CYBERNETICS AND THE SYMBOLIC BODY MODEL

by William W. Everett

The human body plays a leading role in social and religious symbolism. Terms like Corpus Christi, body politic, corporation, body of knowledge, and *corpus juris* fill the speech of academics and laymen alike. Our perceptions of social and material reality are deeply affected by this metaphorical use of the word "body." Exhortation to the loftiest tasks of self-sacrifice or salvation appeal frequently to body symbols. Calls to civic action often depend on an analysis of the "cancerous growth" or "sickness" in the social body. Men are even willing to die for a body politic which is their Mother or Bride. A people's sense of the historical fittingness of acts can be greatly determined by the view that a society's history is the growth of a body to maturity and senescence. Similarly the human body can be used to depict the whole universe and cosmic history as an eternal or near-immortal body. The symbolic use of the body conditions much human thought and action. In this regard it is a basic component of ethical reflection and morally purposeful action. In this essay I shall develop the concept of the symbolic body model and indicate how cybernetics may affect its implications for contemporary society.[1]

I have spoken of the body as a symbol. By a symbol I mean a representation (usually an image), rich with associations and extrapolations, which is strongly tied to basic human purposes. Paul Tillich's notion of a "religious symbol" and Susanne Langer's idea of a "charged symbol" are very close to this view.[2] In Freudian terms, the symbol is an object of cathexis. It elicits deep and often prerational response and is therefore a primary aspect of human motivation. The body symbol has frequently been bound to the deepest kind of drive for self-perfection and survival. In religious contexts it plays a fundamental role in formulating and expressing the drive for salvation.

Symbols can undergo refinement and inner differentiation in order to make a precise impact on our more purposive actions and

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thought. They become models for us in rational life. A model is a means for depicting some unfamiliar process or object in terms of one that is familiar, usually by using the familiar one to draw out the basic structural properties of the other. A symbolic model is a symbol that has found modular elaboration. Some basic symbols, such as fire, water, or earth, have relatively limited rational refinement. The body symbol, however, has adopted and refined some of the most sophisticated models in human history. The progression from symbol to symbolic model usually demands the incorporation of other models from different contexts. Thus, the body symbol has drawn upon the machine, plants, lower organisms, architecture, and shipbuilding to gain full modular precision.

Once a symbolic model has become refined, it can slip from reference point to reference point. With regard to human organization, it can refer to a small group, a large organization, the nation, and humanity, not to mention the whole cosmos. In Buddhism and Christianity it has been applied to the religious community. Through this referential slippage it can direct human loyalties to many different areas. The sphere to which the symbol is attached becomes the center of value for the self. That referent now bears the hopes of that self for perfection, survival, and salvation. The referent of the symbolic body model becomes some kind of "pure," "subtle," or "mystical" body, to which one must adhere to overcome the fragilities of the individual self. The symbolic body model has thus functioned as a basis for evoking deep loyalty to social and cosmic "bodies" and has bound these rather inchoate loyalties to sophisticated schemes for defining human action and organization. The relation of "head" to "members" and the relations of the members to each other can be spelled out in considerable detail. Whether this social body refers to a specific organization or to a future transcendent body makes enormous differences for ethics and action.

Cybernetic Models

We have seen recently the emergence of yet a new symbolic body model which draws upon cybernetics for its rational elaboration. What is this cybernetic body model? What are some of its implications? Will it really gain importance in human affairs? In the next paragraphs I shall expose the cybernetic anthropology and sociology which is typified in the work of Karl Deutsch.

The cybernetic view of the body has emerged from the work of men such as Norbert Wiener, Karl Deutsch, Arturo Rosenblueth,

Anatol Rapoport, and W. R. Ashby, as well as the efforts in general systems theory pursued by Ludwig Bertalanffy, Kenneth Boulding, and others.[3] Wiener defined cybernetics as the study of "communication and control in animals and machines." Cybernetics maintains that control is ultimately a matter of communication. Moreover, this communication can be understood in such a way—namely, mathematically— that the same rules pertaining to machines can also apply to men, whether they be individuals or organizations. At first blush we seem to have returned to the world of mechanics as the model for understanding. Mechanical procedures are used to describe the transfer of patterns of information. However, through immense complexification of this mechanical interaction, phenomena emerge which hitherto could only be explained in terms of "spirit" or "organism." How is this so?

The basic unit of communication is a "bit" of information conveying the signal "yes" or "no" (i.e., "on" or "off"). With enough yes-no indicators one can detect grades of intensity as well as handle mathematical problems. The machine of yes-no devices thus processes incoming signals in accordance with certain preconditions in its program. We have now reached the point in computer research that even these conditions can be changed with regard to more general "purposes" present in the program at a higher level. By extrapolating this property of computers we come to an explanation of mind itself.

Every discrete aspect of information processing, or "mind," is thoroughly rational, quantifiable, and calculable. There are no wispy spirits or transcendent incursions involved. All novelty, purposefulness, and memory are a matter of complexification of the basic units of operation. Thus, it is claimed that we have a thoroughly rational theory of mind without sacrificing explanation of matters hitherto relegated to mystery.

Hence, the self appears under two aspects. On the one hand, it is totally mind, in the sense that it is an elaborate system of communication. The self is fundamentally a particular form of organization of information—from its genes and chromosomes to its cerebrum. On the other hand, it is entirely body, or material. All information processing is the operation of complex material mechanisms. We thus have a comprehensive model for the bodily self.

This self is characterized by homeostatic mechanisms, memory, and hierarchy. It is a system of interlocking structures which preserves its unity by tending toward some kind of equilibrium or homeostasis. It tries to achieve some kind of balance between de-

mands from the outside environment and demands from the inside environment. If it exceeds certain critical margins, it will destroy itself. Achieving this equilibrium is not only the simple matter of obtaining food, water, warmth, and safety. The complex processes of the mind also spin out very general purposes and values according to which action is determined. In some cases to forsake these deeply held purposes, even at the risk of other deprivations, is a mortal threat to the balance of the self. These values need not arise out of the peculiar operations of each self. They may be the product of the public mind, whose processes span many centuries. Therefore, we cannot really say cybernetics is "materialistic," for it deals with the transfer of *patterns* of information. These patterns are desired states described as principles of arrangement, which in themselves are quite ephemeral indeed.

The purposive activity of the self can be explained in terms of the survival necessity of adjusting to internal and external environments as well as to the established values of the self's information-processing mechanisms. What we call purpose is the action of tending toward a given state of equilibrium among the many forces constituting the self. These margins of survival, of course, will differ from self to self and culture to culture. Detection of the gap between actual behavior and these margins occurs through feedback mechanisms which monitor the effects of actions. Since feedback has become a very popular concept, I shall not develop it here. It must be noted, however, that it refers to the monitoring of both the internal and external conditions of the body system and of the impact made on those conditions by the self.

If the mind is fundamentally an enormously complex computer, then its primary characteristic is memory. The mind is a process of memory. It not only recalls information from feedback sources but also contains the established goals, purposes, and values according to which the self selects various alternatives presented by the environment. The memory breaks down complex inputs into their separate components and then can imagine a great variety of possible novel recombinations of these units. Thus arise proposals for new kinds of actions, responses, and goals. Memory is not a graveyard of the past but a process of assembly—a beehive of continuously interacting information units.

Finally, the processing of information is a hierarchical process. The homeostatic demands of the self require decisions among alternative courses of action. The self is a decision center. Decisions can be made only with regard to some hierarchical criterion of

importance. Not only are the various values and goals hierarchically arranged, so are the very structures of feedback. Some signals can be processed at very simple levels, such as instinctive blinking or subconscious reactions to stimuli. Others must reach higher levels to receive adequate treatment. There is a relative decentralization of mind according to the character of recurring needs, variety of possible actions open to the self, and simplicity of response necessary. In every case, the mind is hierarchical because it is a means for deciding upon responses to environmental conditions.

In all three of these aspects mind emerges here as not a receiver and transmitter of some static images, which are then conveyed to the "lower members," as in the classical Platonic view of the relation of mind to body. But mind is merely the activity of the body as it responds to changing environments. Any generalized images of God or the cosmos are the results of the complexification of human mind in making these responses.

The self and human culture generally are therefore complex constructions. Any mysteries, spirit, and nonempirical realities they contain are sheerly the result of immense complexification. Such a view is quite congenial with the modern scientific temper but clashes harshly with traditional realistic philosophies. The dispute does not involve the rejection or acceptance of certain experience (especially religious), but the means for interpreting them. Some cybernetic theories, such as Karl Deutsch's, contain an ethical methodology similar to that of natural law theories. They move from a statement of actual tendencies, such as the drive for dignified survival, to a set of prescriptions for behavior, such as openness, flexibility, adaptation.

Cybernetic approaches, sketched here only broadly, are already influential in theories of cognitive development, neurology, anthropology, and certain forms of psychotherapy.[4] But what are their implications for the use of the symbolic body model in human affairs, especially at the societal level? Let us deal with these implications in two stages: first, those which are unequivocal and, second, those which are equivocal and ambivalent.

Unequivocal Implications for Human Affairs

Certainly, a cybernetic model locates the sources of control in the information centers of an organization or society. Even with regard to American society, we see that the locations of power in data banks, files, and intelligence agencies require new interpretations of the Constitution and Bill of Rights. Power in a highly cybernated

society assumes forms unknown to the Founding Fathers. A cybernetic model helps us understand the actual configuration of power in the society.

Second, this kind of power is implicitly public because it is rational and quantifiable. Its secrecy is only a policy decision. The power of information does not arise from an arbitrary will of persons or their strength, but from the capacity of information to reveal to us the objective conditions under which we must operate in order to achieve goals. Arbitrary action only leads to lack of coordination and powerlessness over complex environments.

Third, a cybernetic model emphasizes the necessity for clear separation between the functions of feedback and those of execution. If the hierarchy of monitoring and that of execution are confused, then the whole system loses accurate control over its effects. It becomes ignorant of what it is doing or loses sense of its goals by adapting execution orders merely to accord with previous responses. In the case of American government this implies an organizational expansion in the legislative sphere to monitor the activities of the executive branch. The idea that Congress should only legislate is a precybernetic conception of governance. Similar changes have already occurred in industry with the rise of elaborate hierarchies of quality control.

Separation of channels is just one way an information system overcomes entropy, that is, the deterioration of messages. Cybernetics leads us to improve social communication in an effort to overcome damaging conflicts. However, such increased clarity may actually sharpen conflicts in the short run by bringing groups to self-consciousness about their own interests. Moreover, truly rational decision making in a cybernetic scheme requires that all messages be translated into one quantifiable spectrum in order to weigh one against the other. But how are subjectively oriented demands to be compared? Cybernetics can direct us to calculations of the consequences of various alternatives, usually in terms of money cost, but this has great limitations for policy making. However, the goal of rational decision making is held out to us. Whether the world and human affairs are ultimately rational is an eschatological and theological question.

Finally, cybernetics emphasizes the organizational aspects of any large or complex grouping. Human affairs are to be understood in terms of the problems of adapting societal systems to environments. This requires policy decisions based on adequate information, clear goals, and effective execution. Of secondary analytic importance

is legitimation of accommodation to a plurality of conflicting, fairly independent groups within the social arena. Survival demands tighter coordination. In times of acute social sensitivity to survival needs we would expect increased rhetorical use of symbolic body models. This would also be true of the cybernetic body model, with the proviso that "unity" demands a fairly free circulation of objective information about the environment. Moreover, these messages must not be contaminated by preexisting decisions. In broader respects, however, the cybernetic model falls in the tradition of organic social theory, which emphasizes the needs of the total social system, rather than nominalistic or conflict theories, which emphasize the needs of persons or small groups. This is only another indication of the basic compatibility between the cybernetic model and other symbolic body models.

One can still question whether a jaundiced view of the gaps and conflicts among participating groups in a society is really bound to the cybernetic body model. Could it not be that the cybernetic system does not refer to the overall society but to the conflicting groups within it? Yes, of course, though if the small groups were tightly organized, the society would be seen as an open arena or theater of history. With this observation we can move to the second stage of implications, in which our choice of referent makes a great difference to our description and ethical prescription.

Ambivalent Implications for Human Affairs

The capacity to slip from one to another among various referents makes it possible for a symbolic model to be powerful in human affairs, for it can transfer loyalities from smaller and more familiar groupings to much more impersonal, distant, and comprehensive realities. According to the reference point taken, the cybernetic model can justify either bureaucratic or libertarian theories of society—the former featuring tight coordination and clear definition of information channels, the latter exposing the loose relations among independent groupings within a social order.

If the primary referent is persons or small groups, then wider social systems must undergo a mutual accomodation with them to accord them liberty. The larger society would be seen merely as an environment with its own, sometimes opposed, interests. One could infer from the cybernetic model that accommodation might mean merely the complete victory of the stronger body. In that case the cybernetic model would be only an analytical device for understanding that conquest. However, inasmuch as the cybernetic sym-

bolic model becomes a bearer of hopes and expectations normally surrounding the perfection and survival of the body, it gains normative power and direction. In that case each body has a right to survive and, in Karl Deutsch's view, to survive with "dignity." This means that bodies should reach positions of mutual accommodation. If they cannot do this, then more expansive systems will arise to adjudicate these disputes and enforce judgments. The possibility of such a pluralistic and libertarian society depends finally on the rationality and essential good will of the disputants, as well as the possibility of rational and mutually enhancing (or at least not mutually destructive) solutions to these conflicts. This seems like an impossible possibility in human affairs. The continual extrapolation of the prime body to ever more expansive levels seems inevitable.

On the other hand, by the very same measure, if the primary referent is the larger society, then the perfection of that social body requires the subordination of its parts for the sake of surviving in the face of the environment. It is important to note, however, that a cybernetic model can be found only with difficulty to legitimate the kind of totalitarian or managed society often associated with body models, beginning with Plato. From a cybernetic perspective there are tendencies for decentralization in the very apparatus of execution and decision making. Without delegation of tasks the central information networks become clogged with trivial messages. In some cases this delegation can lead to the relative autonomy of these subordinate centers. In this case cybernetics suggests that undistorted information transfer is enhanced in societies when the various information centers are related voluntarily. If they do not have appropriate degrees of autonomy, clear messaging tends to be replaced by polemics and propaganda.[5]

However, it is also important to remember that feedback hierarchies have to report about objective conditions, especially those arising from the authorized actions of the system. Demands and desires of groupings outside this purview may go unheeded. In either case, even the most pronounced subordinationism would take care not to damage the functional capacities of the members. The tendency of most symbolic body models, as I have indicated, is to equate forcefully the welfare of selves with fulfillment of the functional needs of the more comprehensive system. It is not yet clear whether the cybernetic model will also be used in that way, despite Deutsch's use of it to endorse decentralization and a wider range of liberties.

We have already seen that a key characteristic of the symbolic

body model is the way it expresses the drive for perfection of the self, that is, for ultimate survival. This feature is quite compatible with an essential aspect of cybernetic analysis, namely, the assumption that systems seek survival through accommodation with an environment. Their whole constitution is oriented toward making and executing decisions to achieve objectives within these margins. The prominence of this notion is another way in which the cybernetic model is a compatible modular refinement of the body symbol bearing these survival hopes. However, we then must ask, who or what is going to survive?

In the cybernetic model itself we see several possible answers. In the short run the whole structure of the system is to survive. But this can be altered in accord with the functional needs of the system. Finally, even these functional needs can be redefined in accord with the highest goal of survival itself. "What" survives, then, is sheerly the action of being autonomous and self-directing. To survive means to be in some sense self-controlling. In cybernetics this means to maintain the operation of information processing—in short, of minding. Body, that is, material structure, is taken up into mind, that is, the process of being autonomous.

Thus, we see the extrapolation of ever less tangible goals into the distant future. The idea of survival, which may have started with the simple need for food, has been perfected into a comprehensive and abstract value. This value, lying in the farthest future, can now return into the present as an ultimate value, that of minding and control. When translated into the referent, "society," it means that the central control and communication apparatus has rightful precedence over the simpler, less comprehensive ones. Moreover, just as this minding is the final survival good of the self in temporal extension, so this social minding becomes the good of the self in the immediate present.

In this extrapolation of the referential slippage of the body model under the impact of the self 's drive for survival, we see two referential dimensions appear—those of time and of space. The symbolic body model produces ethical implications by being transposed into more expansive realms of time and space, thus creating a condition of subordination of the self to the projected pure self, whose survival is taken to be the precondition for perfection and survival. This is how the symbolic Model has always been a helpful companion to any naturalistic or natural law ethics. It enables us to translate the "is" of the body image into the "ought" of obedience to more com-

prehensive systems of action. Cybernetics, rooted fundamentally in descriptive science, becomes a model for normative reasoning in public affairs by being incorporated into the body symbol.

Since the cybernetic model accords so well with some of the perennial implications of the body symbol, it is highly likely that it will gain wide use as the contemporary dominant symbolic model. It will receive increasing employment in political discourse, where speakers seek to elicit specific actions from persons. It may also gain use in theories of the church, where it might offer a modern reinterpretation of the exact structural significance of the idea of the church as the Body of Christ.[6] Finally, it will be used extensively within bureaucratic organizations that are seeking to enlist a wider range of strong loyalties from functionaries within the organization.

With this observation we must ask more forcefully, Do all symbolic body models, including the cybernetic one, inevitably fasten upon the most comprehensive social structure, with the implication that they will lead us to make of all mankind a vast cybernetic organization? (Note that "man" is also a body symbol.) Does this tendency always imply a fundamentally antilibertarian theory of society? Not necessarily. Like Hegelian philosophy, cybernetic body models can receive both right-wing and left-wing interpretations. Once again, this interpretation depends on the specific referential scheme. It is possible to extend the primary referent for the human body beyond mankind or even the cosmos. In terms of symbolic perfection and refinement this is quite a logical step. If this ultimate pure body is transcendent, then it can stand in judgment over any of the purported pure bodies of human societies and organizations. In that case comprehensive organizations inferior to the cosmos could claim only relative and tentative superiority at best. The question would then arise, Are the larger societies irrelevant as intermediaries between the self and this ultimate body? How similar this is to the Reformation critique of the medieval church!

The logic of survival projection would lead us to say that the more comprehensive societies are not irrelevant, for they make possible intermediate periods of survival, whether in securing necessities for us or in guaranteeing the preservation of our accomplishments in the cultural memory. In fact, one could criticize them only if they were not encouraging the survival of selves. Even if particular institutions were murderous, however, others of comparable kind could always claim to be the rightful heirs of their legitimate functions. The jails could always be replaced by "hospitals." In short, the

shifting of references could never justify true anarchism, but could always justify at least a tentative legitimation of increasingly comprehensive social structures.

Conclusion

In these respects we might say that the symbolic body model is one basis for rational sociality. By attaching human loyalties to larger spheres of action, it binds men in common life. By its modular precision it enables them to form rather precise expectations of one another. By its capacity to change reference points it maintains a certain judgment on any tightly conceived patterns of domination and obedience.

Cybernetics constitutes a formidable modular development of the body symbol because of its rather comprehensive scope of explantation, including in its range selves, machines, and societies. It bridges the old dichotomies between mechanistic and organismic philosophies with the embracing category of communication. At the ethical level it contains some features which militate against its use purely as a justification for bureaucratic totalitarianism, as some might expect of it. Finally, it is a conceptual scheme oriented not only to description but to employment for the sake of acting upon the world. Therefore, it parallels nicely the translation of "is" into "ought" within the body symbol itself.

The symbolic body model appears as a powerful vehicle for translating scientific and other kinds of models into social theories. By being incorporated into the body symbol, with its compelling appeal to desires for self-perfection and salvation, these models become effective means for channeling human activity. The fact that these symbolic models have diverse implications for social policy (in this case both libertarian and bureaucratic) only attests to their broad dominance in orienting men in social affairs.

Finally, the exploration of the symbolic body model is one way to trace the possible impact of development in one area, such as technology or science, on society and public policy. In that sense, this essay has been an effort at prediction and prophecy, as well as at understanding the way men think about society.

NOTES

1. I have developed the ideas presented here more expansively in my doctoral dissertation, "Body Thinking in Ecclesiology and Cybernetics" (Harvard University, 1970).

2. Paul Tillich, "The Religious Symbol," trans. J. L. Adams, *Journal of Liberal Religion* 2 (1940): 13–14; Susanne Langer, *Philosophy in a New Key* (New York: New American Library, 1951), p. 239.

3. Karl Deutsch's *The Nerves of Government* (New York: Free Press, 1966) presents the furthest-ranging exploration of the implications of cybernetics for political science. I have drawn on his work extensively in formulating my own position. See also Norbert Wiener's *Cybernetics,* 2d ed. (Cambridge, Mass.: M.I.T. Press, 1965), and *The Human Use of Human Beings: Cybernetics and Society,* 2d rev. ed. (Garden City, N.Y.: Doubleday & Co., 1954). For Ludwig Bertalanffy, see his *Robots, Men, and Minds* (New York: George Braziller, Inc., 1967) as well as the journal *General Systems.* For Kenneth Boulding, see *The Organizational Revolution* (Chicago: Quadarangle Books, 1968).

4. I have in mind the work of John Dollard and Jerome Bruner in psychology, Warren McCullough in neurology, and Claude Lévi-Strauss in anthropology. Cybernetics has even appeared as the basis for self-help psychotherapy of the positive-thinking variety in Maxwell Maltz, *Psycho-cybernetics* (New York: Essandess Special Editions, 1967).

5. Deutsch has had a long-time interest in political confederation and decentralization. For a recent statement, see Manfred Kochen and Karl W. Deutsch, "Toward a Rational Theory of Decentralization: Some Implications of a Mathematical Approach," *American Political Science Review* 63 (1969): 734–49.

6. For examples see Mary Virginia Orna, *Cybernetics, Society and the Church* (Dayton, Ohio: Pflaum Press, 1969); and Peter F. Rudge, *Ministry and Management* (London: Tavistock Publications, 1968).