

*American Handbook of Psychiatry*

# **GENERAL SYSTEM THEORY & PSYCHIATRY**

**Ludwig von Bertalanffy**

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# GENERAL SYSTEM THEORY AND PSYCHIATRY

Ludwig von Bertalanffy

## The Quandary of Modern Psychology

In recent years the concept of system has gained increasing influence in psychology and psychopathology. Numerous investigations have referred to general system theory or to some part of it, Gordon W. Allport ended the re-edition of his classic with "Personality as System"; Karl Menninger based his system of psychiatry on general system theory and organismic biology; Rapoport even spoke of the "epidemiclike popularity in psychology of open systems." The comprehensive works by Grinker and Gray, Duhl, and Rizzo, presenting general system theory and psychiatry (or unified theory in Grinker's term) in a broad frame of general considerations and specific psychiatric questions and applications, are indispensable for this study. With special gratification the present writer may cite the agreement of the two deans of American psychiatry. If there be a third revolution in psychiatry (after the behavioristic and psychoanalytic), says Grinker, it is in the development of general (systems) theory; and Karl Menninger honored von

Bertalanffy as “one of his most influential teachers.” The question arises why this trend has appeared.<sup>[1]</sup>

Systems thinking in psychiatry is part of a global reorientation that extends over the spectrum of intellectual life. It essentially is the search for new “paradigms” in scientific thinking, to use Thomas Kuhn’s poignant expression, after the paradigm of classical mechanistic thinking, which started with the scientific revolution of the sixteenth and seventeenth centuries, had reached its boundaries, and its limits as a scientific method, a theory, and a world view became apparent.

In the sciences from physics to the biological and social sciences and the humanities, the paradigm of an analytical-elementalistic-summative approach reached its limits wherever problems circumscribed by notions like “system,” “wholeness,” “teleology,” and the like appeared and demanded new ways of thinking. This was the case in physics as the limitations of classical theory were discovered; in the life sciences with the innumerable problems of order and organization of parts and processes in the living organism; in psychology with the problems of personality; in the social sciences with the problems of organizations both natural (family, tribe, and the like) and formal (an army or bureaucracy). Similarly technology transcended the traditional fields of (mechanical, electric, chemical, etc.) engineering and had to meet both in its “hardware” and “software” with essentially new requirements of

communication and control," man-machine systems, system analysis of industrial, commercial, economic, ecological, military, and political problems up to the social problems and international relations. And the surfeit of social criticism, new philosophies, counterculture, and social utopias, in its motivation and in often grotesque ways, equally expresses the discontent with the world view of yesterday and the search for a new one.

Such need was especially felt in psychology and psychiatry. American psychology in the first half of the twentieth century was dominated by the concept of the reactive organism, or, more dramatically, by the model of man as a robot. This conception was common to all major schools of American psychology, classical and neobehaviorism, learning and motivation theories, psychoanalysis, cybernetics, the concept of the brain as a computer, and so forth. According to a leading personality theorist:

Man is a computer, an animal, or an infant. His destiny is completely determined by genes, instincts, accidents, early conditionings and reinforcements, cultural and social forces. Love is a secondary drive based on hunger and oral sensations or a reaction formation to an innate under-King bate. In the majority of our personological formulations there are no provisions for creativity, no admitted margins of freedom for voluntary decisions, no fitting recognitions of the power of ideals, no bases for selfless actions, no ground at all for any hope that the human race can save itself from the fatality that now confronts it. If we psychologists were all the time, consciously or unconsciously, intending out of malice to reduce the concept of human nature to its lowest common denominator, and were gloating over our successes in so doing, then we might have to admit that to this extent the Satanic spirit was alive within us.



The tenets of robot psychology have been extensively criticized in the works by Allport, Matson, Koestler, Bertalanffy, and others. The theory, nevertheless, remained dominant for obvious reasons. The concept of man as a robot was both an expression of and a powerful motive force in industrialized mass society. It was the basis for behavioral engineering in commercial, economic, political, and other advertising and propaganda; the expanding economy of the “affluent society” could not subsist without such manipulation. Only by manipulating humans ever more into Skinnerian rats, robots, buying automata, homeostatically adjusted conformers and opportunists (or bluntly speaking, into morons and zombies) can this great society follow its progress toward an ever increasing gross national product. As a matter of fact,” the principles of academic psychology were identical with those of the “pecuniary conception of man.”

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Since the present article was first written (1964), a number of fashions in psychology and psychiatry have come and gone without, however, essentially changing the predominant “robot” or “zoomorphie” model of man. It may be helpful for the present exposition briefly to enumerate the major currents that, partly with sensational success, have appeared in the intervening period.

1. *Ethology*, the comparative study of animal behavior, was broadly used for the zoomorphie theory, that is, the reduction of human to animal modes of behavior. It is obvious that all too much of human behavior has biological roots; and few periods of human history have more vividly experienced the bestiality of man under the thin veneer of so-called civilized society. It is not a new discovery that, as man is an animal, more specifically an anthropoid ape in his anatomy, histology, biochemistry, physiology, and so forth, he also shares many behavioral

mechanisms with his animal forebears and relatives. Study of his “biological drives,” sex and aggression in particular, obviously is urgent in order to recognize and, if possible, to educate them. However, a “reductionist” theory, the contention that man is “nothing but” a naked ape, was certainly not the intention of the pioneers of ethology, who, like Lorenz, emphasized man’s uniqueness expressed by obvious facts like culture, tradition, history, and the like. Such reticence was alien to works of a sensationalist nature, which, on the basis of often most specious arguments, derived great popular success from the zoomorphic doctrine. Probably this success originated in the masochism of contemporary society thus finding alleviation of guilt feelings. Modern atrocities, criminality, and the like are more easily excused and tolerated when they come from man’s biological, irresistible “aggressive drives.” Similarly sex research and manuals for sexual practice belong to the same trend to discard what specifically “human” may be left in this technical and commercial but otherwise inhuman age.<sup>[2]</sup>

2. Under the banner of a “third force” in psychology (versus behaviorism and psychoanalysis), a new *“humanistic” psychology* was introduced. Its leaders, such as Maslow, Charlotte Bühler, Matson, and others, exerted a thoroughly admirable influence by emphasizing the specifics of human psychology, the necessity of considering the healthy not the sick as the basic model, the investigation of the human life course, the emphasis (as against the supposedly solely normal, utilitarian behavior of the average American in commercialized society) on self-realization, “peak experience,” “being cognition,” and so forth. The reaction against the emotional emptiness of our society is equally understandable. Soon, however, the movement submitted to commercialism. Encounter groups and the “Human Potential Movement” became an industry run by practitioners (called “trainers” in a significant and revealing appellation) with highly questionable credentials. While in part using respectable techniques of group therapy, “humanistic psychology” became big business that, with T-groups, sensitivity training, nude marathons, and the like, offered a way out of the boredom of affluent society and a shortcut to an emotional “high,” with sometimes devastating results. At the same time the alleged “humanism” became “zoomorphic” in a somewhat modified way. Salvation was sought in the “group,” and consequently the individual was reduced to the lowest common denominator, becoming an

“undifferentiated and diffused region in a social space,” his self obliterated by manipulative psychology and the techniques of social engineering.” In this somewhat roundabout way commercialism and dehumanization, deplored as the worst outgrowth of industrial mass society, were reaffirmed by voluntary, well-paying customers.

3. The well-known illnesses of present society were frontally attacked by the advocates of the counterculture and Consciousness III. The criticism of corporate society and the psychological wasteland of our times was appropriate enough. The remedies proposed: drugs, rock music, beards, bell-bottom trousers, commune living, and exotic religions—and this is the rather complete list of what the counterculture has to offer for saving humanity—were juvenile and silly. Not only rock festivals and students’ protests but also the counterculture as a whole seems on the wane, after a surprisingly short life span for a worldwide “revolution” with highest aspirations to remodel society.

4. And here the circle closes. For apparently the latest major development (as of February 1972) is the success (with supposedly 200,000 copies sold) of Skinner’s recent book, *Beyond Freedom and Dignity*, which is the revival or rather the reiteration of old-fashioned behaviorism. It disregards that in the meantime animal experimentation has demonstrated that even rodent behavior in wildlife situations does not follow the conditioning scheme. Conventional learning theory presently seems to apply to laboratory artifact (positive reinforcement in the Skinner cage, classical conditioning in nonsense- syllable learning, and similar techniques in advertising) but neither to natural animal behavior nor to the normal psychological development of the child.” Behavior therapy seems successful in certain pathology, especially bed-wetting, but it is more dubitable whether the same principles apply to the education of Einsteins, Mozarts, and even of ordinary citizens. Nevertheless, behaviorism came back with a vengeance and a high measure of intolerance with Skinner’s most recent work.

There is no need to enter into a discussion of *Freedom and Dignity* that is of an essentially philosophical or possibly verbal nature. But it would appear that Skinner has never seen a Gothic cathedral, or even the skyscrapers of New York, never heard music from Beethoven’s Ninth to the

cheapest rock hit, never thought about his own laboratory, books, and university—and never made the somewhat trivial observation that rats, pigeons, and apes just don't do any such tilings. It is well in its place to look at the animal world for the first beginnings of language, use of tools, tradition, and the like. But human psychology cannot possibly ignore that the world of culture (of symbolic activities, to use this writer's phraseology) is something new, an emergent that cannot lie reduced to the levels of conditioning and learning theory.<sup>[3]</sup>

Such a survey of the past eight years is useful because it shows that the kaleidoscopically changing fashions and fads in psychology (and psychiatry) actually did not alter the basic presuppositions or paradigm of American psychology. The patient on the couch, the rat in the Skinner box, the stickleback aggressively defending his territory, the T-group undergoing sensitivity training (preferably in the state of nudity), and the drug experience certainly are rather different "models of man." But they agree in the basic paradigm, namely, the neglect or "bracketing out" of what is specifically human; the consequent reduction of human to animal behavior; further, the environmentalism seeing human behavior as a product of outer factors (such as childhood experience, reinforcement, group training, the implements of the counterculture, as the prevailing theory may be), but never seeing specifically human or individual factors; and the resulting manipulation by psychoanalysis or conditioning or sensitivity training or folk music and drugs. A new paradigm is demanded to effectuate a "revolution" in this and other sciences and in practical life and society as well.

The enormous threat contained in Skinner's latest work is that his is not a program or project to undo *Freedom and Dignity*, but a description of what is widely realized in the thought control exerted by the mass media, television, commercial society, and politics. The question whether or not the "controllers" consciously followed the academic theory of passive and operant conditioning is inconsequential, although one would suspect that they often do.

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Modern society, provided a large-scale experiment in manipulative

psychology. If its principles are correct, conditions of tension and stress should lead to an increase of mental disorder. On the other hand, mental health should be improved when basic needs for food, shelter, personal security, and so forth are satisfied; when repression of infantile instincts is avoided by permissive training; when scholastic demands are reduced so as not to overload a tender mind; when sexual gratification is provided at an early age, and so on.

The behavioristic experiment led to results contrary to expectation. World War II—a period of extreme physiological and psychological stress—did not produce an increase in neurotic or psychotic disorders, apart from direct shock effects such as combat neuroses. In contrast, the affluent society produced an unprecedented number of mentally ill. Precisely under conditions of reduction of tension and gratification of biological needs, novel forms of mental disorder appeared as existential neurosis, malignant boredom, and retirement neurosis, that is, forms of mental dysfunction originating not from repressed drives, from unfulfilled needs, or from stress but from the meaninglessness of life. There is the suspicion' (although not substantiated statistically) that the recent increase in schizophrenia may be caused by the "other-directedness" of man in modern society. And there is no doubt that in the field of character disorders, a new type of juvenile delinquency has appeared; crime not for want or passion, but for the fun of it, for "getting a kick," and born from the emptiness of life. As Erich Fromm

recently asserted, boredom is “the illness of the age” and the root of its violence in war and crime.

Thus theoretical as well as applied psychology was led into a malaise regarding basic principles. This discomfort and the trend toward a new orientation were expressed in many different ways, such as in the various neo-Freudian schools, ego psychology, personality theories (Murray, Allport), the belated reception of European developmental and child psychology (Piaget, Werner, Charlotte Bühler), the “new look” in perception, self-realization (Goldstein, Maslow), client-centered therapy (Rogers), phenomenological and existential approaches, sociological concepts of man (Sorokin), and others. In the variety of these currents there is one common principle: to take man not as a reactive automaton or robot but as *an active personality system*.

Therefore, the reason for the current interest in general system theory appears to be that it is hoped that it may contribute toward a more adequate conceptual framework for normal and pathological psychology.

## Why Systems Research?

In the past few decades scientific developments have taken place that can be subsumed under the general title of “systems research.” They concern a broad front in the scientific endeavor encompassing biology, psychology,

behavioral and social science, technology, and other sciences. Although differing in theoretical structure, models, mathematical methods, and so forth, these developments are similar in their motives and aims. Representative of these new disciplines are general system theory, cybernetics, information theory, game and decision theory, and others. These theoretical approaches are paralleled by developments in applied science arising from the increasing complexities in technology, automation, and society in general, such as systems engineering, operations research, and the like. In recent years academic programs and job denominations have appeared that go under the name of “systems research” (or some variant) and are novel in comparison to traditional specialties. (For an introduction into the field, the following works are suggested: von Bertalanffy, Klir, Buckley, Gray *et al.*, Miller, Rapoport.)

The emergence of a “system science” is based on three major considerations:

1. Up to recent times physics was the only “exact” science, that is, the only science permitting explanation, prediction, and control within a highly developed conceptual (mathematical) framework. With the rise of biological, behavioral, and social sciences, the need for similar theoretical constructs became apparent. Simple application of physics does not suffice for this purpose. Hence a *generalization* of scientific concepts became necessary.

2. The encounter with biological, behavioral, and social problems has shown that traditional science cannot account for many aspects that are predominant in these fields. Interaction in multivariable systems, organization, differentiation, self-maintenance, goal-directedness, and the like are of fundamental importance in biological, behavioral, and social phenomena. These aspects cannot be bypassed by declaring them to be “unscientific” or “metaphysical” by decree of a physicalistic and obsolete metaphysics. Hence generalization of scientific concepts implies the *introduction of new categories*.
3. Such expanded and generalized theoretical constructs are *interdisciplinary*; that is, they transcend the traditional compartments and are applicable to phenomena in different divisions of science.

These developments are comparatively novel and largely provide “explanation on principle” rather than detailed explanations and predictions. However, the same was, and still is, true of the great theories of Darwin and Freud. And in the present status of psychology and psychopathology the need is for new ways of conceptualization to permit recognition of problems and aspects that previously were overlooked or were intentionally excluded.

## General System Theory and Cybernetics

Within the present context cybernetics, in its formulation as



homeostasis, and general system theory, in its application to dynamic systems, are of special interest. The relation of both theories is not always well understood, and cybernetics is sometimes identified with general system theory. Hence a clarification is in order.

The basic model of *cybernetics* is the feedback scheme:

Stimulus → Message / Message → Response

Complex *feedback arrangements* found in modern servomechanisms and automation, as well as in the organism, can be resolved into aggregates of feedback circuits of this type. Applied to the living organism, the feedback scheme is called “homeostasis”; at least this is the common usage of a term that can be given different meanings. Homeostasis is the ensemble of regulations that maintain variables constant and direct the organism toward a goal, and are performed by feedback mechanisms; that is, the result of the reaction is monitored back to the “receptor” side so that the system is held stable or led toward a target or goal. The simplest illustration is thermoregulation both by the familiar thermostat and in the warm-blooded organism; a large number of physiological and behavioral regulations are controlled by feedback mechanisms of sometimes extraordinary complexity.

*General system theory* pertains to principles that apply to systems in general. A system is defined as a complex of components in mutual

interaction. General system theory contends that there are principles of systems in general or in defined subclasses of systems, irrespective of the nature of the systems, of their components, or of the relations or “forces” between them. System principles may be expressed in mathematical models, may often be simulated by electronic or other analogues; they have been applied in numerous fields of pure and applied science. Concepts and principles of system theory are not limited to material systems, but can be applied to any “whole” consisting of interacting “components,” as especially practical applications in systems engineering show.

A case particularly important for the living organism is that of *open systems*, that is, systems maintained in the exchange of matter with the environment, by import and export and the building up and breaking down of components. Open systems, compared to closed systems of traditional physics, show singular characteristics. An open system may attain a *steady state* in which it remains constant, but in contrast to conventional equilibriums, this constancy is one of continuous exchange and flow of component material. The steady state of open systems is characterized by *equifinality*; that is, in contrast to equilibriums in closed systems, which are determined by initial conditions, the open system may attain a time-independent state that is independent of initial conditions and determined only by the system parameters. Open systems show *thermodynamic characteristics* that are apparently paradoxical. According to the Second Law

of Thermodynamics, the general course of physical events (that is, in closed systems) is directed toward increasing entropy, leveling down differences and states of maximum disorder. In open systems the import of “negative entropy” is possible with the transfer of matter. Hence such systems can maintain themselves in states of high improbability and at a high level of order and complexity; they may even advance toward increasing order and differentiation, as is the case in development and evolution.

General systems and cybernetics are applicable to certain ranges of phenomena. In some cases either model may be applied, and the equivalence of description in the “languages” of cybernetics (feedback circuits) and dynamical system theory (interactions in a multivariable system) can be shown. We note that no scientific model is monopolistic; each may reproduce, more or less successfully, certain aspects of reality. The present chapter is limited to general system theory in the narrower sense, excluding cybernetics, information theory, etc., in their possible applications to psychiatry. Within the space available only a small selection of key concepts, annotated by examples relevant to psychiatry or psychological theory, can be presented.

## **System Concepts in Psychopathology**

General system theory has its roots in the organismic conception in

biology. On the European continent this was developed by the present author in the 1920's, with parallel developments in the Anglo-Saxon countries (Whitehead, Woodger, Coghill, and others) and in psychological Gestalt theory (W. Köhler). It is interesting to note that Eugen Bleuler followed with sympathetic interest this development in its early phase. A similar development in psychiatry was represented by Goldstein. Somewhat later the homeostasis principle became recognized in physiology through Cannon's work. Organismic biology introduced the concept of the organism as an open system, which led to important expansions of physical theory, especially in thermodynamics. A further generalization was the proposal of an interdisciplinary "general system theory." In a somewhat parallel way developments in communication engineering, computers, and servomechanisms led to cybernetics as an interdisciplinary field. The proposal of general system theory entailed the unexpected discovery that similar trends were active in many fields of the behavioral and social sciences. These tendencies joined in the formation of the Society for General Systems Research (1954), which since has tried to serve as a unifying agency for such studies.

Like other fundamental conceptions (for example, the atomic theory, the machine theory of organism, the cyclic theory of history, the positivistic theory in philosophy of science), the modern system concept has a long history. In biology and medicine one may trace it to Claude Bernard and the

Paracelsian-Hippocratic tradition; in psychology and philosophy, to the Leibnitzian tradition, Nicholas of Cusa, and even further. It appears, however, that the idea of a science of systems could emerge only at the present state of scientific development.

## **Organism and Personality**

In contrast to physical forces such as gravity or electricity, the phenomena of life are found only in individual entities called organisms. Any organism is a system, that is, a dynamic order of parts and processes standing in mutual interaction. Similarly psychological phenomena are found only in individualized entities that in man are called personalities. "Whatever else personality may be, it has the properties of a system" (p. 109).

The "molar" concept of the psychophysical organism as a system contrasts with its conception as a mere aggregate of "molecular" units such as reflexes, sensations, brain centers, drives, reinforced responses, traits, factors, and the like. Psychopathology clearly shows mental dysfunction as a system disturbance rather than as a loss of single functions. Even in localized traumata (for example, cortical lesions) the ensuing effect is impairment of the total action system, particularly with respect to higher and, hence, more demanding functions. Conversely, the system has considerable regulative capacities.

## The Active Organism

“Even without external stimuli, the organism is not a passive but an intrinsically active system. Reflex theory has presupposed that the primary element of behavior is response to external stimuli. In contrast, recent research shows with increasing clarity that autonomous activity of the nervous system, resting in the system itself, is to be considered primary. In evolution and development, reactive mechanisms appear to be superimposed upon primitive rhythmic-locomotor activities. The stimulus (i.e., a change in external conditions) does not *cause* a process in an otherwise inert system; it only *modifies* processes in an autonomously active system" (p. 133 ff).

The living organism maintains a disequilibrium called the steady state of an open system, and thus it is able to dispense existing potentials or “tensions” in spontaneous activity or in response to releasing stimuli; it even advances toward higher order and organization. The robot model considers response to stimuli, reduction to tensions, re-establishment of an equilibrium disturbed by outside factors, adjustment to environment, and the like as the basic universal scheme of behavior. The robot model, however, only partly covers animal behavior and does not cover an essential portion of human behavior at all. The insight into the primary immanent activity of the psychophysical organism necessitates a basic reorientation that can be supported by any amount of biological, neurophysiological, behavioral,

psychological, and psychiatric evidence.

Autonomous activity is the most primitive form of behavior; it is found in brain function and in psychological processes. The discovery of activating systems in the brain stem has emphasized this fact. Natural behavior encompasses innumerable activities beyond the S-R scheme, from exploring, play, and rituals in animals to economic, intellectual, aesthetic, and religious pursuits to self-realization and creativity in man. Even rats seem to “look” for problems, and the healthy child and adult are going far beyond the reduction of tensions or gratification of needs in innumerable activities that cannot be reduced to primary or secondary drives. All such behavior is performed for its own sake, deriving gratification (“function pleasure,” after K. Buhler) from the performance itself.

For similar reasons complete relaxation of tensions, as in sensory deprivation experiments, is not an ideal state but is apt to produce insufferable anxiety, hallucinations, and other psychosislike symptoms. Prisoner’s psychosis, acerbation of symptoms in the closed ward, and retirement and weekend neuroses are related clinical conditions attesting that the psychophysical organism needs an amount of tension and activity for healthy existence. It appears that a proper distance between both understimulation and overstimulation should be maintained; the effects of the latter are called “culture shock” owing to the nervous overload in a

rapidly changing society.

It is a symptom of mental disease that spontaneity is impaired. The patient increasingly becomes an automaton or S-R machine, pushed by biological drives, obsessed by needs for food, elimination, sexual gratification, and so on. The model of the passive organism is a quite adequate description of the stereotype behavior of compulsives, of patients with brain lesions, and of the waning of autonomous activity in catatonia and related psychopathology. But by the same token this emphasizes that normal behavior is different.

## Homeostasis

Many psychophysiological regulations follow the principle of homeostasis. Its limitations' have been aptly summarized by Charlotte Bühler:

In the fundamental psychoanalytic model, there is only one basic tendency, that is toward need gratification or *tension reduction*. . . . Present-day biological theories emphasize the "spontaneity" of the organism's activity which is due to its built-in energy. The organism's autonomous functioning, its "drive to perform certain movements" is emphasized by Bertalanffy. . . . These concepts represent a *complete revision of the original homeostasis principle* which emphasized exclusively the tendency toward equilibrium.

In general, the homeostasis scheme is not applicable (1) to dynamic



regulations, that is, regulations not based upon fixed mechanisms but taking place within a system functioning as a whole (for example, regulative processes after brain lesions), (2) to spontaneous activities, (3) to processes whose goal is not reduction but building up of tensions, and (4) to processes of growth, development, creation, and the like. We may also say that homeostasis is inappropriate as an explanatory principle for those human activities that are nonutilitarian, that is, not serving the primary needs of self-preservation and survival and their secondary derivatives, as is the case with many cultural manifestations. The evolution of Greek sculpture, Renaissance painting, or German music had nothing to do with adjustment or survival because they are of symbolic rather than biological value (compare below). But even living nature is by no means merely utilitarian."

The principle of homeostasis has sometimes been inflated to a point where it becomes silly. The martyr's death at the stake is explained "by abnormal displacement" of his internal processes so that death is more "homeostating" than continuing existence; the mountain climber is supposed to risk his life because "losing valued social status may be more upsetting." Such examples show to what extremes some writers are willing to go in order to save a scheme that is rooted in economic- commercial philosophy and sets a premium on conformity and opportunism as ultimate values. It should not be forgotten that Cannon, eminent physiologist and thinker that he was, is innocuous of such distortions; he explicitly emphasized the "priceless

unessentials” beyond homeostasis.

The homeostasis model is applicable in psychopathology because nonhomeostatic functions, as a rule, decline in mental patients. Thus Karl Menninger was able to describe the progress of mental disease as a series of defense mechanisms, settling down at ever lower homeostatic levels until mere preservation of physiological life is left. Arieti’s concept of progressive teleological regression in schizophrenia is similar.

## Differentiation

“Differentiation is transformation from a more general and homogeneous to a more special and heterogeneous condition” (p. 19). “Wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation and hierarchic order.”

The principle of differentiation is ubiquitous in biology, the evolution and development of the nervous system, behavior, psychology, society, and culture. We owe to Werner the insight that mental functions generally progress from a syncretic state, where percepts, motivation, feeling, imagery, symbols, concepts, and so forth are an amorphous unity, toward an ever clearer distinction of these functions. In perception the primitive state seems to be one of synesthesia (traces of which are left in the human adult and

which may reappear in schizophrenia, mescaline, and LSD experience) out of which visual, auditory, tactual, chemical, and other experience are separated. In animal and a good deal of human behavior, there is a perceptual-emotive-motivational unity; perceived objects without emotional-motivational undertones are a late achievement of mature, civilized man. The origins of language are obscure; but insofar as we can form an idea, it seems that "holophrastic" (W. Humboldt) language and thought, that is, utterances and thoughts with a broad aura of associations, preceded separation of meanings and articulate speech. Similarly the categories of developed mental life, such as the distinction of "I" and objects, space, time, number, causality, and so forth, evolved from a perceptual-conceptual-motivational continuum represented by the "paleological" perception of infants, primitives, and schizophrenics. Myth was the prolific chaos from which language, magic, art, science, medicine, mores, morals, and religion were differentiated.

Thus "I" and "the world," "mind" and "matter," or Descartes's "*res cogitans*" and "*res externa*" are not a simple datum and primordial antithesis. They are the final outcome of a long process in biological evolution, mental development of the child, and cultural and linguistic history, wherein the perceiver is not simply a receptor of stimuli but in a very real sense *creates* his world. The story can be told in different ways, but there is general agreement that differentiation arose from an "undifferentiated absolute of self and environment". The animistic experience of the child and the primitive

(persisting still in Aristotelian philosophy), the “physiognomic” outlook, the experience of “we” and “Thou” (still much stronger in Oriental than in Western thinking), empathy, and so forth were steps on the way until Renaissance physics eventually “discovered inanimate nature.” “Things” and “self” emerge by a slow build-up of innumerable factors of gestalt dynamics, of learning processes, and of social, cultural, and linguistic determinants; the full distinction between “public objects” and “private self” is certainly not achieved without naming and language, that is, processes at the symbolic level; and perhaps this distinction presupposes a language of the Indo-Germanic type.

In psychopathology and especially schizophrenia all these primitive states may reappear by way of regression and in bizarre manifestations; bizarre because there are arbitrary combinations of archaic elements among themselves and with more sophisticated thought processes. on the other hand, the experience of the child, savage, and non-Westerner, though primitive, nevertheless forms an organized universe. This leads to the next group of concepts to be considered.

## Centralization and Related Concepts

“Organisms *are* not machines; but they can to a certain extent *become* machines, congeal into machines. Never completely, however; for a

thoroughly mechanized organism would be incapable of reacting to the incessantly changing conditions of the outside world" (pp. 17 ff.). The *principle of progressive mechanization* expresses the transition from undifferentiated wholeness to higher function, made possible by specialization and "division of labor"; this principle implies also loss of potentialities in the components and of regulability in the whole.

Mechanization frequently leads to establishment of *leading parts*, that is, components dominating the behavior of the system. Such centers may exert "trigger causality"; that is, in contradistinction to the principle, *causa aequat effectum*, a small change in a leading part may by way of *amplification mechanisms* cause large changes in the total system. In this way a *hierarchical order* of parts or processes may be established. These concepts hardly need comment except for one debated point.

In the brain as well as in mental function, centralization and hierarchical order are achieved by stratification, that is, by superimposition of higher "layers" that take the role of leading parts. Particulars and disputed points are beyond the present survey. However, one will agree that, in gross oversimplification, three major layers or evolutionary steps can be distinguished. These are the evolution of (1) the paleencephalon, "old brain" or brain stem, in lower vertebrates, (2) the neencephalon (cortex), evolving from reptiles to mammals, and (3) certain "highest" centers, especially the

motoric speech (Broca's) region and the large association areas that are found only in man. Concurrently there is an anterior shift of controlling centers, for example, in the apparatus of vision from the colliculi optici of the mesencephalon (lower vertebrates) to the corpora geniculata lateralia of the diencephalon (mammals) to the regio calcarina of the telencephalon (man).

In some way parallel is stratification in the mental system of personality. Again in extreme oversimplification, this may be circumscribed as the domain of instincts, drives, emotions, the primeval "depth personality"; that of conscious perception and voluntary action; and that of the specific activities characteristic of man, called "symbolic" in Western science, and the "secondary signal system" in Russian. Somewhat different is Arieti's intrapsychic organization of primary, secondary, and tertiary processes.

Thus it is clear that stratification exists both in the brain and in mental processes, and that these correspond in some way, but the particulars present great difficulties. The neurophysiological meaning of a small portion of neural processes (of the cortex jointly with the arousal system), being "conscious" while the majority is not, is completely unknown. The Freudian distinction of id, ego, and superego is certainly insufficient; especially so because the Freudian id (or unconscious) comprises only limited aspects, and disregarded its creative side, which was already emphasized by pre-Freudian authors. The "unconscious" is not only a cellar to put in what has been "repressed" but also

the fountainhead from which “creative” processes—in science, art, religion, presumably even evolution—arise. Unfortunately this is not widely known to American psychoanalysts; one may guess that the development of neo-Freudian thought and practice would have been different if the fact was recognized that the Freudian is but one version of the theory of the “unconscious.” Furthermore, the “unconscious” comprises both the lowest intrapsychic level (“primary process,” “animal drives,” “instinct,” and the like) and, paradoxically, the highest (variously named “oceanic feeling,” mystical, “peak” experience, Consciousness III, and so forth).

Thus stratification in its neurophysiological and psychological aspects is a fact, but it leaves many problems whose exploration would widely exceed the frame of the present article. In any case it is certainly incorrect when Anglo-Saxon authors refuse stratification for being “Philosophical” or insist that there is no fundamental difference between the behavior of a rat and that of man. Such an attitude simply ignores elementary zoological facts. Moreover, stratification is indispensable for understanding psychiatric disturbances.

Among the consequences of the stratified hierarchy of both the brain and mental function is a dismal one. It was expressed by the present author as follows:

Man is characterized by the massive development of the cerebral cortex

and the specific regions mentioned; while no comparable development is recognizable in the lower strata of his brain. (N.B., The hypothalamic regions are less highly differentiated in man than in lower mammals and monkeys.) This presumably is the reason why man's evolution is almost exclusively on the intellectual side. The ten billion neurons of the cortex made possible the progress from stone axes to airplanes and atomic bombs, and from primitive mythology to quantum theory. However, there is no corresponding development on the instinctual side. For this reason man's moral instincts have hardly improved over those of the chimpanzee.

Unfortunately this applies to all utopian hopes for man's betterment, from the preaching of the great religions to the Enlightenment's faith in reason to the nineteenth-century belief in progress and to Consciousness III. There is, quite simply, no anatomical substratum for the expected improvement.

This conception has been elaborated by Koestler and MacLean in the doctrine of the "three brains of man" to which we refer for detailed information on this important aspect.

## Regression

The psychotic state is sometimes said to be a "regression to older and more infantile forms of behavior." This is incorrect; already E. Bleuler noted that the child is not a little schizophrenic but a normally functioning, though primitive, being. "The schizophrenic will regress to, but not integrate at a lower level; he will remain disorganized" (p. 475). Regression is essentially



disintegration of personality, that is, dedifferentiation and decentralization. Dedifferentiation means that there is not a loss of meristic functions, but rather a reappearance of primitive states (syncretism, synesthesia, paleological thinking, and so forth). Decentralization is, in the extreme, functional dysencephalization in the schizophrenic. Splitting of personality, according to E. Bleuler, in milder form neurotic complexes (that is, psychological entities that assume dominance), disturbed ego function, weak ego, and so forth, similarly indicate loosening of the hierarchical mental organization.

## **Boundaries**

Any system as an entity that can be investigated in its own right must have boundaries, either spatial or dynamic. Strictly speaking, spatial boundaries exist only in naive observation, and all boundaries are ultimately dynamic. One cannot exactly draw the boundaries of an atom (with valences sticking out, as it were, to attract other atoms), of a stone (an aggregate of molecules and atoms that mostly consist of empty space, with particles in planetary distances), or of an organism (continually changing matter with environment).

In psychology the boundary of the ego is both fundamental and precarious. As already noted, it is slowly established in evolution and

development and is never completely fixed. It originates in proprioceptive experience and in the body image, but self-identity is not completely established before the “I”, “Thou”, and “it” are named. Psychopathology shows the paradox that the ego boundary is at once too fluid and too rigid. Syncretic perception, animistic feeling, delusions and hallucinations, and so on, make for insecurity of the ego boundary; but within his self-created universe the schizophrenic lives “in a shell,” much in the way animals live in the “soap bubbles” of their organization-bound worlds (von Uexkiill ). In contrast to the animal’s limited “ambient,” man is “open to the world” or has a “universe”; that is, his world widely transcends biological bondage and even the limitations of his senses. To him “encapsulation” (Boyce)—from the specialist to the neurotic, and, in the extreme, to the schizophrenic—sometimes is a pathogenic limitation of potentialities. These are based in man’s symbolic functions.

## Symbolic Activities

“Except for the immediate satisfaction of biological needs, man lives in a world not of things but of symbols.” We may also say that the various symbolic universes, material and nonmaterial, that distinguish human cultures from animal societies are part, and easily the most important part, of man’s behavior system. It can be justly questioned whether man is a rational animal; but he certainly is a symbol-creating and symbol-dominated being

throughout.

Symbolism is recognized as the unique criterion of man by biologists, physiologists of the Pavlovian school (“secondary signal system”), psychiatrists, and philosophers. It is not found even in leading textbooks of psychology and most recent behavioristic work in consequence of the predominant robot philosophy. But it is precisely because of symbolic functions that “motives in animals will not be an adequate model for motives in man” (p. 221) and that human personality is not finished at the age of three or so, as Freud’s instinct theory assumed.

The definition of symbolic activities will not be discussed here; the author has attempted to do so elsewhere. It suffices to say that probably all notions used to characterize human behavior are consequences or different aspects of symbolic activity. Culture or civilization; creative perception in contrast to passive perception (Murray, G. W. Allport), objectivation of both things outside and the self, ego-world unity, self-reflexiveness; abstract against concrete stratum; having a past and future, “time-binding,” anticipation of future; true (Aristotelian) purposiveness, intention as conscious planning; dread of death, suicide; will to meaning, interest as engaging in self-gratifying cultural activity, idealistic devotion to a (perhaps hopeless) cause, martyrdom; “forward trust of mature motivation”; selftranscendence; ego autonomy, conflict-free ego functions; “essential”

aggression; conscience, superego, ego ideal, values, morals, dissimulation, truth, and lying—these are very different formulations or aspects, but all stem from the root of creative symbolic universes and therefore cannot be reduced to biological drives, psychoanalytic instincts, reinforcement of gratifications, or other biological factors. The distinction between *biological values* and *specific human values* is that the first concern the maintenance of the individual and the survival of the species, the latter always concern a symbolic universe.

Consequently mental disturbances in man, as a rule, involve disturbances of symbolic functions. Kubie appears to be correct when, as a “new hypothesis” on neuroses, he distinguished “psychopathological processes which arise through the distorting impact of highly charged experiences at an early age” from those “consisting in the distortion of symbolic functions.” Frankl’s distinction of somatogenic, psychogenic, and noogenic neuroses should be generally accepted. Disturbances in schizophrenia also are essentially at the symbolic level and are able to take many different forms: loosening of associational structure, breakdown of the ego boundary, speech and thought disturbances, concretization of ideas, desymbolization, paleological thinking, and others. We refer to Arieti’s and Goldstein’s discussions.

The conclusion (which is by no means generally accepted) is that mental

illness is a *specifically human phenomenon*. Animals may behaviorally show (and for all we know by empathy experience) any number of perceptual, motoric, and mood disturbances, hallucinations, dreams, faulty reactions, and the like. Animals cannot have the disturbances of symbolic functions that are essential ingredients of mental disease. In animals there cannot be disturbance of ideas, delusions of grandeur or of persecution, etc., for the simple reason that there are no ideas to start with. Similarly “animal neurosis” is only a partial model of the clinical entity.

This is the ultimate reason why human behavior and psychology cannot be reduced to biologicistic notions like restoration of homeostatic equilibrium, conflict of biological drives, unsatisfactory mother-infant relationships, and the like. Another consequence is the culture dependence of mental illness both in symptomatology and epidemiology. To say that psychiatry has a physio-psycho-sociological framework is but another expression of the same fact.

For the same reason human striving is more than self-realization; it is directed toward objective goals and realization of values, which mean nothing else than symbolic entities that in a way become detached from their creators. Perhaps we may venture a definition. There may be conflict between biological drives and a symbolic value system; this is the situation of psychoneurosis. Or there may be conflict between symbolic universes, or loss

of value orientation and experience of meaninglessness in the individual; this is the situation when existential or “noogenic” neurosis arises. Similar considerations apply to “character disorders” like juvenile delinquency that, quite apart from their psychodynamics, stem from the breakdown or erosion of the value system. Among other things culture is an important psychohygienic factor.

## **The System Concept in Psychopathology**

Having gone through a primer of system-theoretical notions, we may summarize that these appear to provide a consistent framework for psychopathology.

Mental disease is essentially a disturbance of system functions of the psychophysical organism. For this reason isolated symptoms or syndromes do not define the disease entity. Look at some classical symptoms of schizophrenia. “Loosening of associational structure” (E. Bleuler) and unbridled chains of associations; quite similar examples are found in “purple” poetry and rhetoric. Auditory hallucinations; “voices” told Joan of Arc to liberate France. Piercing sensations; a great mystic like St. Teresa reported an identical experience. Fantastic world constructions; those of science surpass any schizophrenic’s. This is not to play on the theme “genius and madness”; but it is apt to show that not single criteria but integration makes for the

difference.

Psychiatric disturbances can be neatly defined in terms of system functions. In reference to *cognition*, the worlds of psychotics, as impressively described by writers of the phenomenological and existentialist schools, are “products of their brains.” But our normal world also is shaped by emotional, motivational, social, cultural, and linguistic factors, amalgamated with perception proper. Illusions and delusions, and hallucinations at least in dreams, are present in the healthy individual; the mechanisms of illusion even play an important role in constancy phenomena, without which a consistent world image would be impossible. The contrast between normality' and schizophrenia is not that normal perception is a plane mirror of reality “as is,” but that schizophrenia has subjective elements that run wild and that are disintegrated.

The same applies at the symbolic level. Scientific notions, such as the earth running with unimaginable speed through the universe or a solid body consisting mostly of empty space interlaced with tiny energy specks at astronomical distances, contradict all everyday experience and “common sense” and are more fantastic than the “world designs” of schizophrenics. Nevertheless, the scientific notions happen to be “true”; that is, they fit into an integrated scheme.

Similar considerations apply to *motivation*. The concept of spontaneity draws the borderline. Normal motivation implies autonomous activity, integration of behavior, plasticity in and adaptability to changing situations, free use of symbolic anticipation, decision, and so forth. This emphasizes the hierarchy of functions, especially the symbolic level superimposed upon the organismic. Hence besides the organismic principle of “spontaneous activity” the “humanistic” principle of “symbolic functions” must be basic in system-theoretical considerations.

Hence the answer whether an individual is mentally sound or not is ultimately determined by whether he has *an integrated universe consistent within the given cultural framework*. So far as we can see this criterion comprises all phenomena of psychopathology as compared with normality and leaves room for the culture dependence of mental norms. What may be consistent in one culture may be pathological in another, as cultural anthropologists have shown.

This concept has definite implications for psychotherapy. If the psychophysical organism is an active system, occupational and adjunctive therapies are an obvious consequence; evocation of creative potentialities will be more important than passive adjustment. If these concepts are correct, more important than “digging the past” will be insight into present conflicts, attempts at reintegration, and orientation toward goals and the future, that is,



symbolic anticipation. This, of course, is a paraphrase of recent trends in psychotherapy, which thus may be grounded in “personality as system.” If, finally, much of present neuroses are “existential,” resulting from the meaninglessness of life, then “logo-therapy” (Frankl), that is, therapy at the symbolic level, will be in place.

It therefore appears that—without falling into the trap of “nothing but” philosophy and disparaging other conceptions—a system theory of personality provides a sound basis for psychology and psychopathology.

## Conclusion

System theory in psychology and psychiatry is not a dramatic denouement or new discovery, and if the reader has a *deja vu* feeling, we shall not contradict him. On the other hand, it should be recognized that the “model of man” in systems terms is totally different from the still widely dominant “robot model” of neobehaviorism and other modern currents as enumerated in the beginning of the chapter. It was our intention to show that the system concept in this field is not speculation, is not an attempt to press facts into the strait jacket of a theory that happens to be in vogue, and has nothing to do with the “mentalist anthropomorphism” so feared by behaviorists. Nevertheless, the system concept is a radical reversal with respect to robot theories, leading to a more realistic (and incidentally more dignified) image of

man. Moreover, it entails far-reaching consequences for the scientific world view that can only be alluded to in the present outline:

1. The system concept provides a theoretical framework that is *psychophysically neutral*. Physical and physiological terms such as action potentials, chemical transmission at synapses, neural network, and the like are not applicable to mental phenomena, and even less can psychological notions be applied to physical phenomena. System terms and principles like those discussed can be applied to facts in either field.
2. The mind-body problem cannot be discussed here, and the author has to refer to other investigation. We can only summarize that the Cartesian dualism between matter and mind, objects outside and ego inside, brain and consciousness, and so forth is incorrect in the light both of direct phenomenological experience and of modern research in various fields; it is a conceptualization stemming from seventeenth-century physics that, even though still prevailing in modern debates, is obsolete. In the modern view science does not make metaphysical statements, whether of the materialistic, idealistic, or positivistic sense-data variety. It is a conceptual construct to reproduce limited aspects of experience in their formal structure. Theories of behavior and of psychology should be similar in their formal structure or isomorphic. Possibly systems concepts are the first beginning of such “common language” (compare Piaget and Bertalanffy). In the remote future this may lead to a “unified theory” from which eventually material and mental, conscious and unconscious aspects could be derived (L. Whyte).

3. Within the framework developed the problem of *free will or determinism* also receives a new and definite meaning. It is a pseudoproblem, resulting from confusion of different levels of experience and of epistemology and metaphysics. We *experience* ourselves as free, for the simple reason that the category of causality is not applied in direct or immediate experience. Causality is a category applied to bring order into objectivated experience that is reproduced in symbols. Within the latter we try to *explain* mental and behavioral phenomena as causally determined and can do so with increasing approximation by taking into account ever more factors of motivation, by refining conceptual models, and so forth. Will is not *determined*, but is *determinable*, particularly in the machinelike and average aspects of behavior, as motivation researchers and statisticians know. However, causality is not metaphysical necessity, but is one instrument to bring order into experience, and there are other “perspectives” of equal or superior standing.
  
4. Separate from the epistemological question is the moral and legal question of *responsibility*. Responsibility is always judged within a symbolic framework of values as accepted in a society under given circumstances. For example, the M’Naughten rules that excuse the offender if “he cannot tell right from wrong” actually mean that the criminal goes unpunished if his symbolic comprehension is obliterated and hence his behavior is determined only by “animal” drives. Killing is prohibited and is punished as murder within the symbolic framework of the ordinary state of society, but is commanded (and refusal of command is punished) in the

different value frame of war.

## Some Current System-Theoretical Issues in Psychiatry

It would be difficult to review briefly the numerous publications in “system-theoretical psychiatry. It may be useful, however, to enumerate a few major problem areas. Once more we refer to Grinker’s presentation in another volume of this *Handbook*.

1. The study of the intrapsychic self, that is, of the human psyche in its totality, is essentially a systems approach. So are Menninger’s vital balance and unitary concept of mental illness. In contrast to behavioristic and Freudian theories (the latter essentially are limited to the primary process), Arieti’s “types” or rather levels of cognition (primary as in the child, primitive, and schizophrenic; secondary in conceptual thinking; tertiary in creative processes) is a pioneering attempt toward a conceptual construction of the whole human psyche. Arieti’s persistent effort to introduce “cognition” into psychiatry (as he justly complains, “almost completely ignored by classical psychoanalysts”), corresponds with what has been discussed here under the label of symbolic activities. Combined with available insight into the evolution of the brain, this is perhaps as far as we may presently go. The task of the future (apart from further refinement) may be in establishing the isomorphism of the neurophysiological and mental aspects by means of a “psychophysically neutral” general system theory.

2. The problem of schizophrenia remains at present unsolved, and the enormous literature reflects a state of confusion. Recent investigators such as Grinker and Arieti (cf. also Bertalanffy) agree that it must be approached not in a monocausal way (for example, as a biochemical disturbance, as either genetic or environmental, as a result of psychodynamics, of double bind, and so forth), but in a system approach taking into account many interacting levels and factors.
3. According to what has been said above, learning theory in its conventional form, that is, based on classic or operant conditioning (positive/negative reinforcement), requires a thorough overhauling. It is not a model for animal behavior in the normal "wild" state as adaptive behavior is learned here without positive reinforcement and long-time repetition." It covers human learning in certain respects (so that teaching machines are well in place to a certain extent), but does not cover learning by "insight into meaning." At present no adequate theory covering the aspects mentioned appears to exist; but this is an urgent desideratum not only for theoretical psychology but also for psychiatry, in view of the involvement of learning processes in neurosis and psychosis, the application of behavior therapy and its limits, and so forth.
4. The systems approach appears to be particularly fruitful in family and group therapy and community psychiatry, where it has been widely used.
5. The same applies to "borderline" fields that in part are in the

domain of psychiatry and mental health service. Such are court psychiatry and juvenile delinquency; health service in general, which, in its present chaotic state and in view of the many “variables” involved, obviously requires a systems approach not only in the way of formal and learned programs but also in practical implementation; medical education and educational administration; functionalism in sociology, political science, and other fields.

6. The system approach is tacitly implied in a good deal of psychiatric practice. It has not produced a new wonder cure (fortunately one may say). But the two essential insights—(a) that mental illness and therapy are not mono- causal, but are processes in an enormously complex, interacting, multilevel whole; and (b) this whole or system essentially is not passive, robotlike, or an environment-dependent S-R machine, but is an active system, whose potentialities and activities should be employed both in normal life and in the therapeutic process—formulate a reorientation in psychiatry that is followed by many practitioners and finds a theoretical framework in system theory.
7. The above also partly answers a complex of questions that endanger the very existence of psychiatry as a medical specialty and that are epitomized in Szasz’s “myth of mental illness.” It is obvious that mental illness and psychiatry far transcend conventional science and the “medical model” because they are largely on the “symbolic” level about which (physicalistic) science tells us nothing. Furthermore, psychotherapy has far expanded into the sphere of problems

and conflicts that arise in a complex society and previously were handled by a nonmedical adviser, the wise friend, the teacher, the priest, and the like. This is apparent already in Roger's rebaptizing of patients as "clients," more recently in T-groups and allied forms of "psychotherapy" for the supposedly healthy. In anxiety, marital problems, and the psychological and behavioral abnormalities resulting therefrom, it is or may be extremely hard to say whether they are moral and value problems or constitute a medical case; consequently, whether relief should be sought in social (practically speaking, financial and social) help beyond the doctor's control, or else in pills, professional or nonprofessional psychotherapy, group therapy, and the like. There is hardly a doubt that the notion of "mental illness" has been blown up far beyond legitimate medical science and practice, for example, when considering alcoholism, drug addiction, and juvenile delinquency as "illness" rather than misbehavior beyond current social and legal rules. The question whether or not they are "psychiatric" remains most precarious as is shown by conflicting testimonies of respectable psychiatrists in any court case. Furthermore, there is something basically wrong with a specialty suffering from the "neuropsychiatric split" when the supposedly identical "illness" is treated either by brain surgery or by "soft talk"; comparable to warfare that combines napalm and intercontinental missiles with prayers and malediction of the enemy (as, paradoxically, is the case in our "enlightened" age). On the other hand, there obviously is "mental illness" as there is organic illness of various sorts, and it justifies the specialty of psychiatry in the same way as other specialties

of medicine are justified.

8. Possibly systems theory may play a unifying role in psychology. It is a major objection raised against psychology (and by implication, psychiatry) that it lacks consistent development and the cumulative nature that is characteristic of science. In any legitimate science results—empirical and theoretical—when once established, remain so and are accumulated in a continual evolution. Galileo or Mendel are still uncontested authorities, however much quantum mechanics and molecular genetics have transcended their discoveries. In psychology, in contrast, we seem to see kaleidoscopically changing fashions. It is an arena of contesting “schools,” theories convincing only to their author and his pupils, or limited to a particular professor, university department, or movement, and too many ephemeral and sensationalist fads.

This situation appears somewhat less hopeless from a system-theoretical view. Many seemingly different “systems” in psychology are descriptions of essentially the same facts in different “languages” as it were, or different aspects of such facts. To give an example, in developmental psychology we find the Piagetian, Wernerian, Brunnerian, and other “schools.” Analysis would show, however, that they are complementary rather than contradictory; that is, they present essentially similar models or paradigms in different languages (similarly as the same mathematical structure can be expressed in an equation or a graph, or the same physical facts can be expressed in the languages of classical thermodynamics and of



statistical mechanics). General system theory, because of its abstract nature, may be the best approach to a “common language” that unifies psychological theories and makes psychology into a science fulfilling the requirement of cumulation of established statements.

### **Humanistic General System Thinking**

In summary, we may, with Gray, emphasize that there exists a mechanistic and an organismic trend within systems theory. The first is understandably connected with technological developments such as control theory, cybernetics, system analysis in commerce and industry, and so forth. A systems (that is, multivariable) approach is obviously imperative to deal with the complex problems in modern society; it carries the danger of making the human individual ever more into a small wheel of the social “megamachine.” On the other hand, organismic-humanistic system theory is, according to Gray, characterized by what he calls the “five Bertalanffian principles,” namely, (1) the organismic systems or nonreductionist approach, emphasizing the wholeness of the organism and its accessibility to scientific method, contrasted with the elementaristic and summative approach of conventional science; (2) the principle of the active organism in contradistinction to the reactive organism, the robot or S-B scheme; (3) the emphasis on the specificities of human compared with animal psychology and behavior subsumed under the notion of symbolic activities; (4) the principle

of anamorphosis, that is, the trend toward higher order or organization in contrast to the entropic trend in ordinary physical processes, which is made possible by the open-system nature of the living organism and manifest in creativity and its manifold manifestations, ranging from evolution in its nonutilitarian aspects to behavior in play and exploratory activities and to the highest human creativity and culture; and (5) as a consequence of the latter, the introduction of specifically human and suprabiological values into the scientific world view.

There is obviously an inverse relationship between rigor and broadness of problems and answers. Problems of control theory or biophysics are amenable to answers in technical (mathematical) language, while human concerns can be discussed only in everyday language (although formalization is possible, for example, modern linguistic shows). But we would be amiss, especially in psychology and psychiatry, in disregarding fundamental “systems” properties and principles discussed in informal ways. In this sense the broad conception of “humanistic” system theory is or will be, we believe, indispensable in arriving at a broader understanding of man and the “human condition” than was provided by previous approaches.

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## Notes

- [1] The reader is referred to Grinker's article, "The Relevance of General Systems in Psychiatry" in Volume 6 of this *Handbook*. As is well known, Grinker's efforts in the field go back to conferences he started in 1951. The fact that the present contribution and that of Grinker were written in the same spirit, but independently, may lead to some overlapping, but hopefully also to further elucidation.
- [2] It would seem that no previous time need to learn lusty sex "from the book." The frescoes in Pompeii's *lupanar* were professional advertising rather than visual aids in sex education.
- [3] According to Skinner, "culture" "is a set of contingencies of reinforcement" (p. 182). This may well be true for American popular culture where an entertainer draws some \$30,000 for an evening, or a boxer a couple of millions. But how this statement may apply to a Mozart whose "reinforcement" mainly was getting tuberculosis and being seated at the lackey's table or, for that matter, to any creative person— including even university professors, who certainly would do better applying their IQs to the used car or other business—is no less wondrous to this writer than Mozart's work itself.