

SOCIOLOGICAL IMPLICATIONS IN THE THOUGHT OF TEILHARD DE CHARDIN

by Mihaly Csikszentmihalyi

In the ten years since Pierre Teilhard de Chardin's *Phenomenon of Man* first appeared in English, the thought of the French paleontologist has attracted widespread attention and produced an uncommon degree of controversy. Teilhard's evolutionary theories have found receptive audiences in the most unlikely places, from Marxist theoreticians in Moscow to Leopold Senghor in Senegal and to the Mountain Survival School in Black Hawk, Colorado; and, as is to be expected, most followers seem to have accepted their message in a rather uncritical way. The controversy has achieved a sharper focus in two distinct circles: the Catholic theological community, and among those few scientists who take the trouble to involve themselves in the discussion of such broadly general theories as Teilhard's are.

The problems Teilhard encountered within his own church are too well known to even mention here; in the last few years, however, it has been orthodox Catholics who have contributed most to the analysis of his thought.¹ While most Catholics seem to believe that it is possible and valuable to reconcile Teilhard's conceptions with the traditional Christian world view, some still balk at what they consider his radical reinterpretations of the nature of God, the process of creation, and the nature of sin. The scientific community is equally divided, but the proportions are roughly reversed: few scientists admit any value to Teilhard's notions, although some outstanding scientists like biologist Julian Huxley and geneticist Theodosius Dobzhansky have not dismissed his ideas out of hand.² Most scientists, however, have followed the lead provided by Peter Medawar, the Nobel Prize-winning virologist, whose virulent review of *The Phenomenon of Man*³ set the tone for an almost general ostracism of the French Jesuit in scientific circles. When about eight years ago I asked one of my genetics teachers in graduate school what he thought of Teilhard, the answer was that the man was a charlatan to be forgotten as soon as possible; this I found later to be a fairly typical reaction.

Mihaly Csikszentmihalyi is associate professor of sociology and anthropology, Lake Forest College, Lake Forest, Illinois. As of July 1970, he has been appointed associate professor of human development, University of Chicago.

While most of the scientific arguments about the merits of Teilhard's work have revolved around his positions on evolution and genetics, little attention has been paid to the sociological applications of his ideas, and then almost exclusively in the Catholic literature.⁴ This is not surprising, since Teilhard did not claim any competence in the social sciences, nor is the subject at all developed in his work. Yet if one reads his books attentively, one becomes aware of some extremely stimulating sociological questions implicitly stated in the broader context of his work. Therefore it might be useful to develop the social aspects of Teilhard's thesis, remembering that contemporary sociology has been deeply influenced by the thought of men whose sociological understanding was not only rather naïve, but who were even adverse to the use of sociological explanations: Marx, Freud, Husserl, and Piaget are a few names that come immediately to mind.

It is almost certain that what has precluded social scientists from seriously considering Teilhard's work is the bad reputation that the latter has acquired among natural scientists. If Teilhard's basic statements about the evolutionary process are wrong or unscientific, then what could we possibly gain from a painstaking development of his much less obvious sociological contributions? And if his natural science is invalid, how can his social science be useful, given that the second is based on the first? The only way to answer this perfectly legitimate question is that whatever contribution Teilhard might bring to the social sciences, it is not going to be a "scientific" one in the strict sense; it is more a heuristic apport, or the kind of "metaphysical" reorientation that even such a hardheaded positivist as Popper recognizes as having a vital role in science.⁵ In fact one really does not need to apologize at all for the lack of firm scientific grounding in Teilhard's theory. As we shall see later, one of the suggestions of his work is precisely that as far as *social* science is concerned, metaphysics and science are related in a dialectic symbiosis that cannot be separated without missing the point of social reality. In other words, what in one generation is metaphysical speculation disguised as science, in the next generation might become the social reality to which the scientific method can legitimately be applied. The putative "objective laws of society," whether they are postulated by Marx or Parsons, act as self-fulfilling prophecies which help to determine the actual social relations of the community that has accepted their truth.⁶ We shall consider this controversial idea in more detail later; but before we begin to unravel Teilhard's ideas in earnest, it behooves us to state the limitations of this analysis.

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In the first place, it should be clear that since Teilhard has not clearly developed his sociological theses, this attempt to develop them is highly subjective, and might not correspond to what others might "read" into his thought. What I have tried to do was to start with some of his basic postulates and work deductively to form conclusions that are applicable to present concerns in the social sciences. In doing so I might have projected some of my own thinking in Teilhard's, and if so I shall assume responsibility for it; but I submit that inasmuch as the logical links connecting the postulates to the conclusions are valid, the latter are indeed contained in the system that Teilhard has attempted to create. Second, the system here reviewed is the one outlined in *The Phenomenon of Man*, which is probably the most self-contained expression of Teilhard's lifelong work, and no attempt will be made to use material included in other sources. Third, I will not try to consider every aspect of his system, nor even to deal with some of its most basic components: the point is not to assess the system in its entirety, but only to examine those aspects of it that might be relevant to the present concerns of the social sciences.⁷ And, finally, there will be no attempt made to use any of the religious, teleological, or generally eschatological aspects of Teilhard's thought. Although these aspects are indispensable to the understanding of Teilhard as a person, I do not believe they are as necessary to his theory as it is commonly held. With these preliminary considerations out of the way, we shall now proceed to the substantive part of the analysis.

DO NATURAL LAWS GOVERN SOCIAL HISTORY?

One of the most persistent problems in all social sciences concerns the very grounds of its activity: Is social reality continuous with physical reality, are laws of human behavior qualitatively identical with natural laws, and, therefore, should the social scientist model his approach on those of the natural scientist? Everyone is aware that if these questions have been often raised in the last hundred years, they have never been asked with the insistence and the intensity with which they are being asked now.⁸ It is thus appropriate to begin by considering what Teilhard's system contributes to the answer of this most urgent question.

"Man," runs one of Teilhard's most vivid definitions, "is nothing else than evolution become conscious of itself."⁹ The consequences of this way of looking at man are far-reaching. If indeed, as it is self-evident, man is just part of the process of changing and evolving matter, *but is a part that has become conscious of the process of change*, then the study of man and his actions must take this fact into account.

"Nature" changes according to laws that are constant over long-range periods, and there is no feedback from physical systems to the laws that rule them, because physical systems are unaware of these laws or of any alternative to them. Man, on the other hand, having slowly developed the concept of freedom, is able to posit alternative courses of action and thus escape, even if only occasionally and at the price of great efforts of imagination and of will, the strict determinism of previously existing conditions. The above statement is, at the metaphysical level, fraught with explosive controversy. Philosophers and scientists alike will denounce it as a return to a discredited faith in free will. But this can be done only by invoking metaphysical arguments, since empirically it is clear that most of us act most of the time *as if* we had a free will, and we make choices accordingly, thereby changing the complexion of the future in a myriad of unpredictable ways. Empiricists who are aware of what they are doing know, as Popper does, that the law of universal causation is a metaphysical assumption rather than a "scientific fact."¹⁰

But Teilhard is not trying to evade the law of causation: he simply brings into focus the qualitative difference in the way causation works—at least potentially—in the human realm. Politics, art, science itself are possible only because of the implicit assumption that man must project previously nonexistent models into the future, and thereby change a relevant aspect of reality. The whole point of Popper's *The Poverty of Historicism* is that social reality changes as a function of the increase in human knowledge: but this fact leads him to a diametrically opposite conclusion from Teilhard's. According to Popper, long-range laws of human development and social change cannot be established because as knowledge increases, the laws and forms of social interaction will be changed to suit the new knowledge.¹¹ And since the content of new knowledge is by definition unpredictable, laws of social change are equally impossible to establish in advance. Thus Popper concludes that the realistic and proper task of social scientists is to understand the laws of social life operating at any given time, and on the basis of this knowledge to help eliminate those factors of social life which at any given time the majority of people (or some unspecified representative segment thereof) consider most nefarious—factors such as overpopulation, atomic armaments, and ecological pollution are in our day. By no means, Popper contends, should the social scientist attempt to hold on either to a utopian idea of society or to a belief in an unchanging law of social development: to do so would only stifle progress, since no social scientist can ever know in advance what new form of society, or law of human relationship, can evolve in the future.

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Teilhard disagrees with this position for the simple reason that he claims that an unchanging law of evolution does in fact exist. Evolution in the social as well as in any other sphere proceeds in the direction of higher and higher complexity of material structure, accompanied by an increase in the consciousness of the system. At the human level this corresponds to an increase in self-awareness among the members of social aggregates. In other words Teilhard does not claim to know what form social reality will assume in the future, but he does believe that it is possible to perceive a general law of human—and social—evolution. We will examine in the next section what this law is supposedly like. In the meantime, the important point to recognize is that if we accept Teilhard's position, then our notions of what is social reality, and of what is the task of the social scientist, must be altered drastically.

DO NATURAL LAWS SPECIFY VALUES?

If one were to accept the premise that complexification—as defined in the next section—is the material basis on which the development of human consciousness is predicated, then it seems that the “value-free” stance underlying contemporary social science loses much of its meaning and its attractiveness. Rather than adopting cultural relativity and denying itself the use of values, social science would become concerned with looking at social reality from the “biased” standpoint of the evolution of consciousness. In looking at social systems, structures, norms, roles, and sanctions, the sociologist would look for complexity as the unifying theme in the phenomena he studied, and he would be asking the question: does this particular structure allow the development of consciousness more or less than structures that seem to be otherwise functionally equivalent? In other words, accepting Teilhard's premise would give theoretical sociology an explicit criterion of evaluation, and applied sociology a normative direction. This would align the social sciences closer to medicine, where the criterion of “health” explicitly underlies even the most basic research, and farther away from the traditionally “value-free” natural sciences. Of course, in point of fact the natural sciences themselves have never been value-free intrinsically, as more and more people are beginning to realize: the implicit assumption of the scientist has always been that replicable observations made under experimental conditions lead to the true understanding of reality, and the criterion of proof for this assumption has been his ability to control the environment in ways that make sense, more or less, from an anthropocentric perspective.¹² The “self-evident” quality

of knowledge in the physical sciences or mathematics is in reality predicated on the existence of a "special consensus" similar to that which a shaman has to provide to his apprentices in order for their reality to be validated.¹³

But Teilhard's criterion of consciousness is certainly not a new idea: other thinkers have tried to isolate such a central theme to give a coherent meaning to the unfolding of human evolution. Just within the last generation one might mention Croce, who asked historians to consider freedom as the central thread running through history,¹⁴ or Berdyaev who attempted to do the same for social philosophy,¹⁵ or Sorokin who presented the concept of love as a unifying criterion for the social scientist.¹⁶ If these attempts have been on the whole unsuccessful, it is mainly because their proponents have been unable to specify their criteria and present them in a form that could be readily used by historians, social philosophers, or sociologists. We should then expect Teilhard's notion of complexity to be amenable to a more practical, perhaps even operational, definition.

This is exactly what we propose to do; but first we must face an initial problem. From what has been said so far, it would seem that Teilhard's whole system stands or falls on the assumption that evolution has in fact progressed, from the development of physical molecules to human aggregates, along a path of increasing complexification. In fact, many natural scientists contend that there is no such underlying pattern in evolution: some relatively complex animal species have been replaced by less complex forms, and, moreover, it is impossible to ascertain scientifically what species might be dominant at any given time. And finally, even if there was such a trend in evolution, this would not mean that complexification was a "general law" that will necessarily affect the future.¹⁷ Even if one grants the weight of these objections, Teilhard's model is not thereby invalidated. The fact is that the criterion of complexity, on the human scale, is more of the nature of an "ought" than of an "is." If we develop the implication of the definition of man as "evolution become conscious of itself" then it follows that to pursue complexity is a matter of choice: evolution up to man might not have proceeded unfailingly according to the pattern of complexification, but this course of action is open to man.¹⁸ Teilhard was well aware that humanity might not choose to follow this plan of evolution, and outlined all the hurdles which stood in its path. So, to paraphrase Voltaire, if complexification did not exist, it would be necessary to invent it. But then one should evaluate the criterion of complexity/consciousness on its own merits, without regard to its

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scientific inevitability, and in order to decide whether Teilhard's idea is worth adopting as a normative basis for social science, we have to develop it and open up its implications for discussion.

STRUCTURAL COMPLEXITY AND HUMAN CONSCIOUSNESS

Teilhard's concept of complexity is an attribute of systems, whether at the physical, biological, or social level. Complexity is a function of two factors: the *specialization* (or diversification, or uniqueness) of the units that make up the system, and the level of *integration* of the units within the system.¹⁹ A system with more diversified elements, or whose elements are more thoroughly integrated with each other, or both, is more complex than an otherwise equivalent system. Integration can be further defined as the mutual dependence of the units on each other, or in information-theory terms, as the ability of the units to exchange information within the system. One further variable that bears on complexity is the kind of "energy" that keeps the system in an organized state.²⁰ In Teilhard's usage *tangential energy* (as applied to human systems) is the force of necessity or coercion which is instrumental in keeping a group of people interacting together: people participate in hunting parties or armies mainly because of tangential forces. *Radial energy* depends for its existence on the organization made possible by tangential energy: in other words, necessary material causes are responsible for the development of any human aggregate; but once this is formed, voluntaristic solidarity binding its members might arise within the group and be more important for its cohesion than the external causes.²¹ The higher the radial/tangential ratio of forces in a system, the higher the potential complexity of the system. Whether a group is held together mainly by tangential or radial energy depends on the original energy input of the system, and on the subsequent complexification of the system. A group of scientists might be captured by an alien power, for instance, and assigned to work on a certain task. The initial energy input in this case would be almost exclusively tangential and the resulting group would not be very complex; but if the captured scientists were to find pleasure in each others' company despite their captive status, the complexity of the group might increase.

The importance of the concept of complexity for Teilhard resides in the fact that human consciousness can evolve only as a result of the further complexification in man's nervous system, or what is even more important, as a result of the further complexification of the social patterns he develops. We all know that early sociologists have viewed individual psychic differentiation to be caused by the division of labor

in society,²² or that Redfield saw the main difference between "civilized" and "primitive" people to consist in the peculiar self-awareness, ability to reflect and to be critical, that the former possess; a change he ascribed to the complex and diversified roles that men first had to assume during the first urban revolution, circa 4000 B.C.²³ Consciousness, in Teilhard's terms, is really nothing more than the experience of complexity at the human stage of evolution. To be conscious for man is to reflect on his own complexity: phenomenologically it means an awareness of one's own desires and possibilities, and an ability to empathize with the desires and possibilities of others. Thus, paradoxically, man becomes more complex (and conscious) the more intimately he is related to others—as long as he does not have to sacrifice his uniqueness, or the voluntariness of his participation in the relationship.²⁴

These are the almost embarrassingly simple variables in Teilhard's scheme. Despite its simplicity, however, the scheme seems to be able to generate a great variety of useful models for the understanding of data about social behavior. Let us take, for instance, some findings in microsociology to see how the complexity model can help us to understand them better. Research done by Bavelas, Leavitt, Shaw, and by others, shows that small experimental groups working at problem-solving tasks develop different types of relationships depending on the seating arrangement provided, and therefore on the pattern of internal communication that develops within the group.²⁵ A *circular* seating arrangement produces a better integration of the members: nobody feels particularly isolated from the others, no leadership develops, and the members of the group enjoy the experience. Circular groups solve existential problems that have no predetermined solutions faster than groups seated in different arrangements, but they have a more difficult time in solving problems with prescribed solutions. A *linear* seating arrangement produces group interaction that is in many respects the opposite of the circular one: the centrally located individual emerges as the leader, the others feel increasingly marginal the further away they are from the center. The leader enjoys the task, but marginal members do not. The linear group deals efficiently with "closed" problems, but has a difficult time agreeing on the solution of "open" ones.

If one applies the available theoretical models, these results remain interesting, but disconnected, bits of information. Teilhard's concept of complexity, however, allows us to see the findings in a new light: small groups of the same size can be organized structurally so as to increase or decrease their internal complexity. The circular group, al-

though less efficient or less functional in certain types of tasks, is—other things being equal—the more complex and therefore the most likely to further the consciousness of its members. Elsewhere I have tried to show how different common patterns of interaction among people in different cultures might lead to the same results.²⁶

If the notion of complexity can yield a valuable normative criterion to small-group research, it can also be equally well applied to problems in macrosociology ranging from studies of entire social systems to problems in urbanization. In the next section we shall try to develop at some length a developmental analysis of the institution of the family from this perspective.

But before we do this, it should be made clear that simple as the concept of complexity might seem initially, its application is far from being always obvious. Let us take, for instance, a relatively simple situation. Suppose we are confronted with two musical events: a traditional performance of Bach's works, and a rock 'n' roll evening featuring one of the extreme new groups. The two events are legitimate subjects of sociological study: although impermanent, the two audience-performer aggregates are for a few hours a "group," and the event is one of a set of recurring cultural phenomena. The question is: which of these two temporary groups is more complex? If we assume that the structural arrangements of the groups are identical (i.e., rows of theater seats), the answer is far from obvious. One might perhaps look at the formal structure of the musical scores that are performed and conclude that the Bach concert must be the more complex of the two. But this would be misleading since complexity refers to the individual freedom of each member to be himself and to the feeling of belonging that binds each member to the others. A group of teenagers whose individual development has been associated with rock 'n' roll rhythms will not find a Bach evening consciousness-producing, while they might gain increased consciousness from listening to the rock 'n' roll group. So that if in an absolute sense we might perhaps say that everything else being equal the Bach evening will produce a group of highest complexity, we should also recognize in the same breath that everything is never equal. This conclusion seems to bring us back to a position of cultural relativism, except that we have gained a direction: we can acknowledge that rock can be just as consciousness-expanding as Bach, or more so, yet we can also say that Bach allows for more potential complexity provided that the individuals in the group are able to integrate the music into their consciousness, in other words provided that they can respond spontaneously to all its complexity.

These first attempts to apply a few of Teilhard's central ideas to sociology are necessarily crude and not specific enough; the only way to refine and strengthen this approach is through further discussion, criticism, and applications of the ideas to a variety of empirical problems.

A DEVELOPMENTAL VIEW OF THE FAMILY

To give a cursory developmental sketch of even the simplest of social institutions in such a short space is certainly a foolhardy attempt, and the family, despite its structural clarity, is not a simple structure in Teilhard's terms. Ambitious as the task might be, it is one worth trying as an exercise in the application of the complexity-consciousness model.

Most students of human evolution agree that the establishment of the family—the formal recognition of kinship ties—is a turning point in man's emergence from his animal past. When man becomes able to recognize and symbolize his relationship to other men, the first element of culture has emerged. The significance of this step is well expressed by Lévi-Strauss:

avant elle [the incest taboo] la Culture n'est pas encore donnée; avec elle, la Nature cesse d'exister, chez l'homme, comme un regne souverain. La prohibition de l'inceste est le processus par lequel la Nature se dépasse elle-même; elle allume l'étincelle sous l'action de laquelle une structure d'un nouveau type, et plus complexe, se forme, et se superpose, en se les intégrant, aux structures plus simples de la vie psychique, comme ces dernières se superposent, en se les intégrant, aux structures plus simples qu'elles-mêmes, de la vie animale. Elle opère, et par elle-même constitue, l'avènement d'un ordre nouveau.²⁷

For Lévi-Strauss, "the spark that causes the emergence of a new order" is man's discovery that through the regulation of marriage he is able to establish bonds of solidarity which are not present in the "natural" state. The incest taboo is "not so much a rule that forbids marriage with mother, sister, or daughter, but rather a rule that requires to give mother, sister, or daughter to someone else."²⁸ Of course, bonds that facilitate cooperation exist all through the animal phyla, uniting parents with each other and with their offspring in behavioral patterns that facilitate their survival. This differs from the bonding mechanism of the human family in that the latter has become a *conscious* process, and in so doing it has entered a new dimension of complexity and flexibility—what we usually call the "cultural" dimension.

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Although it is impossible to adduce evidence on the subject, it is safe to assume that the main causal factors involved in the development of kinship systems are essentially of two types. The first of these is man's reflection on the existence of "natural" ties between him and other human beings. The biological relationships of intercourse and birth, upon conscious reflection, yield the cultural concepts of marriage and descent. Thus the statuses of kinship, implying complex sets of reciprocal obligations and privileges, have arisen in part from the recognition of biologically constituted ties; but the crucial factor is that these ties have been given meanings in the new cultural context, and they have served as cornerstones for the building of the whole kinship institution, with all its statuses more and more removed from their original biological connection. But the "culturization" of simple biological ties would not have spread to all known human groups had it not offered an edge in survival to those who adopted it. The second types of explanation for the existence of the family stresses the advantages that a cooperating unit with a clear role structure has over a collection of individuals related through undefined expectations. In other words we can see the evolution of the family as a result of man's conscious realization of biological relatedness, and of the competitive advantage that such a realization brought to those who had adopted it.

It should be noted that up to this point the "explanation" for the existence of the family relies only on variables that Teilhard would classify as manifestations of tangential forces. Biological relatedness, and selective advantage for survival, are material, determining causes which force people into a relationship. At the beginnings of the family and during much of its history we do not often see spontaneous love, friendship, or respect binding the members of the institution together in a voluntaristic unit. We see instead the requirements of collective and individual survival prescribing the roles of the members; and the family unit is held together by considerations of need, strength, or financial advantage. Nevertheless, as Teilhard's model suggests, every system that becomes more complex in its material structures will also generate an increased amount of radial energy, which manifests itself in this case as interpersonal ties that are more and more independent of instinct and of other tangential forces.

Let us follow this development more closely. As we have seen, man is forced by selective evolutionary pressures to live in relation with others. This forced union, however, produces a more complex system: a group whose members take on relatively specialized roles. As Teilhard has said, "union differentiates";²⁹ and the larger the kinship unit,

the more uniquely varied its members' activities can become, at least potentially. The differentiation of roles produces, in its turn, a differentiation in the family members' perspective on the world, resulting in increased psychological complexity for the group. And in a complex group each member has the potential of absorbing other individuals' points of views, different from his own. Thus the psychological complexity of the group complexifies the individual's consciousness. The main results of this process are that man becomes able to empathize with others, and that the radial forces binding him to others become stronger: love, friendship, respect begin to act as real forces, even though still infinitesimal in comparison with the tangential forces of instinct and need. The feelings of love and brotherhood could not have been experienced by man living alone, or in a nonstructured relationship with others; it is to the complex, constricting bonds of kinship that we owe the emergence of this new type of social bonding force. And as a result, it is now possible to envision marriage and kinship ties based not on material interest but on much more subtle psychological needs, and perhaps even on "disinterested" love. Admittedly, human relationships held together mainly by such refined sentiments (or radial forces) are still more of a theoretical possibility than even a limited practice. But evolution is an exceedingly slow process, and even only a few thousand years ago it seems to have been impossible to conceive of a stable and legitimate human relationship based only on the voluntary and mutual attraction of its members. Therefore it should not be surprising that just a few thousand years later we are not yet able to build stable social structures (even simple dyadic ones) with just radial energy alone.

The point that Teilhard's model clarifies is that man could not have evolved the consciousness necessary to develop his culture without having been the member of an ever complexifying social matrix. The family has been the most "natural," the most simple unit of the matrix, and therefore universally the first step in social complexification. But the very success of the family as a structural unit constitutes its limitation from an evolutionary perspective. If man is to build structures of a higher complexity—and thereby increase the range of his consciousness—he has to withdraw some of the energy invested in the family and use it to form less and less natural units: clans, tribes, cities, nations. At each level of complexity, and before a higher level is achieved, there is a period of apparently chaotic decay during which the old bonds are loosened. But the dissolution is a necessary precondition if a more complex restructuring is to occur.³⁰ For instance, the concept of na-

tionality has to be outgrown and in part discredited before a universal political body has any hopes of becoming established. Of course there is no guarantee that the complexification of social structures, and consequently of human consciousness, will continue to proceed essentially in a linear direction, despite local aberrations, relapses, and various historical horrors. As the complexity of human institutions increases, and consciousness follows apace, the drag of entropy becomes ever more perceptible. The possibility of evil grows at the same rate as consciousness does. There is no way of knowing whether man will have enough radial energy—enough love, sympathy, self-control—to keep abreast with the ever-expanding need for cooperation that is being thrust upon us. The old institutions that used to regulate men's relation with one another are being freshly discovered and found shockingly wanting: laws, beliefs, ways of life that a former generation had freely built as the highest expressions of man's evolving consciousness are now seen by a new generation as manifestations of tangential energy that constrict the evolution of consciousness. Just as the application of tangential energy produces new radial energy, so when the latter becomes objectified it inevitably turns into tangential force. This is the dialectic of evolution, according to Teilhard, and we are now in a period in which the consciousness developed and accumulated under the present social institutions is straining to burst the structures that have created it and help create a new set of social institutions more congruent with itself.

But what is happening to the family while the rest of society heaves in the throes of change? We have seen that the family, by developing consciousness and thus allowing the emergence of more complex institutions, has made itself obsolete in many important respects. The family is no longer a necessary defensive, economic, or status-giving unit; its importance as a training institution for the values and the occupational roles of the society has also drastically diminished. In fact we would say that most of the tangential forces that kept the family together have ceased to exert pressure. This means that the family can now be a truly voluntary institution, one in which people can join freely for simply emotional reasons. Parsons has noted this change in the function of the American family,³¹ a change which, although still mostly potential, is nevertheless drastic enough to deserve recognition. Following Teilhard's model, we would say that the radial/tangential energy ratio is now rapidly increasing in both the input and the output of the family system. Ideally, the function of the modern family, emancipated from its material responsibilities, is to create a social environment in which members accept, understand, and love each

other despite (or more exactly *because of*) individual differences. In other words the evolutionary task of the family is now that of increasing consciousness by providing a psychologically complex unit, where love constitutes the bond that is required to keep the system going, and where respect for individual differences and encouragement to express them allows for the individuation of the system's component parts.

It should also be kept in mind that the dyadic relationship institutionalized in marriage is in all probability a transient form of a basic social bond, and that if evolution continues, more complex forms will surely replace it.³² But in the meantime Teilhard's theory suggests that we cannot advance by cutting corners, by removing too many of the tangential supports at once. Heightened consciousness requires a complex structure to support it; but a complex structure cannot be maintained on radial energy alone unless the people involved in it have already achieved a high enough level of consciousness. Thus the long centuries of arranged marriages were the prelude to the development of the feeling of reciprocal love that can make free marriages possible now. This kind of explanation is not based on any Lamarckian notions of evolution, or on Jungian beliefs in an inheritable collective unconscious. Simply, it claims that social feelings like cooperation, friendship, and love, rather than being the original causes that contributed to the formation of social groups, are, on the contrary, some of the effects of living in social groups. Once such feelings are first experienced as a result of interaction, they can be objectified through signs and symbols and become part of the culture. The real meaning of human evolution, from Teilhard's viewpoint, is the accumulation of more and more complex experiences, resulting from more and more complex interpersonal relationships, which through the medium of culture increase the complexity of individual consciousness, century by slow century.

Of course, this is only one side of the picture. As Teilhard was well aware, interaction also makes possible the refinement of selfishness, intolerance, and hate. So the potential for higher complexity in interpersonal relations proceeds step by step with the potential for increasingly destructive antisocial forces. The task of those who feel called to work for the advancement of consciousness is to find ways to reduce the likelihood of entropy prevailing over complexification by an appropriate manipulation of tangential and radial energies. According to Teilhard, there are two general trends that endanger complexification. He calls these *repulsion* and *materialization*,³³ manifested at the human level as selfishness and conformity, respectively. To apply these concepts

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to the family, we can see that materialization is the consequence of overly strong tangential forces; when the family must keep together in order to survive in its physical or cultural environment, its members are forced into their kinship roles, and there is little chance for individual freedom and for the fulfillment of personal potential. The family has been for a long time—evolutionarily speaking—on the materializing end of the continuum, and the development of complexity has been hindered mostly by excessive tangential pressures. In part this is still true, at least as far as the children's relationship to their parents is concerned; except for a few experimental communities such as the kibbutzim, children have no choice about their filial role until they come of age. But, on the whole, the danger of repulsion is perhaps becoming the paramount one in contemporary technological societies; consciousness is still not strong enough, in general, to maintain a complex institution equivalent to the family in the absence of external pressures. How to help avoiding the Scylla and Charybdis of materialization and repulsion offers a noble challenge to the ingenuity of the social scientist. In fact we can be sure that eventually natural selection will determine which forms of social institutions are worth preserving and which are not. But the selection procedures of evolution are often exceedingly harsh. So it is our task as social scientists to ease the birth-pangs of evolution and hasten the processes by which man can develop enough consciousness to cope with his human condition.

CONCLUSIONS

By now it must be perfectly obvious that this exposition of some of the basic elements in the thought of Teilhard de Chardin is "biased" in favor of the theory presented. The bias stems from the feeling familiar to many social scientists today that a new operational basis is needed for the sciences of man if these are to be better attuned to the understanding of peculiarly human problems. Sharing this uneasiness, I have presented this explication of Teilhard's theories in the hope that it can stimulate a discussion and a reevaluation of the goals of social science. Specifically, Teilhard's concept of the evolution of consciousness appears to give such a goal, and a normative theoretical direction acceptable to reasonable men regardless of prior scientific or religious commitments. The potentially operational concept of complexity/consciousness offers what seems to be a very useful evaluative criterion for comparing social structures and giving direction to social change. The constructs which Teilhard calls "tangential" and "radial" energies could open up for study a hitherto unmanageable range of social phenomena. Although this brief exposition barely begins to unfold the possibilities

inherent in Teilhard's works, it is hoped that some of the ideas hinted at here might grow into usable parameters for the understanding of man.

In conclusion, the main goal of this paper could not be better summarized than by quoting a beautifully concise passage from Jaspers:

The question of the nature of man relates to a number of further questions: What does man *will* to make of himself, and what *can* he make of himself? What *purpose* is this transformation to serve? Consequently man has two profoundly different attitudes toward himself: He can *observe and investigate himself* as an existence that simply is of such and such a nature and that undergoes alterations in accordance with discoverable laws, and he can also submit to criteria and *impose upon himself demands* which must honestly be acknowledged if he is to insure his own regeneration. He cannot actually do the one without the other, for a complete and final separation would cripple or impoverish his attitudes. However a methodological separation is unavoidable as a temporary expedient. We call the observation of man's existence "anthropology" and "psychology," while the making of demands upon the innermost nature we call "philosophy." Psychology investigates, makes discoveries, and predicts. Philosophy appeals, projects possibilities, and prepares the way for decision. *But tacitly present in all human psychology is an interest in possibilities and an appeal for further self-development*, just as, in all philosophy, psychology continues to function as a means of expression as well as a condition without which the philosophical appeal would remain thin and insubstantial [last italics added].³⁴

This paper is an attempt to reintegrate "an interest in possibilities and an appeal for further self-development" into the methodology of the social sciences.

NOTES

1. See, e.g., F. Russo, S.J., and R. T. Roth, S.J., *The Meaning of Teilhard de Chardin* (New York: America Press, 1964); Robert J. O'Connell, S.J., "Teilhard at Fordham: 1963-1964," *Dialogue* 3 (1965):382-84; R. J. O'Connell, S.J., ed., *Teilhard Conference Proceedings* (New York: Fordham University Press, 1964); M. H. Murray, *The Thought of Teilhard de Chardin: An Introduction* (New York: Seabury Press, 1966); George A. Riggan, "Testing the Teilhardian Foundations," *Zygon* 3 (1968):259-322 (including an extensive bibliography); B. Delfaauw, *Evolution: The Theory of Teilhard de Chardin* (London: Collins Sons & Co., 1969). For some French works on Teilhard, see Claude Cuénot, *Teilhard de Chardin: Les grandes étapes de son évolution* (Paris: Plon, 1958); C. Cuénot, *Teilhard de Chardin* (Paris: Edition du Seuil, 1962); L. Bayou, S.J., and P. Leroy, S.J., *La carrière scientifique de Pierre Teilhard de Chardin* (Monaco: Editions du Rocher, 1964); L. Barral, *Éléments du bâti scientifique Teilhardien* (Monaco: Edition du Rocher, 1964); H. de Lubac, *Teilhard et notre temps* (Paris: Editions Aubier Montaigne, 1969); A. Lanoux et al., *Teilhard de Chardin* (Paris: Librairie Hachette, 1969); Mgr. A. Combes, *Teilhard de Chardin* (Paris: Editions Seghers, 1969). In 1969 at least eight new books were printed in France by or about Teilhard, and at least three more were scheduled to appear before 1970. In Great Britain, Collins alone has published eighteen books by or about Teilhard, three of them during 1969.

2. Sir Julian Huxley, "Introduction" to *The Phenomenon of Man* by P. Teilhard de Chardin (New York: Harper & Bros., 1959), pp. 11-28; Theodosius Dobzhansky, *Mankind Evolving: The Evolution of the Human Species* (New Haven, Conn.: Yale University Press, 1962), p. 347; Th. Dobzhansky, *The Biology of Ultimate Concern* (New York: New American Library, 1967), pp. 108 ff.; Th. Dobzhansky, "Teilhard de Chardin and the Orientation of Evolution," *Zygon* 3 (1968):242-58.
3. P. B. Medawar, "Critical Notice: *The Phenomenon of Man*," *Mind* 70 (1961): 99-106.
4. J. E. Page, S.J., "The Phenomenon of Urbanization and Teilhard," in *Teilhard Conference Proceedings*, pp. 71-75; W. Stark, "Teilhard and the Problem of Human Autonomy," in *Teilhard Conference Proceedings*, pp. 77-93. For a typical Marxist treatment of Teilhard's social implications, see N. Tertulian, "Marxismul și gândiero lui Teilhard de Chardin," *Viata Românească* 18, no. 12 (1965):182-93; Roger Garaudy, *From Anathema to Dialogue: A Marxist Challenge to the Christian Churches*, trans. Luke O'Neill (New York: Herder & Herder, 1966), pp. 48-54.
5. Sir Karl R. Popper, *The Logic of Scientific Discovery* (New York: Harper & Row, 1965), pp. 31-39.
6. See, e.g., M. Stein and A. Vidich, eds., *Sociology on Trial* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), esp. pp. 96-126; M. Csikszentmihalyi, "Marx: A Socio-psychological Evaluation," *Modern Age* 11 (1967):273-82; S. Jonas, "Talcott Parsons ou le roi nu," *L'Homme et la société* 1 (1966):53-65; T. Bottomore, "The Strange Case of Talcott Parsons," *New York Review of Books* 13, no. 8 (1969): 34-39.
7. There is excellent reason for refraining from a general evaluation of Teilhard's ideas since this has been done before in the pages of *Zygon* (see Riggan, "Testing the Teilhardian Foundations"; Dobzhansky, "Teilhard and the Orientation of Evolution"; Van R. Potter, "Teilhard de Chardin and the Concept of Purpose," *Zygon* 3 [1968]:367-76; Alfred P. Stiernotte, "An Interpretation of Teilhard as Reflected in Recent Literature," *Zygon* 3 [1968]:377-425; Francisco J. Ayala, "A Note on Evolution and Religion in the Light of Teilhard's *Divine Milieu*," *Zygon* 3 [1968]:426-31).
8. Among the more recent discussions see A. Maslow, *The Psychology of Science* (Chicago: H. Regnery Co., 1969); D. F. Horrobin, *Science Is God* (Aylesbury, Buckinghamshire: Medical & Technical Publishing Co., 1969); A. Maslow and P. Sorokin, eds., *New Knowledge of Human Values* (Chicago: H. Regnery Co., 1970); T. Roszak, *The Making of a Counter Culture* (Garden City, N.Y.: Doubleday & Co., 1969); H. Etzkowitz and G. M. Schaflander, "A Manifesto for Sociologists," *Social Problems* 15 (1968):399-407; H. Blum et al., "Developments of a New Consciousness and Social Order," *Interdiscipline* 4, no. 2 (1967):105-16; or witness the last few national professional conventions in any of the social sciences.
9. Teilhard de Chardin, *Phenomenon of Man*, p. 220.
10. Popper, *Logic of Scientific Discovery*, p. 61; Horrobin, *Science Is God*, p. 83.
11. Karl R. Popper, *The Poverty of Historicism* (New York: Harper & Row, 1964).
12. See, e.g., Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958), esp. pp. 248 ff.; Maslow, *Psychology of Science*; Roszak, *Making of a Counter Culture*; Horrobin, *Science Is God*.
13. One of the best examples of how "special consensus" can validate reality is in Carlos Castaneda, *The Teachings of Don Juan* (Berkeley: University of California Press, 1968).
14. Benedetto Croce, *History as the Story of Liberty* (London: George Allen & Unwin, 1962).
15. Nicolai Berdiaev, *The Beginning and the End* (London: Geoffrey Bles, Ltd., 1952).
16. Pitirim A. Sorokin, *The Ways and Power of Love* (Chicago: H. Regnery Co., 1967).

17. Popper, *Poverty of Historicism*, pp. 105 ff.
18. This is not Teilhard's own position, however. He held on steadfastly to the belief that complexification was a scientifically accurate description of evolution.
19. Teilhard de Chardin, *Phenomenon of Man*, pp. 48 ff.
20. It is perhaps unfortunate that the term "energy," with its precise connotation preempted by the physical sciences, should be used here as a rather vague, non-operational construct. The phenomenon that Teilhard describes as "tangential energy" presents no problems, since this is the kind of energy familiar to all followers of deterministic science. "Radial energy," on the other hand, is something utterly controversial. By this term Teilhard defines (at the human level of evolution) such phenomena as love, brotherhood, etc., which, though they originate in tangential forces, are not reducible to them.
21. Teilhard de Chardin, *Phenomenon of Man*, pp. 63 ff.
22. E.g., H. C. Carey, *Principles of Social Science*, 3 vols. (Philadelphia: J. B. Lippincott Co., 1867), 3:466 ff.; Eugène de Roberty, *Sociologie de l'action* (Paris: F. Alcan, 1908); É. Durkheim, *The Division of Labor in Society* (Glencoe, Ill.: Free Press, 1947); K. Wittfogel, *Oriental Despotism* (New Haven, Conn.: Yale University Press, 1957).
23. R. Redfield, *The Primitive World and Its Transformations* (Ithaca, N.Y.: Cornell University Press, 1953); see also R. Redfield, ed., *Levels of Integration in Biological and Social Systems* (Lancaster, Pa.: J. Catell Press, 1942), and R. Redfield, "Levels of Integration in Biological and Social Systems," in *Modern Systems Research for the Behavioral Scientist*, ed. W. Buckley (Chicago: Aldine Publishing Co., 1968).
24. Teilhard de Chardin, *Phenomenon of Man*, pp. 165, 262 ff.
25. A. Bavelas, "Communication Patterns in Task-oriented Groups," in *Group Dynamics*, ed. D. Cartwright and A. Zander (Evanston, Ill.: Row, Peterson & Co., 1953), pp. 493-506; H. Leavitt, "Some Effects of Certain Communication Patterns on Group Performance," in *Communication and Culture*, ed. A. G. Smith (New York: Holt, Rinehart & Winston, 1966), pp. 222-43; M. E. Shaw, G. A. Rothschild, and R. F. Strickland, "Decision Processes in Communication Nets," in *Communication and Culture*, pp. 253-58.
26. M. Csikszentmihalyi, "A Cross-cultural Comparison of Some Structural Characteristics of Group Drinking," *Human Development* 11 (1968):201-16.
27. Claude Lévi-Strauss, *Les structures élémentaires de la parenté* (Paris: P. U. F., 1949), p. 31; see also Yvan Simonis, *Claude Lévi-Strauss ou la "passion de l'inceste"* (Paris: Editions Aubier Montaigne, 1968), esp. chap. 2, pp. 33-81.
28. Lévi-Strauss, *Les structures élémentaires*, p. 596.
29. Teilhard de Chardin, *Phenomenon of Man*, p. 262 (see also nn. 22 and 23 above).
30. This is, of course, the reason for the systematic attempts made to eliminate the family as a strong unit, along with other institutions, whenever a new social order is established, as in the case of Soviet Russia, China, or the Israeli kibbutzim. See also Luigi Barzini's interesting analysis of the failure of Italian civic structures (*The Italians* [New York: Atheneum Publishers, 1964]), which he attributes to the exclusive loyalty Italians devote to their kinship obligations.
31. Talcott Parsons, "The Incest Taboo in Relation to Social Structure and the Socialization of the Child," *British Journal of Sociology* 5 (1954): 101-17.
32. See Teilhard's discussion on how civilization proceeds by incorporating "artificial" structures until they become "natural" and release energy for building new "artificial" structures of a higher complexity (*Phenomenon of Man*, pp. 221 ff.).
33. *Ibid.*, pp. 255 ff.
34. Karl Jaspers, *Nietzsche* (Chicago: H. Regnery Co., 1969), pp. 127-28.