

A CYBERNETIC APPROACH TO FAMILY THERAPY

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The purpose of family therapy is this: release of fresh techniques for problem solving. In this paper, the family is conceptualized as a self-perpetuating organism with a built-in regulatory system. Family therapy is directed to altering the family's self-regulation so that it may evolve more efficient contact with its environment in terms of its purposes (Rosenbleuth *et al.*, 1943). Moving from this point of view, one can see that the family as an organism has an environment that includes other organizational levels, e.g., the family members, the broader society, and the town.

Critical intervention in any self-perpetuating (living) process is what I define as control. Control in this sense includes small interventions sensitively timed.

Information about the control of complex systems has been accumulating under the heading cybernetics (Ashby, 1961; Pask, 1961; Weiner, 1948). Cybernetics, the science of control, has precipitated from the necessity to cope with the explosion of change that is contagiously spreading in our time. This change infiltrates the very depths of our ecology. Cybernetics grew from the need to evolve brains (control systems) to manage the complex technological muscles (power systems) that can crush us out of existence. The constraints that slow the evolution of human skills at learning need to be disturbed, else we may not survive the misuse of our new muscles.

Our existing knowledge forces us to learn still more in order to maintain the stability we need. Learning is self-reinforcing. Like all living processes it pulses into change. But each generation must process this growth through its families' child-rearing constraints, whatever they may be. As has been discussed in previous papers (Brodey, 1959, 1963, 1964, 1965), families vary enormously in their capacity to metabolize information sensed from the environment and to produce informed decisions that may lead to continuously adaptive action. Thus, family therapy allows clinical observa-

tion of the process of evolving new control (self-regulatory) skills. The therapist must learn to be responsive to the family's control system if he hopes to intervene significantly. He must be able to conceptualize the family as a system that includes both its members and society in its environment. (We are not accustomed to this approach except when considering a member of the family in terms of his internal environment of component systems—vascular, nervous, etc.—in the same way we consider a family as made up of its members.)

The ability to be responsive and to change with change is the essence of stability (Ashby, 1961). Conceptualizing behavior in terms of systems that are coherent because they are bound together by a unified communication and decision system has the advantage of allowing one to consider the family in terms of movement style: to see it in relation to the adjustments it must make in order to maintain homeostasis while evolving new variation with which to meet the changing environment. There is a timing process here that can be specified as something more than art or intuition.

Adjusting the way we conceive of a family allows the creation of a notation that includes timing, though at first in a crude form. If we use a structuring framework that is built of time, as well as energy and information we can formalize more of our therapeutic art. "The tightening circle of a family tends to spiral tighter" —but this can be no more than a poetic expression until growth process is freed from the timelessly final cause-effect convention. Beginning, middle, and end is not a useful form when change must be defined. This ancient convention still prohibits the conceptualization of illness as growing of its own accord, in its own time and rhythm. That living systems produce change without germlike external causes is not spontaneous generation—it is growth. The contagion or chain reaction of a family process in which each effort to regain stability makes the situation worse is well known. The oscillation of crisis and inactivity has a timing that every clinician knows as being more than cause-effect.

Scientific psychiatry has been tied to an antique science of states that denies the modern science of relation. No one will argue that the man sick with tuberculosis is more susceptible to more tuberculosis or to any other disease. To say that neurosis causes neurosis will still seem unscientific to many people. But here we are conceptualizing a control system and not a final cause. When families become trapped in the accelerating process of reduced communication, finding out who started the withdrawal is irrelevant to designing useful intervention.

Disease grows disease; and for those who like the word "cause" (as I do not) disease causes disease. These words are often spoken with a shrug when misery gone wild accelerates itself. There is a time design to the interventions of an artistic therapist. He breaks into repetitive cycling, catching the family when its boredom is "off balance." When he is expected to be helpful, he may simply exaggerate the shrug.

But shrugs and glances and fists and gut feelings shared intuitively (by physiological and body language) are inadequate for building a recorded science of man. Even the crudest external quantitation in words promotes the development of theory and leads toward a more viable knowledge. But how can one specify the living complexity of which I speak? It does not chop into the traditional pieces—good and evil, light and dark, mature and immature, ego and id—or even into the straight-line metric scalings so long considered pure. The character of living systems is nonlinear.

Where are even crude words for the moment of happening—the "now" moments of the therapist's action, not culled by memory's abstraction and made into undetailed timeless generalization, or verbatim reports, or single variable graphs that leave out living and breathing? We need a theory of growing, of working-forward process, of the process of expanding into what was unknown to expectation.

The formal language of explaining is a way of rationalizing what is already past. Psychiatrists and priests have grown rich on this explaining what is past. Impact on the present does not depend on the truth of explanation.

Explaining is of less use with a lively family. It is of more use in analyzing a family that denies its present existence in favor of explaining its own past. The family therapist needs a language of now, of the on-going moment of learning, of contagion, of vicious cycles mixing to form stable and unstable moments. He needs a language that points out, and helps him to set forth easily, points of control where change is facilitated by a particular matching of behaviors; where a little information, gently repeated, swings the family bit by bit toward an oscillation that carried it beyond its rut. He needs a language that does not merely connect a man's relationship to average norms by straight lines depicting objective variance from what has always been expected.

But the language of real time is still shrugs and glances. Establishing a formal language that includes events as they occur in real time is a major problem of our epoch. With the bomb at our fingertips, we are forced to make control explicit; we cannot allow history to decide.

We are so committed to our customary language—the language we learned as we grew up—that we must look elsewhere for a base. Other disciplines have studied moment-to-moment control without being aware that the processes they worked on were relevant to our own human process. It was during the last war that we learned to program two guided missiles, each with its own electronic brain, so that they would try to evade or catch each other. Now we map this kind of control situation by designing two computer systems that work at learning to evolve each other's language. Gradually our instruments allow us to move from our concept of man as a simple energy machine to a consideration of him as a communicative machine, designed for control and operating in real time, which is never repeated. Man has always perceived himself as if he were an extension of his tools. For example, concepts of man's behavior as energy-bound (such as the libido theory) grew out of the steam-engine analogy.

Developing the capacity of two or more computers to learn to teach each other and to adapt to environments for which they were not specifically designed presents design problems analogous to those of raising children in an epoch when parents cannot predict the major environmental changes with which their children must cope. The days of apprenticeship, when learning consisted only of learning to repeat the performance of a previous generation, are past. Now children must learn from their parents control skills that will apply even in situations unthought of by those parents. The designers of a Mars probe have the same problem. A new awareness of the science of self-evolving systems is growing.

Response-ability is a feature of this kind of control. In "Some Family Operations and Schizophrenia" (Brodey, 1959), I have described the family that is unresponsive to the changing ecology of the individual and of the family unit. These family organisms grow their component parts so that they will fit with predetermined names, roles, and abstractions—with no responsiveness to individual or environmental growth that does not fit with expectation. This kind of a family has limited evolutionary power. It tends to break down. I have called it a closed-system family. The closed family is like an automated factory that is unresponsive to unexpected change. All the behavioral patterns are preprogrammed. This kind of assembly of parts is not suited to a time of rapid evolution. In this factory, dials or displays of performance are coupled directly to the levers that make the system go. There is no play. The system cannot change except in predetermined ways. It cannot evolve. It cannot resolve those divergent messages (double binds) that arise out of the need

to use what was formerly irrelevant as raw material for discovery and reorganizing growth.

The destructive growth process in a closed-system family is now one of the commonest points of agreement among family therapists. Out of contact, out of control, withdrawn—these concepts are well known. But the mechanisms of contact and being in control and being related have no formal language.

Can we who study the family describe this evolutionary growing—this growing in which each person discovers the other with increasing skill at finding the unexpected and discovering the unknown? Can we describe the creative process as it begins in the family, and thereby strengthen our knowledge of child's and man's behavioral evolution? This is the challenge our human situation presents to those who study family systems.

Can the family therapist help conceptualize the ways of learning and teaching without losing the richness of common clinical experience? For example, can we describe the phenomenology of tenderness? Tenderness is not simply mirroring or joining each other's movement or speaking in each other's rhythm; it is a responsiveness—a counterpoint—that acknowledges each other's time and content variation even as they are unexpected. Tenderness acknowledges the discovery natural to living process—the touch of fingertips responding to each other's touch. And words too may touch and grow into more than each one said. The responsive family is tenderly skillful in establishing the family as useful to its members in their mediations inside and outside the family unit.

We have new tools with which to explore the process of tenderness. The movie camera, the video tape recorder, the possibility of telemetering information about responsiveness in physiological state—all present new ways of examining explicitly what we have long known to be the simple facts of responsive life. We are finding new nonlinear units for measuring complex growth patterns. No longer do we need to limit our studies to written records as if the words themselves could stand alone without the body language.

But there is the constraint that we must unlearn. The science most clinicians know is imbedded in the matrix of Aristotelian classes of things and timeless truths (or falsities). It has no formal language or relations. It denies the advances of modern mathematics—even its present struggles. When we accept the old premises unwittingly, we are constrained. Then theory of the family becomes a medical theory—a caricature of sickness. Will we have the courage to turn to the problem of enhancing growth, rather than merely correcting its failures? Or will we leave excellence to the gods lest we aspire to the moon?

Cybernetics is just beginning the construction of a language for describing complex growth systems. To some it will seem strange that growth and changing can be made the content of scientific study. In the traditional past, our tools were designed to measure end points, thresholds, and bench marks. Acute and chronic have been the clinicians' formal words for specifying change. Our language was not rich in specifying kinds of change, except as rates. This kind of measure left us without a way of describing ongoing change except by speaking of the differences between two states and by retrospective explanations, which were then translated as if they were intended motivations. The continuing forward course of actually evolving behavior has long been dismissed as beyond our measuring skill, although its operational measure is well known to the skilled clinician.

Have clinicians been intimidated by the purveyors of obsolescent measuring systems into denying that their art can be approached by science? Or are the measurement designers intimidated by our unspoken need to preserve the therapeutic art as mystery? New skill at measuring control systems without denying their complexity is now becoming possible through developments in computer technology.

In the computer, we have a new tool that allows man a new metaphorical description of himself, one that includes ongoing adaptive and complex change. We have only to learn to ask new kinds of questions and to conceptualize interactive units less rigid than inches or seconds. The new equivalence relations include similar growth shapes. The new conceptions for measurement of biological systems are being spawned in that region of mathematics called topology. To progress in the new technological environment, we have only to learn to ask the new kind of questions. To use the computer's skill, we must be able to ask questions that are relevant to our artistic and intuitive action, to the clinical sense. The creativeness of the clinical artist is no longer being denied by a restrictive science; science is changing in the direction of enrichment as the art of creating has become a scientific concern.

LEARNING TO LEARN

But where is relevant information to be found? Fundamental questions about knowledge are induced when one examines the transmission of information in a family. Each family organism has its style of growing and creating itself over time. Some families differ from the "usual" family more than others. These are easier to describe. Variant families that develop unusual techniques of growing

are most important to behavioral evolution. What is grown in a particular generation is yet another issue.

As one begins to ask questions about growth process, one quickly becomes involved with whether children are being constrained in their growth by the restricted expectations that have been accepted as reality from generation to generation. Is present growth, then, a reflection of human growth potential, or do our observations reveal a commonly learned growth ritual? Most educational systems seem to operate like closed families and work to make the children fit with past roles (Bruner, 1962). It is hard to examine growth in this context. One does better to study the responsiveness of a family that is able to prosper in its growth.

Each family therapist who observes the whole family begins to be sensitive about the ways in which families teach their children to learn. There appears to be an enormous variation from family to family in these teachings. Observing the family forces the therapist to be aware that he too was taught to learn and was taught constraints that were breathed in with the knowledge from his parents' times. There is a recursive cycling of these constraints from generation to generation, as each teaches the next what to expect as human, and this somehow becomes an object of thoughtful study once one examines the family. That this kind of thinking should emerge at this time seems appropriate, for we now feel a special urgency to help our children to develop those skills which may insure their survival in a rapidly changing world.

Though the family therapist may not reach many people by the direct practice of his art, he makes available a new frame of reference from which to build toward a science of man as a control creature. Within this frame of reference, I have tried to make cybernetics something new. It is not just an attack on the past, or a re-naming to be translated within the matrix of old premises.

The family therapist knows the constraint systems used for preserving family repetitions that have long been obsolescent. As a clinician, he knows the problem of helping a family unlearn its obsolescent constraints. It is time now to locate the constraint in our knowledge and to begin the restructuring we need. The information transmission between the generations is now unstable—at a switching point. The need to enrich our language for describing behavioral evolution within the family as a precursor to education is evident. Description of the family as a system for evolving children who are more or less appropriately organized for survival can serve to assist us in designing education so that it can continue this early biological education more effectively. But where can we find a point at which our fundamental knowledge is open to change? Here one

approaches the problem of introducing change into the general body of knowledge. In science, one sees the same resilient use of knowledge to prevent structural change that one observes in families. As with the family, one chooses an area that has been relatively outside the conceptual frame of science, though obviously important. Timing, for example, is a territory in the scientific conceptualization of human behavior that is relatively neglected.

The timing features of a family system cannot be studied by adding up individual timings. A family, like any communicative net, must define a common time-language. This labeling system itself is relative: it moves in time. A family's timing may depend more or less on the impinging timing of its inputs at the moment. Each family has its characteristic clocking rhythms. What is defined as a moment is also a part of the family labeling system. For some families, the moment of necessity (e.g., necessary planning) is a year, and for others it is the shortest period of time that they know how to measure. The structure of the time-labeling system optimally reflects the control needs of the family. This system is more suitable for measurement than are families' opinions or explanations.

In some families, the time groupings used for decision-making ("It is the time now to decide . . .") are quite unresponsively set by what is publicly declared as the norm or average. These families, unlike others, are unable to change their timing so as to use event-packed crises sensitively and responsively in order to learn. They simply do not go into emergency mode and change the rules to accommodate to the changing tempo of a surge of happenings in the environment. For example, they do not meet the urgency or slowing of a suddenly organized adolescent with an altered developmental pace. The words and acts may be unchanged, but the action pace is unresponsive.

The expansion and contraction of usable control time during family crisis is intuitively no secret, but it has not been formalized. Well-timed crises freshen growth; therapists use the ebb and flow of critical instability. Formalizing this time process may give new understanding of growth and the growth of learning systems.

When, using the cybernetic point of view, one conceptualizes, one thinks of nonevolutionary systems as being self-limiting and artificial. As one uses these values, one begins to feel that it is exceedingly strange that we have for so long restricted the study of evolution to an examination of animal and plant species. In cybernetics, the conception of a self-organizing system includes within itself a teleology, or purpose, that is not defined in terms of its beginning. We are satisfied to consider a purpose as having no final

beginning or ultimate end. Purpose is the immediate realm maintained by the self-correcting and evolving feedback system.

The study and quantification of feedback systems is one aspect of cybernetics that has become popular. It is these mechanisms that determine and maintain stable cyclings, which then simply tend to recur as the organism becomes more and more entrained to this mode of regulation. Some kinds of rhythms are hard to break out of. For example, the control system of many families is set so that a child loses contact with the information flow in the family if his growth exceeds the speed or scope conventional to the family group. He loses contact and is slowed by the family's efforts to maintain its own features. To some extent this is necessary for communication. But maintaining identity requires changing so as to hold position in relation to the changing environment. This maintaining of identity tends to regulate a continuum over time in a way that has been called "natural." The former need for parents and children to be similar in their education did not afford recognition that potentials could exist at other equilibrium levels. Growth of the family may take astonishing spurts, given a new necessity. Feedback control is not readily described by analogy to nonliving systems. Though our basal metabolism can perhaps be described in terms of a coal furnace, our capacity to change, to learn, and to be educated does not readily fit this analogy.

A given family change need not be caused by some event of equal proportion or equal meaning. The ordinary energy analogue omits the control power of small changes at unstable points or switching points. As in the building intensity of love, it is a proposal at the right time—one movement responsively coupled with another—that builds the critical field necessary for creation.

Cybernetics describes many homely and complex aspects of living systems. For example, the particular control loops each have a time duration within which they can responsively encompass change. When too neatly balanced, some control systems develop wild, overbalancing oscillations. The evolution of a family from one form of stability to another is a particularly useful characteristic for a clinician to be able to discuss openly. In some closed families, the first awareness of small change is autocatalytic, for it brings with it the expectation that change will occur again. The therapist's task is to find a way to seed growth. The expectation that change will again occur serves to focus attention on this possibility and to cultivate readiness for change. The organism's expectation then accepts events that, though ever so slightly deviant, are similar in their very difference from that which was expected. Curiosity grows. Critical intervention allows some closed families to grope out into

the unknown bit by bit. This amplification is intensified as the system becomes less stable or when it is in process of transition; then intervention may dampen the process until skill in control grows further. When systems are unsettled or in process of decision, a small change that at other times would be irrelevant becomes a deciding factor. This gives power to what would otherwise have no way into the enclosure of our accepted natural reality. Often the question of the directions in which the organism will evolve is less important than the problem of its becoming sufficiently unstructured so that small change can be used to reestablish uncertainty. Only uncertainty can evolve the decisions that pattern a fresh family structure.

This process of behavioral evolution stands in contrast to the kind of direct coupling that occurs in symbiotic relationships where the freshening influence of the unknown or irrelevant or unexpected is denied. That growth suffers when this kind of control system is used has been previously reported. It is fortunate that our conception of human development and evolution is again becoming an open system. Family therapy provides an important route beyond what was dynamic in the first half of the century.

In conclusion, I must point to a question that arises for those who have become involved with family work. The new influx of observations has upset our tradition for theory, even to the extent that we must reexamine not only its content but its structure (McCulloch, 1965). We can deny the new information by renaming the old as if it were new or by renaming the new as if it were the old. But these common approaches to progress frustrate our growing awareness of the need for fresh dimensions. Even the most undogmatic thinkers are beginning to know the sense of obsolescence that comes quickly, without even the warning of a good fight.

Social science is in transition. Our augmented technology makes this evolution both necessary and possible. I am curious as to how the change will happen. Cybernetic theory serves as one source from which new concepts about the control of change are spreading. It is my prediction that the next stability will center around active augmentation of human learning skills rather than around prevention, health, or the overcoming of sickness. Study of the family prepares the way for this new growth. The evolution of augmented human control skill is necessary if we are to meet the challenge. The changing ecology requires new family skill at raising children who can enjoy the game of response and change because they have response-ability.

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