systems that survive are characterized by a steady state. A steady state is not a motionless or true equilibrium. There is a continuous inflow of energy from the external environment and a continuous export of the products of the system, but the character of the system, the ratio of the energy exchanges and the relations between parts, remains the same. The catabolic and anabolic processes of tissue breakdown and restoration within the body preserve a steady state so that the organism from time to time is not the identical organism it was but a highly similar organism. The steady state is seen in clear form in the homeostatic processes for the regulation of body temperature; external conditions of humidity and temperature may vary, but the temperature of the body remains the same. The endocrine glands are a regulatory mechanism for preserving an evenness of physiological functioning. The general principle here is that of Le Châtelier (see Bradley and Calvin, 1956), who maintains that any internal or external factor that threatens to disrupt the system is countered by forces which restore the system as closely as possible to its previous state. Krech and Crutchfield (1948) similarly hold, with respect to psychological organization, that cognitive structures will react to influences in such a way as to absorb them with minimal change to existing cognitive integration. The initial adjustment to such disturbances is typically approximate rather than precise. If it is insufficient, further adjustment in the same direction will follow. If it is excessive, it will be followed by a counteradjustment. The iterative process will then continue to the point of equilibrium or until the process is broken by some further disruptive event. A temporal chart of activity will thus show a series of ups and downs instead of a smooth curve. Moreover, the system itself is in motion. Its equilibrium, as Lewin (1947) put it, is quasi-stationary, more like the constant depth of a flowing river than a still pond. *The basic principle is the preservation of the character of the system.*

The homeostatic principle must be qualified in one further respect in its application to complex living systems: in counteracting entropy these systems move toward growth and expansion. This apparent contradiction can be resolved, however, if we recognize the complexity of the subsystems and their interaction in anticipating changes necessary for the maintenance of an overall steady state. Stagner (1951) has pointed out that the initial disturbance of a given tissue constancy within the biological organism will result in mobilization of energy to restore the balance, but that recurrent upsets will lead to actions to anticipate the disturbance:

> We eat before we experience intense hunger pangs. . . . energy mobilization for forestalling tactics must be explained in terms of a *cortical tension* which reflects the visceral-proprioceptive pattern of the original biological disequilibration. . . . *Dynamic homeostasis* involves the maintenance of tissue constancies by establishing a constant physical environment—by reducing the variability and disturbing effects of external stimulation. Thus the organism does not simply restore the prior equilibrium. A new, more complex and more comprehensive equilibrium is established. (p. 5)

Growth is one form of this tendency toward equilibria of increasing complexity and comprehensiveness. In preserving its character, the system tends to import more energy than is required for its output, as we noted in discussing negative entropy. To insure survival, systems operate to acquire some margin of safety beyond the immediate level of existence. The body will store fat, the social organization will build up reserves, the society will increase its technological and cultural base. Miller (1955) has formulated the proposition that the rate of growth of a system—within certain ranges—is exponential if it exists in a medium that makes available unrestricted amounts of energy for input.

In adapting to their environment, systems will attempt to cope with external forces by ingesting them or acquiring control over them. The physical boundedness of the single organism means that such attempts to control the environment affect the behavioral system rather than the biological system of the individual. Social systems will move, however, toward incorporating within their boundaries the external resources essential to survival. Again the result is an expansion of the original system.

Thus, the steady state, which at the simple level is one of homeostasis over time, at more complex levels becomes one of preserving the character of the system through growth and expansion. The basic system does not change directly as a consequence of expansion. The most common growth pattern is a multiplication of the same type of cycles or subsystems—a change in quantity rather than in quality. Animal and plant species grow by multiplication. A social system adds more units of the same essential type as it already has. Haire (1959) has studied the ratio between the sizes of different subsystems in growing business organizations. He found that though the number of people increased in both the production subsystem and the subsystem concerned with the external world, the ratio of the two groups remained constant. Qualitative change does occur, however, in two ways. In the first place, quantitative growth calls for supportive subsystems of a specialized character not necessary when the system was smaller. In the second place, there is a point where quantitative changes produce a qualitative difference in the functioning of a system. A small college that triples its size is no longer the same institution in terms of the relation between its administration and faculty, relations among the various academic departments, or the nature of its instruction.

In short, living systems exhibit a growth or expansion dynamic in which they maximize their basic character. They react to change or they anticipate change through growth which assimilates the new energic inputs to the nature of their structure. In terms of Lewin's quasi-stationary equilibrium, the ups and downs of the adjustive process do not always result in a return to the old level. Under certain circumstances a solidification or freezing occurs during one of the adjustive cycles. A new base line is thus established and successive movements fluctuate around this level, which may be either above or below the previous plateau of operation.

8. *Differentiation.* Open systems move in the direction of differentiation and elaboration. Diffuse global patterns are replaced by more specialized functions. The sense organs and the nervous system evolved as highly differentiated structures from the primitive nervous tissues. The growth of the personality proceeds from primitive, crude organizations of mental functions to hierarchically structured and well-differentiated systems of beliefs and feelings. Social organizations move toward the multiplication and elaboration of roles with greater specialization of function. In the United States today medical specialists now outnumber the general practitioners.

One type of differentiated growth in systems is what von Bertalanffy (1956) terms progressive mechanization. It finds expression in the way in which a system achieves a steady state. The early method is a process that involves an interaction of various dynamic forces, whereas the later development entails the use of a regulatory feedback mechanism. He writes:

> It can be shown that the *primary* regulations in organic systems, that is, those which are most fundamental and primitive in embryonic development as well as in evolution, are of such nature of dynamic interaction. . . . Superimposed are those regulations which we may call *secondary,* and which are controlled by fixed arrangements, especially of the feedback type. This state of affairs is a consequence of a general principle of organization which may be called progressive mechanization. At first, systems—biological, neurological, psychological or social—are governed by dynamic interaction of their components; later on, fixed arrangements and conditions of constraint are established which render the system and its parts more efficient, but also gradually diminish and eventually abolish its equipotentiality. (p. 6)

9. *Integration and Coordination.* As differentiation proceeds, it is countered by processes that bring the system together for unified functioning. Von Bertalanffy (1956) spoke of progressive mechanization in the regulatory processes of organic systems, the replacement of dynamic interaction by fixed control arrangements. In social systems, in contrast to biological systems, there are two different paths for

achieving unification, which Georgopoulos (1975) calls coordination and integration.[2] Coordination is analogous to von Bertalanffy's fixed control arrangements. It is the addition of various devices for assuring the functional articulation of tasks and roles—controlling the speed of the assembly line, for example. Integration is the achievement of unification through shared norms and values.

In organisms, hormonal and nervous subsystems provide the integrating mechanisms. In social systems, without built-in physical mechanisms of regulation, integration is often achieved at the small group level through mutually shared psychological fields (see chapter 12). For large social organizations, coordination, rather than integration, is the rule for providing orderly and systematic articulation—through such devices as priority setting, the establishment and regulation of routines, timing and synchronization of functions, scheduling and sequencing of events.

10. *Equifinality.* Open systems are further characterized by the principle of equifinality, a principle suggested by von Bertalanffy in 1940. According to this principle, a system can reach the same final state from differing initial conditions and by a variety of paths. The well-known biological experiments on the sea urchin show that a normal creature of that species can develop from a complete ovum, from each half of a divided ovum, or from the fusion product of two whole ova. As open systems move toward regulatory mechanisms to control their operations, the amount of equifinality may be reduced.

SOME CONSEQUENCES OF VIEWING ORGANIZATIONS AS OPEN SYSTEMS

Like most innovations in scientific theory, the open system approach was developed in order to deal with inadequacies in previous models. The inadequacies of closed system thinking about organizations became increasingly apparent during the midcentury decades of rapid societal change. The limitations of empirical research based on closed system assumptions also pointed up the need for a more comprehensive theoretical approach. The consequences, or rather the potentialities, of dealing with organizations as open systems can best be seen in contrast to the limitations and misconceptions of closed system thinking. The most important of these misconceptions, almost by definition, is the failure to recognize fully the dependence of organi-

[2]This distinction is similar to the one formulated by Nancy Morse on *binding-in* and *binding-between* functions—the binding-in referring to the involvement of people in the system, the binding-between referring to the ties between system parts. (Unpublished manuscript.)

zations on inputs from their environment. That inflow of materials and energy is neither constant nor assured, and when it is treated as a constant much of organizational behavior becomes unexplainable. The fact that organizations have developed protective devices to maintain stability and that they are notoriously difficult to change or reform should not be allowed to obscure their dynamic relationships with the social and natural environment. Changes in that environment lead to demands for change in the organization, and even the effort to resist those demands results in internal change.

It follows that the study of organizations should include the study of organization-environment relations. We must examine the ways in which an organization is tied to other structures, not only those that furnish economic inputs and support but also structures that can provide political influence and societal legitimation. The open-system emphasis on such relationships implies an interest in properties of the environment itself. Its turbulence or placidity, for example, limits the kinds of relationships that an organization can form with systems in the environment and indicates also the kinds of relationships that an organization will require to assure its own survival.

The emphasis on openness is qualified, however. There is a duality to the concept of open system; the concept implies openness but it also implies system properties, stable patterns of relationships and behavior within boundaries. Complete openness to the environment means loss of those properties; the completely open organization would no longer be differentiated from its environment and would cease to exist as a distinct system. The organization lives only by being open to inputs, but selectively; its continuing existence requires both the property of openness and of selectivity.

The open system approach requires study of these selective processes, analysis of those elements in the environment that are actively sought, those disregarded, and those kept out or defended against. The basis of these choices, the means employed for their implementation, and the consequences for organizational effectiveness and survival becomes topics for research. In well-established organizations the internal arrangements for making and implementing such choices are highly developed, a fact that often allows such organizations to withstand environmental turbulence better than the reform or revolutionary movements that seek to displace them. Sustained supportive inputs are less predictable for groups attempting social change.

A second serious deficiency in closed system thinking, both theoretical and pragmatic, is overconcentration on principles of internal functioning. This could be viewed as merely another aspect of disregard for the environment, but it has consequences of its own. Internal moves are planned without regard for their effects on the envi-

ronment and the consequent environmental response. The effects of such moves on the maintenance inputs of motivation and morale tend not to be adequately considered. Stability may be sought through tighter integration and coordination when flexibility may be the more important requirement. Coordination and control become ends in themselves, desirable states within a closed system rather than means of attaining an adjustment between the system and its environment. Attempts to introduce coordination in kind and degree not functionally required tend to produce new internal problems.

Two further errors derive from the characteristic closed system disregard of the environment and preoccupation with internal functions—the neglect of equifinality and the treatment of disruptive external events as error variance. The equifinality principle simply asserts that there are more ways than one of producing a given outcome. In a completely closed system, the same initial conditions must lead to the same final result; nothing has changed and therefore nothing changes. In open systems, however, the principle of equifinality applies; it holds true at the biological level, and it is more conspicuously true at the social level. Yet in practice most armies insist that there is one best way for all recruits to assemble their guns; most coaching staffs teach one best way for all baseball players to hurl the ball in from the outfield. And in industry the doctrine of scientific management as propounded by Taylor and his disciples begins with the assumption of the one best way: discover it, standardize it, teach it, and insist on it. It is true that under fixed and known conditions there is one best way, but in human organizations the conditions of life are neither fixed nor fully known. Such organizations are better served by the general principle, characteristic of all open systems, that there need not be a single method for achieving an objective.

The closed system view implies that irregularities in the functioning of a system due to environmental influences are error variances and should be treated accordingly. According to this conception, they should be controlled out of studies of organizations. From the organization's own operations they should be excluded as irrelevant and should be guarded against. The decisions of officers to omit a consideration of external factors or to guard against such influences in a defensive fashion, as if they would go away if ignored, is an instance of this type of thinking. So is the now outmoded "public be damned" attitude of business executives toward the clientele upon whose support they depend. Open system theory, on the other hand, would maintain that environmental influences are not sources of error variance but are integral to the functioning of a social system, and that we cannot understand a system without a constant study of the forces that impinge upon it.

Finally, thinking of organizations as closed systems results in failure to understand and develop the feedback or intelligence function, the means by which the organization acquires information about changes in the environment. It is remarkable how weak many industrial companies are in their market research departments when they are so dependent on the market. The prediction can be hazarded that organizations in our society will increasingly move toward the improvement of the facilities for research in assessing environmental forces. We are in the process of correcting our misconception of the organization as a closed system, but the process is slow.

Open system theory, we believe, has potentialities for overcoming these defects in organizational thinking and practice. Its potentialities, however, cannot be realized merely by acknowledging the fact of organizational openness; they must be developed. Open is not a magic word, and pronouncing it is not enough to reveal what has been hidden in the organizational cave. We have begun the process of specification by discussing properties shared by all open systems. We turn next to the special properties of human organizations, as one category of such systems.

SUMMARY

The open system approach to organizations is contrasted with common-sense approaches, which tend to accept popular names and stereotypes as basic organizational properties and to identify the purpose of an organization in terms of the goals of its founders and leaders.

The open system approach, on the other hand, begins by identifying and mapping the repeated cycles of input, transformation, output, and renewed input which comprise the organizational pattern. This approach to organizations represents the adaptation of work in biology and in the physical sciences by von Bertalanffy and others.

Organizations as a special class of open systems have properties of their own, but they share other properties in common with all open systems. These include the importation of energy from the environment, the throughput or transformation of the imported energy into some product form that is characteristic of the system, the exporting of that product into the environment, and the reenergizing of the system from sources in the environment.

Open systems also share the characteristics of negative entropy, feedback, homeostasis, differentiation, coordination and equifinality. The law of negative entropy states that systems survive and maintain their characteristic internal order only as long as they import from

the environment more energy than they expend in the process of transformation and exportation. The feedback principle has to do with information input, which is a special kind of energic importation, a kind of signal to the system about environmental conditions and about the functioning of the system in relation to its environment. The feedback of such information enables the system to correct for its own malfunctioning or for changes in the environment, and thus to maintain a steady state or homeostasis. This is a dynamic rather than a static balance, however. Open systems are not at rest but tend toward differentiation and elaboration, both because of subsystem dynamics and because of the relationship between growth and survival. 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.

Traditional organizational 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. It has led also to an overconcentration on principles of internal organizational functioning, with consequent failure to develop and understand the processes of feedback which are essential to survival.

3

DEFINING CHARACTERISTICS OF SOCIAL ORGANIZATIONS

OUTLINE