Reviews

CONSCIOUSNESS, PURPOSE, AND MYSTERY

Science and Religion: An Interpretation of Two Communities. By HAROLD SCHILLING. New York: Charles Scribner's Sons, 1962. 272 pages. $4.50.

The New Consciousness in Science and Religion. By HAROLD SCHILLING. Philadelphia: Pilgrim Press, 1973. 288 pages. $7.95.

The times seem ripe for a reexamination of the ways we customarily think about science and religion. Dramatic changes at the most fundamental theoretical level have taken place in the hard sciences. At the same time Eastern and Western forms of religion have shown an unexpected vitality that contradicts earlier predictions of their imminent demise. Many recent books have argued that this creative ferment is the sign of an emerging period when science and religion will interact with one another in more positive ways than was the case in the past.[1]

On these issues two works by Harold Schilling are instructive. The first—*Science and Religion: An Interpretation of Two Communities*—provides a thoughtful discussion of methodological considerations on which a rapprochement between science and religion might be based. In a second book—*The New Consciousness in Science and Religion*—Schilling sketches in bold strokes a world view that brings into intelligible continuity the biblical faith in "God's continuing creative activity" with the scientific theory of evolution. This theme, present in the earlier book as a tentative suggestion, assumes in the latter work a crucial role.

Schilling is to be commended for his willingness to take speculative risks in thinking on these issues, although certain considerations make us pause before accepting them. However, even if tactical errors have been made at this level, his broader strategic principles in relating science to religion are not thereby invalidated. In this essay the merits of his general approach will be considered even while certain demurrers are raised to his more specific proposals.

THE HISTORICAL BACKGROUND: CONFLICT AND SEPARATION MODELS

The full thrust of Schilling's intent can be appreciated only when placed in the historical context of past ways in which science and religion have been related. Two main patterns can be recognized. The first is a conflict model in which religion and science are seen as entering into collision over rival truth claims about a single factual realm; thus Galileo and the Inquisition confront

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each other on matters of astronomy; Darwin and irate clergymen are at odds concerning the "origin of man." It is easy to dismiss such quarrels as unfortunate misunderstandings that now have been overcome. In fact, conflicts still remain, and it is difficult to judge their seriousness as challenges to the stability of our culture. One example is the continuing resistance to the theory of biological evolution by conservative Christian groups. Another is the widespread interest in ancient civilizations that are supposed to have existed in time periods contradicting the chronologies accepted by most contemporary anthropologists.[2] Such phenomena can be taken as expressive symptoms of a distrust of science that at a deeper level is based on suspicions that technological societies are leading mankind in directions destructive to humane modes of existence. Tensions of this sort are an indication that conflict between science and religion is not an affair belonging only to a less sophisticated past; it remains a very real possibility in our present. Some scientists are still haunted by dreams of superstitious barbarians in their ignorance destroying the grand achievements of scientific endeavor. Religionists, in turn, fantasize about technological utopias where religion is treated like an atavistic virus against which the inhabitants are immunized and protected.

However, the conflict model has not been the dominant one in either the past or present of Western civilization. Science and religion are both powerful social forces. Each has learned through bitter experience that the other is not vulnerable or helpless before direct attack. Western science, though a latecomer to the field of history, has had such spectacular successes that its place in human society seems for the time secure; religion, though heavy with age and tradition, shows an unexpected capacity to endure. Hostile confrontations lead to costly dissipations of energy on both sides that are without positive results. Thus a division of labor, which can be characterized as a "separation of realms," seems expedient. This approach is probably the dominant one among scientists, theologians, and other intellectuals and constitutes a kind of prevailing orthodoxy on the subject.

Francis Bacon, a representative thinker on these issues, put it succinctly when he urged that Western man "not unwisely mingle or confound these learnings [science and religion] together."[3] It is possible to interpret Kant's first critique as an attempt to give the principle more rigorous and theoretical expression. Kant in effect argued that Newtonian science, in which concept is united legitimately with percept, should have full dominion over the phenomenal world of sense experience. His readers have since debated whether he is a ruthless destroyer who has established science on the grave of religion or whether, in a more mediating spirit, he simply has established the clear boundary of their separate realms across which each may venture only in extreme peril. W. T. Stace argues that Kant's position implies that "the solution of the religious problem cannot be a compromise, but . . . scientific naturalism must be one hundred per cent true and religion must be one hundred per cent true. Naturalism is the sole truth about the natural order, and religion is the sole truth about the eternal order. Neither order interferes with the other."[4] On this approach religion and science are not relatively different discourses about the same subject matter but radically different kinds of language about radically different subject matters. In this vein Gilbert Ryle declares: "If the seeming feuds between science and theology . . . are to be dissolved at all their dissolution can come not from making the polite compromise that both parties are really artists of a sort working from differ-

ent points of view and with different sketching materials, but only from drawing uncompromising contrasts between their businesses. . . ."[5]

Differences continue to exist among thinkers as to the exact place where the boundary is to be drawn. Still, the nature of the demarcation is clear enough. Religion deals with something like faith, values, the other world, spirit, the sacred; science deals with knowledge, facts, this world, matter, the secular. Some of these terms are undoubtedly more acceptable than others. But a division along these lines seems to represent an unofficial but very real consensus. A minority of religionists may continue to fulminate against a godless science, and a minority of scientists may carry on crusades against the superstitions of religion. Such figures are deemed by the majority in both the religious and scientific circles to be guilty of bad form on the personal level and category mistakes on the intellectual level. If religion and science belong to radically different realms, neither agreement nor disagreement between them is possible or even intelligible. Let religion have heaven, and science, earth. Let it further be agreed that heaven appear on no map of earth and that the penultimate concerns of earth neither interfere with nor contribute to the ultimate harmony of the transcendent.

However, like all compromises, this one has some points of instability. There is the perplexing issue of values and ethics. The terms of the truce are notoriously unclear on this point. Some have argued that science is capable of developing a moral system out of its own resources, but others, perhaps the majority, have insisted that science is value free; if that is the case, we must look to some other group—theologians, humanists, poets, political theorists—for principles by which to direct for human good the power offered us by the scientists. However, sometimes a curious catch-22 logic plays havoc with the situation; the moralist is allowed to advise the scientists only if he can show proof of possessing the proper scientific credentials. But he can obtain these credentials only by surrendering the very value commitments that are needed to provide the principles for guidance. No doubt this is a caricature, but it does point up the way in which the problem of values puts into question the boundary line between science and religion.

In the same vein the desire of man to achieve some kind of unification of his various capacities and powers also impels him to question the finality of this dualistic arrangement. To insist that for tractical reasons science and religion can for a time best pursue their interests in terms of separation based on mutual respect is one thing. But to adhere to the separation as irrevocable and for all time is to introduce an ominous fissure into both our ontology and our psychology. It is, to say the least, odd that the external world which is our habitat should reveal absolutely no relation to whatever religious concerns have grasped the center of our inner life. It is curious that the development of our human capacities should require a dichotomization of ourselves into methodological atheists in one sphere and scientific innocents in the other. Will not the effort to maintain such rigid separations nourish in the end a metaphysical schizophrenia with a bad prognosis?

Concerns of this sort are behind current books that seek to reexamine the terms of the orthodox truce between science and religion and the principles on which it is based. The best of these are not ignorant of the danger of making category mistakes based on a confusion of realms. Schilling, for example, is an emeritus professor of physics who knows intimately the nature and workings of the scientific enterprise. He also is a Christian who has a firm

commitment to the ongoing life of the Christian community. He thus engages in his explorations of a positive relation between science and religion with full awareness of the theoretical and practical difficulties involved. He knows that not only scientists but also theologians like Paul Tillich have contended that "science and religion are so utterly different that they do not and cannot touch in such a way as to come into either conflict or accord, and that therefore neither can say anything that would either discredit or credit the other" (*SR*, p. 16). Schilling offers a thoughtful, well-considered challenge to this dictum which I will now examine.

Science and Religion: A Contextual Model

In *Science and Religion* Schilling seeks to surmount the impasse of the conflict and separation models. On one point these two models are remarkably alike. Both treat science and religion as self-contained and completely autonomous cognitive systems that must, because of their rival claims to self-sufficiency, either collide in the relentless opposition or else bypass each other without contact of any kind. Conflict or irrelevancy seems to be the only possibility.

Schilling rejects both. His thesis is that science and religion are "fundamentally not incompatible and inimical, and that they are not irrelevant either to each other or to the greatest concerns and needs of mankind" (*SR*, p. 6). He seeks to show how "the insights and methods of each can more effectively enrich the other" and "together contribute more significantly to the attainment of a well-balanced life and world view" (*SR*, p. 7).

Schilling's development of this thesis is full of interesting suggestions. In the end he does not really transcend the separation model in any substantive way, but he does provide a different perspective from which to consider it. This change in vantage point involves a direct challenge to the notion that science and religion are self-contained, completely autonomous enterprises, developing their insights in tight compartments hermetically sealed off from one another and from broader contexts of human meaning and concern. Schilling argues that such approaches are abstract and formalistic since they treat science and religion as self-sufficient systems vying with each other for ascendency in some rarefied realm of purely semantic issues. He proposes to consider science and religion as living communities that interact with each other in the concrete matrix of their historical existence. As an alternative to either a conflict or separation model, this appropriately could be called a contextual one.

Schilling attempts to turn from abstract formulation to concrete embodiment and to make use of descriptive sketches rather than formal definitions in dealing with the actualities of science and religion. He declares: "I shall not provide a specific definition of either science or religion. They are so comprehensive and many-sided that no brief definitions of them can possibly be adequate, . . . their meaning can therefore be conveyed only contextually (*SR*, p. 7). He is, of course, ready to provide ostensive indications of his starting point. Science means to him primarily the natural sciences—physics, chemistry, biology—with which he is most familiar, though he believes his descriptions, with proper qualifications, will apply to the social sciences as well. By the same token, religion in his discussion refers "in the main to the Judaeo-Christian tradition, and probably more often than not to Protestant Christianity" (*SR*, p. 7). Such a restriction of focus is justified by Schilling's understanding of religions as specific historical communities. Religions other than Chris-

tianity have their recognized place in this pluralistic matrix, but Schilling deliberately focuses on Christianity and the Western theistic tradition (*SR,* pp. 238–40). What his discussion thereby loses in scope it gains in concreteness.

The contextual approach emphasizes concreteness and complexity. Schilling observes that science is "something big, many-sided and far-reaching, rich with significance and potent in influence"; it is a body of organized knowledge, a method of knowing, an attitude, an influence in human culture. It is, in fact, "an actual social enterprise, an undertaking, an historical movement" (*SR,* p. 15). By the same token, religion also is in part an organized body of insight, an area of experience, a way of thinking, a way of knowing, a point of orientation, a way of life. "It likewise is a social enterprise, and an active, vital, and dynamic component of our culture" (*SR,* p. 16).

Schilling points out that, while the view of Christianity as a community is of long standing, the understanding of science as a communal activity is a more recent one (*SR,* p. 58).[6] Nevertheless, it is important because it helps dispel the misleading picture of science as some kind of absolute truth proceeding automatically from a reification called "the scientific method." Schilling questions the existence of such a hypostasis and argues that scientists use a variety of methods according to the operational context in which they are engaged. An understanding of science thus requires more than an analysis of logical issues involving deduction and induction. One must become acquainted with the concrete labors of scientists and the ways that they make discoveries, develop hypotheses, and go about validating them. Schilling distinguishes a frontier stage of science where imagination and the creative "seeing" of new patterns in familiar data are part of the process of discovery. The later "stage of colonization" of a new theory may be more humdrum, but the joint labors of the scientific community remain important. Even the much-prized scientific "objectivity" is a communal affair: "Objectivity cannot be achieved by a solitary individual, but only socially; i.e., when the observations and experiments of one scientist have been validated reciprocally through repetition by others" (*SR,* p. 51).

In the same vein Schilling points out that contemporary theologians have abandoned the stereotype of revelation as the direct impartation of divine truth in the form of apodictic propositions that are independent of time and place. The contemporary view is rather to look at revelation as a series of disclosure events in history that the religious community then interprets over a period of time.

Schilling in one place calls this emphasis on community the "unifying idea" of his study (*SR,* p. 56). Its importance lies in its power to humanize both science and religion and to rescue them from what we might call "angelic" pretensions to possess a kind of eternal knowing, free of entanglements with time and change. Christian theology has been guilty of this kind of hubris when it understood the revelation to which it responded as a set of timeless truths unaffected by cultural circumstance. Science has done the same when it presented its deliverances as absolutes freed from all reference to the human perspective in which they are formed. Contemporary theological discussions readily acknowledge that biblical revelation and the response to it occur in a social matrix that at least in part determines its significance and meaning.

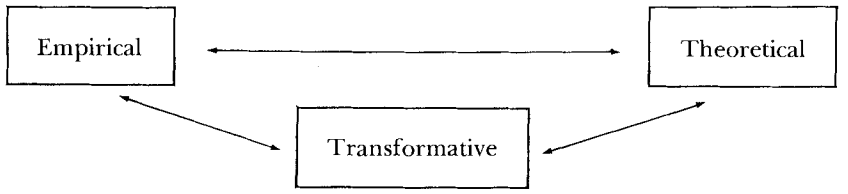
Similarly, quantum physics, for example, has developed a more sophisticated awareness of how its objective observations include concrete reference to the instruments making the observation so that "the interaction between

the measuring instruments and the objects forms an integral part of the phenomena."[7] Niels Bohr points out that, "far from giving rise to confusing complications, the recognition of the extent to which the account of physical experience depends on the standpoint of the observer proved most fertile in tracing fundamental laws valid for all observers."[8]

The point here is not that religion and science are similar cognitive enterprises but only that they both have become, in different ways, more aware of the human context in which they pursue their goals. This context in turn becomes the one in which interaction and cooperation can take place. Science and religion as living communities, for example, can support together the common goals of a future for man that is human and just.

This contextual or communal approach is perhaps useful in encouraging an atmosphere of informed, mutual understanding between science and religion. However, Schilling in places wants to go further and establish points of theoretical as well as practical interaction between the two. This part of his analysis is based on a dictum that he repeats several times in his study: "All knowledge without exception is derived from a critical interpretation of what is given in human experience" (*SR,* pp. 140, 192). It is obvious that such a statement in a very general way applies to science, though further clarification of the kind of experience meant is still required. Does the dictum also apply to Christianity? Schilling argues that it does since revelation is understood as disclosure events occurring in the matrix of history and given conceptual clarification by theology. "Theology is the conceptualizing, interpreting, explaining, theoretical part or aspect of religion" (*SR,* p. 68). Schilling sees theology as performing a function in religion analogous to that of a scientific theory in science. In this vein he develops an interesting account of the dynamics of scientific activity involving a threefold circular model that he then finds present in religion as well.

First are empirical descriptions of data based on observations and experimentations. Second are theoretical constructs for purposes of generalization, explanation, and prediction. Third are the practical applications of scientific theories in the form of technological invention. Schilling calls this the "transformative" sphere of science since it makes changes in man's natural and cultural environment. So much is obvious, but Schilling argues that the relation among these three spheres is not one of unidirectional causality, that is, a kind of irresistible and unambiguous movement from *A* to *B* to *C*. On the contrary, the relation is circular, conveying a reciprocal influence working both ways (*B* affects *A* even as *A* is affecting *B,* while *C* is affecting *A* even while *A* is affecting *B*). As Schilling puts it, this relation among the spheres is "non-logically circular in experience and thought, rather than logically columnar (*SR,* p. 86). A reproduction of Schilling's diagram in simplified form will illustrate this point.



According to Schilling, religion exhibits the same kind of structural relation among its parts as do the sciences. Thus, for example, the circular diagram is useful to explicate how religion reveals an experiential or empirical factor (*A*), a theoretical or interpretive one (*B*), and a transformative one (*C*). The last is represented by ethical and spiritual activity that affects and changes both personal and social life. The second, in a religion like Christianity, pertains to theology, which is involved in a conceptual formulation of experiential data. The first component—experience—is harder to specify with unambiguous exactitude. Schilling does not mean "religious experience" in the sense of specific emotional or ecstatic events in the subjective consciousness of the religious person, though presumably such phenomena might be included in the broader rubric he is attempting to establish. Schilling appeals to the commonsense meaning of the term. It is "what happens to people, is imposed upon them by the realities of existence"; it involves "the whole of a man in his relation to all of his environment" (*SR*, pp. 76–78). So far as Christianity is concerned, religious experience is that which has occurred in the Christian community—agape love among its members, prayer, self-sacrifice, the understanding of certain historical events in the context of a God who has transformed lives through Christ's love.

If the reader is inclined to find this account of Christian experience fuzzy around the edges and an ambiguous interfusion of facts and interpretations of those facts, he should remind himself of the importance that Schilling has placed on the principle of circularity. The empirical component in any cognitive process is not a realm of pure facts existing in pristine separation from the theoretical transformative components. Schilling argues that there are no "bare facts" in either science or religion and that "scientific seeing," for example, is "more than mere staring or gazing. It requires, and in fact always is accompanied by, some selecting, discriminating, abstracting, conceptualizing, correlating, and interpretational cerebration" (*SR*, p. 98). The full meaning of experience "cannot be stated by intensive definition, but can be communicated only ostensively or contextually" (*SR*, p. 77).

Schilling's emphasis on the circular relation among facts, interpretations, and pragmatic action is important. However, his use of it as a way of comparing science and religion seems strained and forced. The kind of experience that Schilling identifies with the Christian community—agape love, for example—seems qualitatively different from the perceptual data of the physicist. Theological constructs do share with scientific theories the use of concepts, but their respective verifications are hardly comparable. Finally, practical labors of the church—the founding of hospitals, schools, etc.—may be called, as Schilling does, a Christian "technology," but the "transformative" intents of religion and science are not really of the same kind unless Christian good and technological mastery are simply identified.

There is, in fact, a certain obscurity here as to Schilling's purpose. He insists that he is not arguing that theology is a science; nor is he attempting to exploit analogies between science and religion (*SR*, p. 66). Yet he admits that he often has been understood in just such a way (*SR*, p. 13); indeed, it is difficult to avoid such an interpretation when a comparison between the threefold circular forms of science and of religion is made so forcefully. It would seem that Schilling's concern is to preserve for theology some kind of cognitive function. While acknowledging the obvious differences between science and religion, he wants to show that in certain respects religion, as well as science, yields

a kind of knowledge. In this regard, Schilling makes use of an intriguing diagram devised by Henry Margenau to disclose the relation between the concepts of one science (like physics) and another (like biology). Margenau himself extends the diagram to encompass other disciplines like ethics and religion, and Schilling does the same with a modified version of his own.

It is not necessary to reproduce the diagram; it is sufficient to note that on the left is a vertical line representing the *P*-plane of human experience. On the right are circles representing conceptual constructs that are cognitive responses to experience: They are based on reflection, selection, analysis, synthesis, and abstraction and constitute various sorts of scientific theories. The sciences themselves are placed alongside one another in a vertical order so that, while each responds to the *P*-plane of experience, some of the constructs of one science may be connected also with the constructs of another. For example, molecular theory in physics is connected with similar constructs in biology and astronomy.

Schilling then places in the diagram the conceptual fields of religion (or religions). In so doing he is suggesting that the constructs of theology (the theoretical components of religion) might interact, at least in principle, with the constructs of some of the sciences. Furthermore, he points out that concepts in various scientific disciplines—physics, chemistry, biology, sociology—exhibit shifts in meaning along a spectrum of interconnected but changing senses. For example, as we move from physics through biology to sociology, we see gradual changes that eventually become significantly different. "Theories become progressively less mathematical. Interpersonal communication and cross-checks and therefore verification become less easy." Nevertheless, the important claim is made: "The Margenau diagram *is* applicable to them all. Knowledge is *one*. In all fields, it is gained by the interplay of given data and constructed concepts—though these may display different properties in different fields" (*SR*, p. 195). Furthermore, the Margenau diagram may be extended to apply not only to the "sciences" but to humanistic disciplines like art and religion, where the same kinds of relations pertain though with distinctive features that make religion a very different affair from physics, though not unrelated to it. Schilling insists: "There is only one continuum of experience, only one *P*-plane and one *C*-field extending throughout the entire length of the spectrum—the entire realm of knowledge. No one can say where physics ends and chemistry begins. Nor is there a dividing line between biology and psychology. And this continuity extends into the realm of religion as well" (*SR*, p. 196).

This use of the Margenau diagram to indicate the relation along a broad spectrum of meanings from the hard sciences to religion is intriguing and important. However, in Schilling's exploratory account, it promises more than it actually delivers. One problem is that the meaning of the *P*-plane itself (i.e., "experience") changes drastically as one moves from the sense data of physics to the disclosure events of theology (*SR*, p. 194). Furthermore, the distance along the continuum between a physical science and theology is so great that direct, meaningful engagement between their constructs is not likely. Thus Schilling admits that "the insertion of God into a scientific theory cannot contribute to the solution of any scientific theory" (*SR*, p. 197). Similarly, the laws of physics do not seem to have direct relevance to theological matters. It would seem that, even if we allow theology to appear in a diagram representing a continuous spectrum of disciplines, theology and the physical

sciences would be so far apart that the contact between them would be very indirect. The model of a separation of realms in some absolute logical sense might be denied; a practical separation between them still remains.

Schilling's use of the Margenau diagram as a challenge to the "separate realms" model is thus not as radical as it first appeared. He has not really brought science and religion into direct interaction but has merely established ways in which the separate realms are colaborers in a common human area (the *P*-line of experience). Of course, this is in itself helpful. Schilling says at the start of his book that he is concerned mainly with the "incongruous attitudes and feelings," the "conflicting purposes and goals" that seem to be generated between the realms. His emphasis on a common social and experiential context in which both science and religion operate can help support a sense of their complementary (but nonetheless separate) functions in the common human enterprise.

Schilling is not content to leave the matter with this practical resolution of conflict. Toward the conclusion of *Science and Religion* he introduces the possibility that science and religion might cooperate in the formation of "a new and powerful faith" that would provide "a new basis for hope and confidence in the future." This faith would be a kind of myth concerning "evolution regarded as purposive cause and as a determinant of cosmic destiny" (*SR,* pp. 223–25). As Schilling sees it, science and Christianity are both committed to cosmic stories that are remarkably alike and that reenforce one another in important ways. The scientific one presents us with an "over-all picture of 'development' " that is "a rather impressive one, not only in magnitude and splendor, but also in direction": "The development from elementary particles to atoms, to molecules, to molecular chains endowed with life, to cells and microorganisms, to large plants and animals, and finally to man and social structures, has been seen as an upward tendency, from bare simplicity toward rich complexity, increasing organizations, mutuality, and self-consciousness; from individual to group, to community, to civilization. While many have not interpreted this process as having a goal and purpose, others have—and what is more, they regard it as a good goal and purpose" (*SR,* p. 227). The Christian version also deals with "a mythos, in the sense of a pattern of meaning and valuations having to do with the origin, nature and destiny of man, namely the biblical Judaeo-Christian story. It too sees purpose in the cosmos, and progress toward a goal; from a dark earth 'without form and void' to light and matter, to life, to human spirit, and to a new earth and holy city (community)" (*SR,* p. 228).

If this fusion of scientific matter and biblical themes is acceptable, it represents a more direct and positive interaction between science and religion than we have considered so far. In *Science and Religion* it is offered in a tentative way, but in *New Consciousness in Science and Religion* it becomes a major thesis and proposal warranting our careful attention.

Purposive Evolution as a World View

In *New Consciousness in Science and Religion* Schilling develops with boldness and enthusiasm the thesis that the cosmic evolutionary process reveals a benign direction and goal. The book, evidently conceived in the sixties, is full of allusions to flower children and consciousness III that now seem sadly dated. (*NC,* pp. 33–35, 266). However, Schilling's own irrepressible optimism about the future of man is rather based on his deeply felt appropriation of themes

derived from process theology and a very positive estimation of the scientific enterprise. The pronounced influence of Teilhard de Chardin is also very evident in his discussion.

To do justice to Schilling's essay it must be noted that the theme of purposive evolution is only part, though an important one, of his discussion. His general purpose is to sketch the shifts in paradigms and models that have taken place in twentieth-century science and their influence on a change in world view. Schilling's brief but insightful summaries of the results of recent scientific explorations are one of the most valuable aspects of his book.

It is by now generally agreed that the twentieth century has witnessed a scientific revolution similar to that which took place in the sixteenth and seventeenth centuries. Herbert Butterfield has described how the Newtonian breakthrough involved "fundamental changes in outlook," "remarkable turns in the current intellectual fashion," a "subtle . . . alteration in men's feelings for things" and "for matter itself," and awareness of a "new texture of experience" (quoted in *NC,* p. 19).

It is now clear that the Newtonian paradigm, with its billiard ball imagery, its mechanical model of a machine with externally interacting parts, has broken down or at least lost its place as the ruling metaphor conveying explanatory power for all aspects of reality. On the contrary, Heisenberg's uncertainty principle, quantum physics with its wave-particle tensions, and the proliferation of elementary particles to the extent where a coherent theory encompassing them all falters have deposed the Newtonian model from its place of prominence and relegated it to a still important but more limited status in the scientific enterprise.

This change has involved a profound shock to the complacency of nineteenth-century science. Schilling refers to a paragraph in the catalog of the University of Chicago, 1898–99: "While it is never sage to affirm that the future of Physical Science has no marvels in store more astonishing than those of the past, it seems probable that most of the grand underlying principles have been firmly established and that further advances are to be sought chiefly in the rigorous application of these principles to all the phenomena which come under our notice" (*NC,* p. 45). The passage seems curious and quaint in the light of our present scientific world that includes X rays, radium, atomic energy, the uncertainty principle, the wave-particle tensions of physics, elementary particles, an expanding universe, and black holes.

Schilling argues that many of the changes taking place in both physical and life sciences involve a transition from substantial and entitative categories to those of process and event. He summarizes the change from Newtonian to post-Newtonian science as follows: "According to the former view the world was closed, essentially completed and unchanging, basically substantive, simple and shallow, and fundamentally unmysterious—a rigidly programmed machine. The second regards it increasingly as unbounded, uncompleted and changing, still becoming, basically relational and complex, with great depth, unlimited qualitative variety, and truly mysterious—a restless, vibrant, living, growing organism forever pregnant with possibilities for novel emergences and developments in the future" (*NC,* p. 44).

It should be noted that in this statement we do not have a universe with a preferred direction but a cosmos "with qualitative variety" and "pregnant with "possibilities." It is a restless process without a single, clearly defined goal but with many directions, levels, dimensions so that meaning, purpose, direc-

tion are many faceted and no one strand can be singled out as the key to the rest. The community of man and consciousness itself are natural aspects of the process and have their rightful place within its dynamics. However, the process as a whole is "truly mysterious."

Now let us compare this description with Schilling's more specific thesis that the process reveals a direction and goal. He writes: "It . . . seems clear to numerous scientists that there *is* something systematic in the flow of its major events, a definite trend in the long-range sequence of emergences. . . . This trend would seem to be precisely the kind that would prevail if deliberate benevolent purpose were operative, for it follows an evident pattern of development, toward a richer, more unified, and more meaningful existence" (*NC*, p. 138).

In another place, Schilling refers to "the *teleological* purposiveness in the overall scheme of things, as well as in some of its detailed features. . . . the effluence and becomingness of reality has a preferred direction, indicating a cosmic pressure toward richer and more varied existence; i.e., toward increased possibilities for actualization of novelty in the future, toward enhanced interdependence, mutuality, community, and 'goodness' " (*NC*, p. 272).

These statements of the theme of purposive evolution should be distinguished from the more general affirmation of the cosmos as a complex, many-stranded process. In many ways the latter is a more viable one than the former. The purposive evolution thesis has many difficulties which it is worth considering. The critical issue revolves around the reference to a "definite trend," a "preferred direction," "a deliberate benevolent purpose" discerned in cosmic processes. On what basis can such a claim be made?

Let us first consider the kind of thesis with which we are dealing. Schilling makes it clear that the theme of purposive evolution is different in logical type from a scientific theory in the strict sense. Scientific evolutionary theories specify the particular dynamics of how physical change actually takes place, whether it is the molecular transformations comprising the history of stars or genetic shifts that determine the development of various species of organic life. These scientific theories do not require for their own purposes the category of a single preferred direction; stellar evolution describes how stars with planetary systems develop; biological evolution gives an account of how biological forms have emerged on earth and then fanned out in an ever-shifting set of interacting lines of change. The scientist discloses the mechanics of these changes through reference to environmental challenges mediated by natural selection. That any of these changes has a preferred status or is especially favored by the process is not an integral part of the theory itself.[9]

Schilling is aware of this obvious point and readily characterizes his position as a "world view" based on extrapolation from scientific resources but not, strictly speaking, itself a scientific statement. A world view is a symbolic construct that defines the ethos of a given society through a set of interacting myths, images, metaphors, paradigms. This category is important since it might serve as the mediating principle between science and religion and the locus where positive interaction between the two takes place. In a technological society like our own, where both science and religion are powerful social forces, it would seem reasonable to construct a world view of this kind out of materials taken from both "communities." Models from science might interact with the myths and stories of religion to form a complex paradigm as

overview for our culture. Schilling clearly is proposing that the theme of purposive evolution is formed in such a manner to serve as the symbolic focus of value and aspiration in our contemporary world.

However, Schilling does not make clear the logical status of purposive evolution as world view. For example, is this theme a descriptive response to an already present and irresistible fact of our consciousness? Schilling frequently suggests that such is the case. In *Science and Religion* he associates purposive evolution with what he calls "preconceptual foundations." These are basic assumptions like "You and I, others like us, and the world about us, exist" or "Nature is real, orderly, and, in principle, predictable." Similarly, religion assumes that "there exists a realm of ultimacy, mystery, and the holy." Schilling calls these kinds of postulates "predispositions, preconceptions, instinctive beliefs and postulates" (*SR,* p. 205). They are not propositions subject to explict validation but are rather the semantic matrix in which our more specific judgments are developed. Schilling thus refers to a faith element in the relation between the scientist or religionist and such presuppositions. However, even if we accept the validity of these foundational themes, it is doubtful that purposive evolution would count as one of them. It is too specific a thesis and appears more like a proposition made within the conceptual framework of either scientific or religious discourse than a part of the preconceptual foundation of either one. Furthermore, it is obvious that while the thesis of purposive evolution is entertained in some quarters it is not universally or even widely held. Probably the majority of scientists do not claim it as a legitimate part of their deliberations; similarly, in Christian circles probably only a few identify their eschatological hope with a cosmic direction occurring within time. This is not to argue for its truth or falsity on the basis of numbers but simply to observe that it can hardly be treated as a presupposition of our thought or a fact of our present social consciousness.

Schilling is on firmer ground when he treats his thesis as a proposal to be consciously adopted after proper deliberation. Here Schilling admits that "there is no way to 'prove' that the basic pattern is or is not 'for good' or, for that matter, that there is an overall pattern at all" (*NC,* p. 200). The capacity to "see" the pattern depends on a variety of judgments based on our knowledge, our faith commitments, our personal response to the deliveries of experience. He suggests that while arguments in this realm do not depend solely on logic and experiment they still deal with issues that can be discussed and argued about in meaningful fashion (*NC,* pp. 199–204).

It is no doubt from such a vantage point that we should consider the proposal that the universe reveals a cosmic purpose and direction. It is neither an assured conclusion of scientific investigation or an incontrovertible delivery of biblical faith. Yet suggestions from both areas might point to a world model that captures our attention and focuses our concern. But such a symbolic form is to be not blindly accepted but critically examined. Constructive models and creative myths need to be distinguished from idols of the mind. Here it is not so much logical rigor that is needed as a thoughtful estimation of how well or poorly a given world view helps us to do justice to the implications of our individual and social experience.

If we approach the theme of purposive evolution from this perspective, we will find many reasons for hesitation. It is not a matter of a logical refutation of the position but a recognition of ways that it obscures rather than facilitates our relation as human beings to the natural and social processes in which we

live.The difficulties rest mainly on the radically anthropocentric focus of this proposal. This point is so important it warrants our futher attention.

Purposive Evolution and Anthropocentrism

The thesis of purposive evolution as a possible world view must give us pause because its undue anthropocentric orientation distorts that part of our response to the world that recognizes in it a transhuman dimension. Of course, in one sense all of our experience and its symbolic expression are infected with an anthropomorphic aspect since our symbols—even abstract ones like those of logic and mathematics—are products of the human mind. However, the valid insight that our knowledge is, by definition, human knowledge and hence anthropomorphic should be distinguished from the tenet that all aspects of nature and world are directed toward man as their crown and goal. This latter we may characterize as anthropocentric. Though all our statements must be anthropomorphic, they may or may not be anthropocentric as well.

The problem with the thesis of purposive evolution is that it unduly focuses on man and thereby does violence to the recognition common to science and many religions of ways in which the universe transcends our human purposes and goals. Schilling is aware of this transhuman dimension, and we shall see in the concluding section that he makes many references to it. Nevertheless, his enthusiasm for a Teilhardian kind of evolutionary goal causes him to obscure many of his own best insights. The anthropocentric bias is at its strongest when Schilling identifies the forward thrust of the evolutionary direction with the emergence of a world community on earth. In this vein community, love, interdependence, mutuality, goodness are hailed as the imminent issue of a "cosmic pressure."

Furthermore, the appearance of an alleged "new consciousness" in man is celebrated as evidence of this evolutionary breakthrough. Thus Schilling begins his book in an oracular mode: "Something is happening to man that is so momentous as to constitute a major emergence in his evolution. He is experiencing a tremendous expansion and transformation of his consciousness—and thus becoming a being with a new mentality" (*NC*, p. 17).

The theme of a "new consciousness"—a part of the title of his book—is obviously important to Schilling. Sometimes it is used to refer to change in models and metaphors such as have taken place in the transition from modern to postmodern science. Unfortunately, Schilling then confuses this acceptable meaning with the suggestion of counterculture spokesmen and Teilhard de Chardin that some sort of ontogenetic transformation of the mental, psychic, and spiritual capacities of the individual members of the human species is in progress. In this vein we might suppose that twentieth-century man is undergoing an actual growth in his intellectual abilities, an emergence of unusual powers (ESP), an increase in his capacity to love, perhaps new capabilities to transcend greed, egoism, and self-centeredness. Teilhard refers to "our power of love developing until it embraces the total of men and of the earth." Similarly, Schilling characterizes as a promising development "the great capacity for love that has come to men" (*NC*, pp. 168, 171).

The point at issue is whether a radical change of this kind is in fact evident at the present time. A capacity for love is of course a part of man's makeup, as is his capacity for hate and destruction. However, a quantum leap to some

higher consciousness through which man is able to deal in a more constructive way with his passions is not yet evident. Violence, exploitation, and death remain relentless truths of our social world. The twentieth century has witnessed, in terms of numbers alone, more man-made death, torture, genocide than ever before in history.[10] An ontogenetic change in consciousness seems more a utopian projection than a present actuality. In fact, the critical dilemma of our time lies precisely in the fact that while incredible technological and societal changes are taking place the consciousness of the individual—that is, his habitual way of perceiving the world and relating to others—remains very much what it has been for the last ten thousand years. Of course, our consciousness is changing in all sorts of ways as we face new problems. However, the delusive lure of a radical change of consciousness gives us the false sense of an easy and automatic solution to our perplexities. The fact of the matter is that hard work making use of our old consciousness is probably the best we can manage at present.

It might seem as if Schilling has forestalled such demurrers as these since he frequently insists that he is not arguing for a kind of inevitable progress toward greater good on the part of man: "Nature in no way guarantees any particular outcome—even though its long-range trend has been upward in direction" (*NC,* p. 147). Furthermore, Schilling readily acknowledges the destructive propensities of technological man: "the retaliatory slaughter of innocent men, women, and children in total war, the calculated savagery of the Buchenwalds, and the inhumane customs of slavery and racial discrimination" (*NC,* p. 146). He points out that "the evidence is mounting that man's capacity and predilection for demonic savagery surpasses by far anything observable elsewhere in nature, say among the animals." He admits, "It is clear that man's wisdom has not yet evolved to great heights of profundity, certainly not so far as to assure a utopian future for him with certainty" (*NC,* p. 146).

In spite of these grim acknowledgments, Schilling's thought is informed by millennial hope. Most apocalyptic scenarios include the emergence of great evil in man as a penultimate phenomenon just before the final transformation of the world into a new heaven and earth. Schilling's is no exception, and his warnings about danger are used to support the conviction that a time of radical transformation is at hand. Thus Schilling declares, "There is an expectation among many thoughtful men that we are now in a period of momentous evolutionary transition from the era of men to that of man" (*NC,* p. 171).

Schilling develops this theme of the community of man with a dubious use of social and organic metaphors. He suggests that the next emergence in the evolutionary process will include "humanity as an organic whole, as distinguished from humanity as simply an aggregation of many individuals." In this vision, individual human beings will "constitute a new entity, much as molecules join to constitute a crystal, or as they are aggregated, organized, and integrated into a living organism" (*NC,* p. 164). There seems to be here systematic ambiguity in the use of the terms society and community.

Schilling (following Teilhard) points to the importance of the social paradigm throughout nature. Thus molecules and cells are societies of a kind, and man is a social animal who lives in various kinds of groups. Family units are based on biological ties, while cities, states, and nations have their foundation in a variety of human needs. However, the noun "community"

(and the adjective "communal" even more so) has connotations for Schilling of a different sort. Here the emphasis is on human affection and love as the permeating influence that binds an aggregate of individuals into a creative whole (*NC,* pp. 138, 272). Now the inhabitants of earth do seem to be creating a tightly integrated social structure; even if a world government does not emerge, the various nations will be so closely connected through technological and economic factors that we can agree with Schilling that they will be "aggregated, organized, and integrated into a living organism" (*NC,* p. 164). But do any of these terms necessarily characterize a communitas of love and brotherhood? By obscuring the difference between "integrated society" and "community," Schilling makes it appear that all evidence for the former is also evidence for the latter.

Schilling proceeds to note three signs of the time that are harbingers of the coming community. First is the technological assembling or aggregating of men to form "one world"; second is the means provided by "science and technology" for man to transform human existence; third are "other flowerings of the human spirit" like "the great capacity for love," "genuine mutual understanding," and "a growing sense of moral responsibility" (*NC,* p. 171).

Doubts about the actuality of the third sign have already been noted. What about the other two, which emphasize technology as the foundation for a community of man? The problem with them is that they sacralize and legitimize the very social processes that ought to be the target of critical doubt and skeptical probes. To present them as part of an "evolutionary transition" is to say too much or too little. It is too little if all that is meant is the tautology that since man is clearly part of an evolutionary process whatever events occur in his history are part of that process. It is too much if what is claimed is that man's specific commitment to a radical technologization of his society and environment is to conform to a direction favored and supported by the evolutionary process itself. If we then further identify the integration of the technological world with the communal interaction of the City of God, it turns out that science and religion unite to provide an ultimate sanction to our present social world.

The investiture of the present human situation with cosmic and divine value is questionable. Of course, the nations of the world are in the midst of great cultural and economic changes that bring with them fear of the unknown but also hope that new possibilities can be liberated from the fetters of old patterns. So far these possibilities do not really point to some sort of quantum leap onto a radically different mode of existence. The exhilaration and bewilderment we feel before violent social upheavals should not be identified with the actual presence of an imminent apocalyptic transformation.

Realistic hope must be distinguished from the millennial expectation that we have immediate access to some final solution to our dilemmas. The scenarios devised by futurologists are a mixed bag. At the moment the visions of utopian technologists that man is about to create a humane world in which he is in charge of his own evolution are countered by the more somber projections of others, who extrapolate from present perplexities to a future of reduced expectations and less political freedom for the mass of mankind. Our predicament requires realistic assessments of the possibilites implicit in the situation, not a celebration of it as already part of some salvific process in which technology and religious faith lie down together like the traditional lion and lamb.

This theme of technological evolution seems directed toward the wrong problem, as if man were fascinated by some cloistered virtue and needed to be aroused to a recognition of the values of secular life. In fact, the religionists with an other-worldly orientation are few in number, and the majority of mankind is obviously committed to a social world based on technological invention. If the truth of religion is simply the truth of the secular city, it seems to be superfluous. Such positions make undue use of the priestly functions of religion which sacralize human activity and neglect the prophetic functions that might criticize it from another perspective. Thus Schilling does not consider whether religion or some forms of religion might offer an alternative to the brave new world we are making or at least develop a dimension within it that would provide an escape from banality and oppression. Instead, religion becomes an uncritical ally of technology and provides it with a moral support that, in this period of its undisputed ascendancy, it hardly needs. Man, with or without a legitimizing world view, is committed to the development of a complexly integrated world society. He needs specific insight into ways of dealing with his circumstance; he also needs symbols and metaphors that will alert him to unsuspected possibilities in his self and his society. It is here that religion might be of authentic service.

Cosmic Process and Mystery

In justice to Schilling's position it must be noted that the anthropocentric emphasis is balanced by a recognition of aspects of the natural process that are either indifferent to human concerns or inimical to them. Schilling discusses with awareness the presence of natural misfortune (disease and flood) and human evil (inhumanity and cruelty by man to man). He also refers to aspects of nature that, while beautiful, are remote from human cares. At times, Schilling notes that man should not think of himself as the apex of the evolutionary push but as a stage in that which eventually will transcend his own narrow boundaries. In one eloquent passage Schilling refers to the "*mystery of large perspectives and relationships, of multiple causality, and of tangled realities.* The recognition of this represents a significant expansion of human consciousness. Instead of leading to excessive anxiety and preoccupation with one's self, it tends to focus concern upon broader values and cosmic trends or 'purposes.' And it demands that nonhuman beings of nature, e.g., the sparrow, the daisy, the brook, and the wind, be accepted by man with understanding and genuine fellow feeling (Mitgefühl) as full-fledged co-members of the community we call nature" (*NC,* pp. 143–44). This is a fine passage, which could be improved by adding to humanly pleasant phenomena like "the brook, and the wind" such factors as hurricane, earthquake, and pestilence as "co-members of the community we call nature."

In this vein Schilling is really supporting a view of nature as a dynamic affair—"mysterious," "vibrant," "pregnant with possibilities"—in place of the more dubious evolutionary process moving toward the community of man. Still, even when Schilling attempts to develop a world view without radically anthropocentric features, his effort is marred by his insistence that the universe has a direction toward good and his further explication of good in terms that are unduly sentimental and man centered. From process theology Schilling develops the theme that God as a continuing creative activity is at work in the world through persuasion rather than force. This God is Lord of tender relationships and gentle love. Schilling cites as an example the flower children

of consciousness III who espouse nonviolence and peace (*NC*, pp. 212, 232). The problem here is not Schilling's espousal of the human value of tenderness but his claim that both biblical faith and science support these values as the evolutionary direction and the center of the natural universe. "As we have seen, it is fundamental to process thought that love, sensitivity, and tenderness are the potent forces of the cosmos, and operative internally at the core of all occasions" (*NC*, p. 255).

There is an element of truth in this position that is important. The universe does reveal the kind of process in which life and mind are natural occurrences. Often, popular statements of evolutionary theory have described the emergence of life as a fortuitous affair that happened once on earth by some kind of unprecedented accident—a chance collocation of molecules—that is not likely to occur ever again. The impression is that lifeless matter is the "natural" state of the universe and life an intrusion. More recent statements suggest that it is a "natural" thing for life and, indeed, for consciousness to emerge in the creative matrix of a universe of many—perhaps infinite—levels. In this sense man has become naturalized and more at home in the universe in which he lives and moves and has his being (*NC*, pp. 141–47, 129–31).

However, the fact that man is an integral part of the evolutionary process does not mean that his values have some kind of preferred status within that process. Natural processes both support and destroy the conditions in which human values are realized. There are manifestations of natural force and energy which disclose a benign indifference to human concerns. To insist that a scientific view of nature shows that these transhuman aspects are subordinated to human values of love and tenderness seems to falsify our commonsense experience of what the universe is really like (*NC*, pp. 167–72, 209–15). Schilling argues that the cosmic scheme of things itself provides the normative model for human life. "Since the universe operates for good . . . human life should be lived in harmony with the basic characteristics and mode of operation of nature" (*NC*, p. 229). This seems to offer us an ideological canopy under which we can feel safe in a cozy universe fundamentally like ourselves.

Interestingly enough, there are motifs in both science and religion that resist such simplifications. Science has a dual aspect, uniting both humanistic and transhuman orientations. On the one hand, it is an awesome human achievement through which the universe reveals an order that can be understood by the human mind. On the other hand, science has required the sacrifice of animistic myths and the subordination of private wishes to the inexorable necessity of objective fact. To return to our earlier distinction: Although science is anthropomorphic in its use of human symbols, it surrenders its anthropocentricism to recognition of a universe existing independent of human wishes.

Similarly, the great religions contain symbols that orient us toward the transhuman mystery of things as well as toward the sources that support human aspirations. If Vishnu is the lover and supporter of man, Shiva is the implacable destroyer. The biblical God is concerned with man, but he also has purposes that transcend the human level. His appearance before Job has always offended humanists and religionists who believe that strictly human categories must determine the scale of all things human, natural, or divine. In sublime disregard of such demands, the mysterious Lord presents to Job a

hierophany of natural phenomena that transcend the human dimension of things. However, the recognition of this aspect of things does not necessarily intimidate the human consciousness into mindless submission. It can purify the mind of banal self-absorption and liberate the spirit for a more enlightened engagement with the way of a world that is both beautiful and terrible to confront.

Probably some sort of complementary model is needed to do justice to the themes of transhuman and humanistic aspects of nature. Recognition of the transhuman alone can be overwhelming and destructive; focus on the human alone can be misleading and an exercise in self-deception. If the two are maintained in some kind of creative tension, wholeness and wisdom may ensue.

Recognition of the transhuman aspect of nature does not undermine human values unless we mistakenly think we are supposed to conform to the parts of nature beyond our understanding instead of developing potentialities in the parts that we do. We love because it is human to love, and in doing so we are taking direction from biological and psychic aspects of our particular mode of natural being; we also respect the mystery of a universe more complex and wonderful than our minds can conceive.

The most intriguing part of Schilling's book lies in his development of aspects of the postmodern science of the twentieth century that point to this dimension of the transhuman. Schilling here introduces the very problematic category of mystery and insists that science as well as religion is becoming aware of this quality. There are two main senses in which the term is used. One refers to a sense of wonder in the manifestations of nature that remains even after the scientific aspects have been understood completely. Thus the rainbow, the laughter of a child, the mind of man can involve mystery in that sense (*NC,* pp. 30–32).

However, Schilling gives to the term another meaning and argues that an apparently unfathomable quality is now becoming evident in present-day scientific knowledge. It is not that we do not at the moment know enough. It is rather that the more we learn, the greater is the complexity of the subject matter and the greater the number of new questions and problems that are raised. It is possible that reality may be literally unfathomable; this is to say, although our knowledge is genuine and accurate, we will never reach a point where we have understood all its dimensions and ramifications in some final and complete scientific theory. On the contrary, it may be, as a colleague told Schilling: "What is known about nature does not subtract from the total of what is not known. . . . every answer to a question about nature gives rise to more questions, and the answer to each of these to still others, and so on in a diverging series of more and more questions" (*NC,* p. 117).

Schilling unites the notion of unfathomable mystery to the model of a "bootstrap universe" in which the search for a foundation or ultimate aspect on which everything rests is abandoned. Instead of looking for a "rock bottom" level, we consider nature as "a cybernetic network of circuits, or an organism, or a society of things, relationships, events, and process—more like a delicate fabric than an edifice of brick and mortar" (*NC,* pp. 113–14). Furthermore, the intricate network might be infinite and unbounded. On this view, nature is an intricate interaction of levels and dimensions which do not necessarily have a first or last term that is the originating base or an ultimate apex toward which everything moves.

The bootstrap model is, of course, a controversial one that may represent only a stage of present ignorance, to be followed soon by a more nearly complete theory providing a foundation to our knowledge. For the present, however, it serves as a fitting symbol for an orientation of openness that is perhaps our most desirable stance in both science and religion. It is disappointing that after a sprightly discussion on the universe without foundation Schilling ignores it so far as his biblical faith is concerned and refers conventionally to "ultimate concern" and an "ultimate quality" of the universe (*NC*, pp. 181–84). It would be interesting to see if a more radical theological statement could be fashioned with an "unfathomable bootstrap" model. At the very least, it ought to make us suspicious of approaches that too easily discern the cosmic purpose in events and processes that are incredibly complex.

Schilling does hold that the universe is a great creative process with levels and hierarchical structures that extend beyond man and are beyond his control. But this insight probably will lead to a more radical reworking of Christian theology than Schilling has suggested. In his presentation the divine purpose of the cosmos is too easily identified or integrally associated with the activities of the present technological culture. There is not sufficient recognition of the possibility that religion—Christianity and other forms—might open up levels and hierarchies of concern that are only dimly suspected in our pragmatic civilization. As Jacob Needleman puts it in his comparable discussion of the same issues, this time of creative ferment between science and religion is like a moment "between dreams." He points out: "The real question of the moment between dreams is whether we can bear the vibration of this new feeling of the unknown which carries with it the taste of a different quality of intelligence, but which at the same time utterly exposes all our illusions about ourselves. We awaken to darkness."[11] A note of this kind is needed to disenchant ourselves from the spell of a hubristic preoccupation with our knowledge and our tools.

In spite of the reservations we have noted, Schilling's two studies of the relation between science and religion do make a genuine contribution to our contemporary explorations. The direct and unambiguous style is a virtue, and the boldness with which various positions are stated and defended is commendable. The main difficulty with the argument is probably endemic to the Western philosophical and religious tradition itself. Platonic thinkers and Christian theologians alike have espoused a teleological conception of a universe that has been denied by atomists and materialists. Schilling's studies (like Teilhard's) are latter-day attempts to reactivate this tradition and to establish purpose and goal within the universe. However, it would seem that at present we must rather submit to a discipline in which our desire for telos is frustrated and we learn to live with unfathomable possibilities. Christian faith still will possess vitality when oriented toward a purpose of its own different from that of the cosmos; science will continue to explore nature's labyrinth even if it never seems to reach the final path out of the maze. It may be that Western man cannot abandon all hope that some ultimate key and final telos will be forthcoming. The hints in the religious myths of many traditions suggest, however, that when attained it will assume the shape of a surprise.

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NOTES

1. The two works by Harold Schilling representative of this new interest are *Science and Religion* (New York: Charles Scribner's Sons, 1962), hereinafter cited as *SR*, and *The New Consciousness in Science and Religion* (Philadelphia: Pilgrim Press, 1973), hereinafter cited as *NC*. In these works the religious interest is focused on Christianity. Ian Barbour has written extensively in this field. His *Myths, Models and Paradigms* (New York: Harper & Row, 1974) is a fine methodological statement of his position. Both Schilling and Barbour, while having a genuine respect for religious pluralism, focus their attention on Christianity, and both are influenced by process theology. Fritjof Capra, on the other hand, explores parallels between modern physics and "Eastern mysticism" in *The Tao of Physics* (Berkeley: Shambhala Publications, 1975). Jacob Needleman juxtaposes modern science with esoteric traditions from archaic as well as contemporary civilizations in *A Sense of Cosmos: The Encounter of Modern Science and Ancient Truth* (New York: Doubleday & Co., 1975).

2. W. J. Thompson, *At the Edge of History* (New York: Harper & Row, 1971), chap. 6.

3. "The Advancement of Learning," in *Selected Writings of Francis Bacon,* ed. H. Dick (New York: Modern Library, 1955), p. 165.

4. W. T. Stace, *Religion and the Modern Mind* (New York: J. B. Lippincott Co., 1952), p. 274.

5. As quoted in W. Donald Hudson's *Wittgenstein and Religious Belief* (London: Macmillan Press, 1975), p. 155.

6. J. D. Bernal makes the same point as Schilling from a Marxist perspective: "Science as an institution in which hundreds of thousands of men and women find their profession is a very recent development" (*The Emergence of Science,* Science in History, vol. 1 [Cambridge, Mass.: M.I.T. Press, 1971], p. 32).

7. Niels Bohr, *Essays 1958–1962 on Atomic Physics and Human Knowledge* (New York: Vintage Books, 1966), p. 4.

8. Ibid., p. 10. Cf.: ". . . any account of experience even in atomic physics must ultimately rest on the use of the concepts indispensible for a conscious recording of sense impressions" (Niels Bohr, *Atomic Physics and Human Knowledge* [New York: John Wiley & Sons, 1958], p. 21).

9. The issue concerning the scientific status of "purpose" and "direction" in evolutionary theory is much debated. George Gaylord Simpson is a distinguished spokesman for the "synthetic theory" of evolution. This theory combines the original emphasis of Darwin in natural section with the more sophisticated awareness of genetic laws developed in this century. "We now define natural selection as differential reproduction. The basic idea is a simple one. It is clear that in every population, from amoeba to men and in all the rest, some individuals have more offspring than others, offspring that grow up and produce other offspring in their turn. If now the individuals that are thus more successful (or relatively prolific) in effective reproduction differ genetically, on an average and by however little, from the less successful individuals, their genetic characteristics will inevitably become more frequent in the genetic pool in the course of generations" (*This View of Life* [New York: Harcourt Brace & Co., 1947], pp. 76–77). Simpson rejects orthogenesis, i.e., evolution moving in a straightforward line. "But evolution is not really orthogenetic. Trends do not keep on indefinitely but level off, change direction or even become reversed. Valid predictions cannot be made by extrapolating a past trend into the future. As for man's brain, there is no evidence that it is now increasing in size" (ibid., p. 272). However, A. Tetry expresses the conviction that the synthetic theory of evolution is only a partial explanation of the evolutionary process ("Theories of Evolution," in *Larousse Science of Life* [Feltham, Middlesex: Hamlyn Publishing Group, 1971], p. 449). Some biologists, while not going as far as Teilhard, do see the emergence of mind and consciousness as a critical event in the evolutionary process. Julian Huxley writes, "I . . . envisaged human evolution and biological evolution as two phases of a single process, but separated by a 'critical point' "

(Introduction to Pierre Teilhard de Chardin's *The Phenomenon of Man* [New York: Harper & Row, Torchbooks, 1959], p. 11). Theodosius Dobzhansky writes, "To say that the origin of man has been the paramount achievement of the organic evolution is a legimate anthropocentricity, though it is going too far to suppose (as some writers have done) that the whole organic evolution was designed for the sole purpose of bringing man into being" ("Evolution: Implications for Religion," in *Changing Man: The Threat and the Promise,* ed. K. Haselden and P. Hefner [New York: Doubleday & Co., Anchor Books, 1969], p. 149). And "with the appearance of life, and again with the appearance of man, something quite novel entered the world. . . . I have called these turning points 'evolutionary transcendences' " (ibid., p. 151). However, these statements seem to be philosophical rather than scientific. Dobzhansky as scientist is firm in his rejection of vitalist theories and his adherence to the explanation of change based on natural selection and genetics. The theory of biological evolution is supplemented by evolutionary approaches in two other fields—astronomy and cultural anthropology. The development of stars based on molecular transformations is now a widely accepted part of cosmological theory. Thus "the life history of stars is part of the background of life because the activities of stars involves the condensation of primordial matter into the configurations of atoms, and particularly into the larger atoms that play so indispensable a role in the substance of living organisms" (C. Grobstein, *The Strategy of Life* [San Francisco: W. H. Freeman & Co., 1964], p. 20; cf. W. Kaufmann III, *Relativity and Cosmology* [New York: Harper & Row, 1973]). The status of evolutionary theory in cultural anthropology is more debatable but lately is seriously discussed. See "Panel Five: Social and Cultural Evolution," in *Evolution after Darwin,* ed. Sol Tax (Chicago: University of Chicago Press, 1960), pp. 207–41.

10. See Gil Eliot, *The Twentieth Century Book of the Dead* (New York: Ballantine Books, 1972).

11. Needleman, p. 4.

The Life of the Self: Toward a New Psychology. By Robert Jay Lifton. New York: Simon & Schuster, 1976. 190 pages. $7.95.

This brief volume tries to refine further some basic ideas which Robert Jay Lifton has been developing in his earlier writing. It is primarily a theoretical book, although it relies on some of the psychohistorical studies Lifton has done with Hiroshima survivors, victims of thought control, and returning Vietnam veterans. The book has an ambitious goal. It attempts to elaborate a new paradigm for psychoanalysis. It does not quibble about fine points in the theory and practice of traditional psychiatry and psychoanalysis but rather attempts to see the entire terrain of psychoanalysis from a new perspective.

Lifton refers to this new paradigm with the phrase "death and the continuity of life." By this Lifton means to suggest that human action is motivated by the deep and pervasive desire to maintain a connection with life in the face of the threat of death. Man's deepest wish is not for sexual release, not for pleasure, not for simple egoistic self-preservation, and not for homeostatic balance. Man's basic urge is for continuity with life through various forms of immortality.

Lifton sees human beings as symbol-creating creatures who project their thrust toward immortality and connectedness with life into various symbolic and mythical images and forms. Lifton's view is very biological; he believes his

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psychology is consistent with Darwinistic evolutionary theory. In fact, he claims that the major counters of this psychology are congruent with the sociobiology of E. O. Wilson. Lifton would see his paradigm as far more faithful to the best in current biological thinking than was the psychology of Freud, who generally is the modern psychologist most consistently charged with being biologistic. But at the same time that he considers himself more truly biological he also would consider himself more adequately emphasizing the symbol- and meaning-forming nature of man. Lifton bridges the gap between biology and symbolism with the proposition that it is precisely man's desire for connectedness and immortality that is projected into his most fundamental symbols and images. Hence he writes not so much about immortality as about "symbolic immortality" as the fundamental motivating force behind human behavior.

Lifton tries to demonstrate the novelty of this paradigm by contrasting it with the major model of human nature found in the theories of Freud and Erik Erikson. Freud's model of human nature dealt with sexuality and repression. Sexuality, understood as the drive toward sexual union, and the repression of sexuality—these, for Freud, were the major dynamics motivating human behavior. Lifton sees Erikson as closer to his own position. But there is still a difference. The major paradigm of human nature for Erikson was "identity and the life cycle." Erikson was a more configurational thinker than was Freud. He was less interested in biological energies and forces than in psychological meanings, configurations, and patterns. More than was Freud, he was interested in the total psychological situation, concerned about the relation of the individual to history, and aware of the influence the subjectivity of the investigator has on the subjectivity of the client or subject. Lifton applauds all these emphases in Erikson's writings. But even Erikson failed to thematize fully the importance of the human thrust toward connectedness and immortality in the face of the threat of death.

There is much to be commended in this book. First of all, Lifton's basic vision is a commanding one. As Lifton himself points out, there are possible links between his psychological theories and evolutionary thinking in general and sociobiology in particular. Furthermore, there are several psychological theorists who are close to the perspective Lifton is striving to develop. To this extent Lifton may be giving expression to an emerging new synthesis. Lifton himself lists "Rank, Adler, Jung, Fromm, Rado, Horney" and then adds for good measure people such as Ernest Becker, Norman Brown, and Erikson himself. I agree that the work of Erikson supports the direction of Lifton's new paradigm. In fact, I think that it is a weakness of Lifton's book that he fails to realize how much Erikson does indeed support his position. It is possible to say that Lifton has made only more explicit some themes that are very evident in Erikson's writings. The idea of symbolic immortality is very close to what Erikson means by "generativity" as the goal of mature adulthood. Furthermore, Erikson's concepts of the interlocking of the generations, basic trust, fidelity, and care all have overtones very close in meaning to Lifton's idea of symbolic immortality.

Although the general direction of the book is solid and to be emphatically encouraged, this present statement of Lifton's position is not sufficiently detailed and careful to be very convincing to his critics. A more careful theoretical discussion of both Freud and Erikson is needed as well as a more precise statement of his own position. For instance, there are dimensions of Freud's

thought which resonate with what Lifton is aiming toward. Freud in his later thought said much about eros as the general drive toward unification of life. The castration threat in the later Freud was understood less as a sexual threat than as a threat to the possibility of the young boy finding symbiotic union with the mother.

Lifton's paradigm has worked very convincingly with the extreme situations he has studied—the Hiroshima survivors, the returning veterans from Vietnam, the victims of psychologies of totalism. But to be persuasive to the professional psychiatric community Lifton will have to demonstrate the applicability of his paradigm to ordinary psychiatric syndromes such as hysteria, schizophrenia, obsessional neurosis, and phobias. In one of his chapters he attempts to do this. But his efforts are altogether too brief. Only a few who, like myself, are already sympathetic to his position will respond favorably to his arguments. Most likely the real skeptics have yet to be won.

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