

## Reviews

*Science, Ideology, and World View: Essays in the History of Evolutionary Ideas.* By JOHN C. GREENE. Berkeley: University of California Press, 1981. 202 pages. \$5.95 (paper).

For over twenty years John C. Greene has been one of the more dependable guides to the world of nineteenth-century evolutionism and to the intellectual developments that preceded and shaped that era. Reading these essays reminds one that he also has been and remains one of the most graceful writers in intellectual history and in the history of science. His book, *The Death of Adam: Evolution and Its Impact on Western Thought* (Ames: Iowa State University Press, 1959), which was one of the pioneering volumes in the new history of Darwin and evolution, has stood up to the inevitable challenges and revisions of subsequent scholarship better than most similar studies written around the centenary of Charles Darwin's *On the Origin of Species*. Another work by Greene, *Darwin and the Modern World View* (Baton Rouge: Louisiana State University Press, 1961), also possesses permanent value.

The work under review contains seven essays, three of which are printed for the first time. The first ("Science, Ideology, and World View") is a new, short introduction which states the thesis of the volume: that science, ideology, and world view are constantly interpenetrating and that pure science is an illusion. Science, important as it is, is only one of many roads to truth and reality. The second essay ("Objectives and Methods in Intellectual History") lays down prescriptions for writing intellectual history. The third ("The Kuhnian Paradigm and the Darwinian Revolution in Natural History") tests Thomas Kuhn's well-known theory of scientific change as it might apply to biology. Next, ("Biology and Social Theory in the Nineteenth Century: Auguste Comte and Herbert Spencer") the interplay of biology and sociology (or the lack of it) is analyzed. The fifth essay ("Darwin As a Social Evolutionist") dismisses the still prevalent idea that Darwin held aloof from social Darwinism. The last two, ("Darwinism As a World View" and "From Huxley to Huxley: Transformations in the Darwinian Credo") which are original here and which identify and trace the course of Darwinian scientism, old and new, will be of most interest to readers of *Zygon*. Each essay is followed by an up-to-date bibliography.

That a leading practitioner of intellectual history is still "satisfied" (p. ix) with a methodological essay written in 1957 might raise some eyebrows, but, on the other hand, it may say something about intellectual history: not so much that its method should by now have left views of the fifties far behind as that it has no easily identifiable method or approach. Greene's prescriptions for disclosing the world view or the preconceptions of thought of a particular age (whose world view, one might ask, and to what end?) will still find supporters, although perhaps they would be less confident of its sufficiency than when the essay was written. All friends of the discipline, however, will welcome and sympathize with his resistance to the still encountered dismissal of ideas as historical forces.

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What Greene seems less attuned to is that ideas are making a comeback as mere strategies in social conflict, a guise some find as lopsided as the older dismissal. In fairness, though, present-day revisionists might find in these essays reason to think that their revisions are not, in essence, as novel as they think; further, there is in Greene's work a balance that they should not ignore.

A more serious *caveat* cannot be passed over. Greene, like so many who study group thought, tends to assume that collective world views adequately account for the ideas of individuals, a procedure that only begs the question of independent or original thought. It also tempts one to dispense with the search for evidence in individual cases. A case in point is Greene's favorite and often used example of the connection between British competitive political economy and Darwinian selection. Was natural selection a peculiarly British way of looking at nature? Setting aside the questions of whether British economic writers of the 1830s spoke for Britons generally, whether their doctrines of competition really resembled the Darwinian formula, and whether the handful of selectionists all read and were influenced significantly by the economists more than other sources, one must in the end face a paradox. If a collective competitive national mentality gave rise to Darwinian natural selection, why did Britons (even scientific ones) find it so hard to understand and why did they reject it so overwhelmingly? Can Greene escape the paradox by any means short of admitting such a diverse mental life in Britain that it can only destroy the premise of a uniform national outlook? Similarly, if German idealism made German naturalists *Naturphilosophen*, just as British political economy made British naturalists selectionists, why did the Germans embrace Darwinism more willingly than the British? What is contested here is not so much the thesis, which remains intriguingly plausible, but the mode of argument which rests on affinities rather than evidence. Even an association so likely on the surface as competition and natural selection is incredibly complex and, especially on the level of individual thought, requires closer analysis than is allowed for in the delineation and matching of abstract world views.

Greene's essay on the Kuhnian status of the Darwinian revolution in biology will deservedly remain one of the classic tests of Kuhn's thesis. While one must grant the fundamental rightness of Greene's scepticism about the ability of Kuhn's formula to deal completely with the diversities of pre-Darwinian natural history, in view of recent scholarship it seems certain that there was more unease among naturalists in the early nineteenth century about the state of their science than Greene allows and that more can be done heuristically with Kuhn's model than Greene indicates. Greene's sense that the more important preparation for Darwin's revolution was in the realm of general ideas about nature and the proper scientific approach to nature and not in the narrower technical operations of taxonomic natural history, however, is surely correct.

Of all the reprinted essays, the one on Darwin as a social evolutionist is the most compelling. It gives us a close study of Darwin's reading and thinking during the 1860s on questions relating to natural selection and human social evolution showing how derivative his social thought was and yet how carefully he sifted the knowledge and opinions of others.

In the first of the last two essays Greene takes the ground that the suffix "ism" should refer to the "general views of reality (natural or social) connected with scientific theories instead of being used to denote the theories themselves" (p. 130) and outlines a world view arrived at "more or less independently" by Thomas Henry Huxley, Spencer, Darwin, and Alfred Russel Wallace around

1860 even though they subsequently moved away from it in various directions. There were five elements in this world view: (1) nature was seen as "a law bound system of matter in motion"; (2) organic evolution was thought to have proceeded from simple forms to complex ones including man within this system; (3) the "competitive ethos" of laissez-faire political economy was affirmed; (4) society was believed to be governed by progressive laws analogous to those of nature; and (5) a positivistic empiricism held science to be the only genuine form of knowledge (pp. 130-32). As a philosopher Spencer was the grand architect of this world view, but Darwin, Huxley, and Wallace all shared its assumptions and conclusions.

One may feel compelled to agree with Ernst Mayr (whose criticisms are included) that Greene's insistence on calling this world view and nothing else Darwinism—not even selectionist evolution theory (pp. 151-52)—is somewhat extreme. Delineating the world view is important, but whether it is called Darwinism, Spencerism, or whatever seems less so. Also, it is not clear in this essay whether "Darwinism" is a title bestowed by Greene (pp. 130, 148) or by history (pp. 130, 154). How can the intellectual historian discover the original senses of the term "Darwinism" (p. 154) when he is himself specifying the content of the term (p. 148)?

The last essay sketches the Darwinian world view that has accompanied the triumph of Darwinian evolution in the current synthetic theory. Greene finds this world view in the biological-ethical writings of scientists such as Sir Julian Huxley, G. G. Simpson, Cyril Darlington, E. O. Wilson and others. He calls these writings the Bridgewater Treatises of the twentieth century (p. 163); they seek in evolution answers to the mysteries of human existence as well as a moral guide for human life. What lessons have these men found in science? None that Greene can accept. He thinks their naturalism is devoid of "aim, purpose, creative ground" (p. 165) and their celebration of human values paradoxical in a universe which they declare to have no inherent value. He finds their views lacking in intelligibility, but since he holds them to his own definitions of the intelligible and does not explore theirs, this is not surprising. Such philosophical tail-chasing is inevitable in clashes of incompatible world views. Bearing a double burden of explication and refutation, Greene's final essay lacks the deeper analysis prescribed in his second. Beyond the suggestion of residual cultural values—they must find in science a substitute for discredited religion (pp. 174-75)—and a hint at an ideological defense of science itself (p. 177), Greene does not unpack the paradoxes he discovers. Granted that these naive Darwinian writings may not tell us much about ethics and metaphysics, they still could tell us quite a bit about twentieth-century Anglo-American scientific ideologues as social beings in the broadest sense. It is ironic that Greene, an historian of evolution, in a short postscript (p. 194) seems to see his historian's task as one which might be encompassed in classical taxonomic metaphor: *nommer, classer, et decrire*. But, surely, after Darwin, to say nothing of Karl Marx, Max Weber, Sigmund Freud and others, historians should intend more than that.

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*The Evolutionary Vision: Toward a Unifying Paradigm of Physical, Biological, and Sociocultural Evolution.* Edited by ERICH JANTSCH. Boulder, Colo.: Westview Press, 1981. 200 pages. \$21.50.

The topic of the book is best described by a brief introductory heading offered by the editor:

"The evolutionary vision" is a term coined by economist Kenneth E. Boulding to describe a unified view of evolution that encompasses all levels of reality, from the cosmic or physical through the biological, ecological, and sociobiological to the sociocultural. It focuses less on systems or any particular entity than on the processes through which they evolve. The scientific foundations for such a sweeping view became visible in the 1970s with the emergence of a comprehensive self-organization paradigm. Concepts such as dissipative structures, synergetics, autopoiesis, hypercycles, and catastrophe theory furthered an understanding of evolution as an aspect of dissipative self-organization underlying the generation of complexity and variety at many levels. . . . The resulting transdisciplinary view of reality emphasizes creativity over adaptation and survival, openness over determinism, and self-transcendence over security (p. v).

Various questions and problems connected with this topic are discussed in the book in a somewhat haphazard manner. This is due to the very nature of the volume: it is a collection of papers written for an American Association for the Advancement of Science symposium. In such instances little editorial control can be exercised over the various contributions other than stating the intentions of the event and selecting the most suitable participants. The result is usually a "nonbook" of diverse writings, loosely united by the stated topic. This is the case here, too. While papers by Hermann Haken, Peter Allen, Ilya Prigogine, and Erick Jantsch focus on the work of the Prigogine school as a basis for the evolutionary vision, others by Howard Pattee, Lars Löfgren, Ralph Abraham, Elise Boulding, and Herbert Guenther explore the authors' own preoccupations and interests (generally in the area of the meaning of unifying concepts of evolution) but do not systematically mesh with the Prigogine theory, presented by Jantsch as the scientific breakthrough in the field.

The diversity of presentations makes for interesting reading, and what the volume lacks in cohesiveness (despite Jantsch's valiant attempts to tie up the loose ends) it makes up in variety. The overall impression is that there is now a real scientific basis for the unification of such classical and distinct branches of science as physics, chemistry, biology, ecology, and the social sciences. This impression is significant and carries the main message of the book. It is underscored by the fact that this topic could be included in a special symposium of the American Association for the Advancement of Science, and that it was thereafter selected for publication. The value of the book is as much in its very existence as in its specific propositions.

On the latter score much is said that is of great interest. Haken compresses the main tenets of what he calls "synergetics" in reference to universal principles of evolution, while Allen applies the Prigogine theory to fields as diverse as ecology and economics. Prigogine bolsters the new orientation toward irreversibility, which underlies his theory, by arguing that received physical theories, even quantum mechanics, are deficient by neglecting the dimension of time as a factor internal to the description of process. Jantsch's own lengthy paper seeks further unifying principles, exhibited over a three-fold range of on-

togenesis, phylogenesis, and anagenesis (the latter being identified as the evolution of evolutionary dynamics which brings into play new levels of evolving systems). Thereafter the contributions branch off, focusing on as diverse problems as the meaning of symbols in the physical basis of biological phenomena (Pattee), the language in which evolutionary theories are expressed (Löfgren), the role of mathematics as synthesizer of scientific knowledge systems (Abraham), the function of images in society and social change (E. Boulding), and the parallel to modern scientific theories of evolution in the Indo-Tibetan tradition (Guenther).

The contributions to the volume, with few exceptions, exude the confidence that they have found the philosopher's stone at last. The feeling that something of great value is being discussed may be justified; it is a pity, however, that it occasionally prompts the forcing of explanations into a Procrustean bed. This results from a regrettable lack of awareness of what goes on in related fields: process philosophy in general, and general systems theory in particular. The evolutionary vision was not discovered when K. Boulding coined the term a decade ago, nor was the first cogent theory of encompassing evolution born in the 1970s in the work of the school of Prigogine. Process thinking goes back four thousand years to the Ionian nature philosophers and is alive and well in numerous contemporary schools, including those based on thinkers as diverse as Karl Marx and Alfred North Whitehead. General systems theory (GST) has had continuous development since the mid-sixties at least, and many of the theories advanced within that school bear more than a passing resemblance to the "new" theory advocated in the book. Self-reference in Jantsch's essay is only a new term for the dynamics of self-stabilization described in GST; self-transcendence is similarly a replica of self-organization, while the "symbiotization" of evolving systems does not say anything that was not already stated in theories of evolving hierarchies. Why is it that the editor feels compelled to refer to Thomas Kuhn, whose concept of scientific revolutions is only accidentally related to the new theory but makes no reference, other than implied criticisms, to the work of Ludwig von Bertalanffy? It may be that, as Jantsch says at one point, "the greatest importance of today's evolutionary vision may lie not in its present propositions and concepts, but in the new questions it poses in many areas of scientific endeavor and especially in the unifying 'pull' it exerts in these areas" (p. 210), but would the vision's present propositions and concepts not benefit from a less egocentric perspective, and would its "pull" not increase by acknowledging the value and validity of work already done in these areas? It certainly does not help explicitly to date the "emergence of a paradigm of self-organization" from the 1970s in the work of Prigogine, Manfred Eigen, Haken, and a few others (p. 84).

Curiously enough, what Jantsch terms the "paradigm of self-organization," namely the theory of dissipative structures, makes its major contribution in producing a mathematical model of system self-maintenance (the trimolecular model also known as the "Brusselator"), showing how auto- and cross-catalytic reaction steps maintain a metastable system in a flow. The evolutionary implications of the theory are important, but they were already known by and large in the sixties and before: when changes in the system or its environment reach a critical threshold, the system is challenged to reach a new state of organization or face dissolution. W. Ross Ashby's homeostat, although based on more mechanistic principles, did just that, and von Bertalanffy, James Miller, Anatol Rapoport and this writer described this process and its implica-

tions in some detail. The Prigogine theory adds valuable insights, especially concerning the relationship of deterministic and stochastic processes, developed as a consequence of a confrontation with Jacques Monod and his concept of life based on the interplay of pure chance with physical necessity, but it does not say anything that was not already known in basic outline. Moreover, the implications of a view of evolution as system self-organization through perturbation and creative response have been worked out in relation to problems of mind, society, ethics, and the worldview which could underlie them; yet one has the impression, not only in the book under discussion but in the current literature as a whole, that those who take the Prigogine theory as the new paradigm are aware of the problems but not of the progress already made with respect to them. This leads to some instances of misplaced emphasis. For example, when Allen applies the equations to what he calls "human systems" and produces an analysis of products based on the interaction of supply, demand, and the class of objects that could satisfy a particular need or desire, and another analysis of the growth of urban structures in terms of white and blue collar residents and shopping centers, specialized shops and finance and insurance functions. The truly important application of a theory of auto- and cross-catalytic system functioning, and of instability prompted restructuring, to integral human systems such as cultures and societies is not even attempted, although Kenyon De Greene has called attention to it in no uncertain terms (cf., *Behavioral Science* 26 [April 1980]:103-113). Like the man who looked for his key not where he lost it but where the light shone, nonequilibrium thermodynamicists look for problems where they can write out equations and not necessarily where the problems are really situated.

It is not surprising that the results are not entirely satisfactory, even to the theorists themselves. Allen concludes that "the notion that human systems must be characterized by well-defined problems, to which there must exist equally well-defined answers, is not a result of this new point of view" (p. 67). However, lack of problem definition is not due to the point of view but to the application of it to concrete situations, namely, the absence of conceptually sound system models of actual societies. This is a task of great urgency, and it could clearly benefit by joining the specific insights of the dissipative system theory to the general system concepts already evolved in the literature. This would be far more productive than such things as "discovering" dissipative system theory in Indo-Tibetan speculations, as Guenther does in this volume. The payoff of his exercise (replete with analogies such as "isness totality" functionally equals vacuum fluctuation) seems to be that the new theory of evolution is reflected in Tibetan wisdom in the idea that an inherently intelligent and playful universe experiments on itself and builds toward higher levels of complexity, if that is what "the tendency, initiated by the process of accessing, toward thematizing the mutually informed connectedness of this dynamic playful movement" really means (p. 202).

Regardless of these instances of idiosyncratic problem setting and attempted rediscovery of the wheel, the book contains many genuine insights. Its significance unfolds on two separate planes: in what it says and that it says it. The latter should be further enhanced by acknowledging the value of its contribution, with its strong and weak points, and subjecting it to open and constructive debate. The former would benefit from linking up with related efforts in general systems theory, systems philosophy, process philosophy in general, and cybernetics, thereby avoiding duplication and blind spots.

The phenomenon underlying the nature of the book's contribution is interesting in itself from the viewpoint of the sociology of science. The philosophical scientific movement toward transdisciplinary integration received a badly needed fresh impetus when Prigogine was given the Nobel Prize in 1977, although it is ironic that he received it in a discipline as delimited as chemistry. Henceforth one could gain a measure of legitimacy by latching on to this theory when elaborating concepts of integrative evolution. This has led to the distancing of the refashioned theories from fields which have not been crowned by a Nobel award, such as GST. One wonders how the evolutionary vision would have evolved in the literature had von Bertalanffy been awarded the Prize; he died in 1972, the year he was nominated for it. The result is the semi-isolation of the theorists of dissipative structures (an early Prigogine idea which became sanctified, although it is far from adequate to describe the thrust of the theory itself) from process thinkers, general systems theorists and their ilk. Such semi-isolation was no doubt useful and even necessary in the early formative stages of theory construction, but that period, to judge from recent literature, is now over. The reimmersion of the Prigogine school's work in the great and growing stream of evolutionary process thinking would now be in order. It would not threaten the loss of identity of the theory for once it has been legitimized in this striking fashion it cannot be easily forgotten or mistaken for something similar; on the contrary, it could test related concepts, profit from explorations already completed or presently underway, and develop its own philosophical software through constructive dialogue.

These remarks are not intended to detract from the two-fold significance of the book. It is a collection of essays that needs to be read, but read in context and perspective.

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*Beyond Ideology: Religion and the Future of Western Civilization.* By NINIAN SMART.  
New York: Harper & Row, 1981. 350 pages. \$16.50.

In this day of multiplied attempts in the West to face the question of conflicting truth claims among the religions of the world, and to achieve a meaningful interaction among them, Ninian's Smart's *Beyond Ideology* is a promising addition. It is a freshly conceived and engagingly written work. As an exemplification of a history of religions approach, an inside-detached view, it is sympathetic, irenic, and persuasive rather than polemical or reductionist. The style is refreshingly informal, and Smart displays an easy familiarity with various religious traditions and associated social-cultural factors.

There are some excellent and provocative phrasings such as "The nation as a daily sacrament," "God's path is that of suffering and self-emptying," "war has a kind of sacramental significance for the nation," and the symbolic representation of the divine or transcendent Being "is a kind of congealed performative." Sometimes the relaxed style and grasping for new and arresting phrases leads

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the author into less happy phrasing such as "Christ . . . called God 'Dad,'" "perhaps Buddhism is best in the business of Rent-a-God," "Buddhas and Bodhisattvas . . . were capable of great creative activity, even if none were creator of the whole shoot," "evangelists clad in double-knit suits (knit again Christians)" and the like. But these (and some sloppy proofing of the first part of the book) are minor flaws and do not detract from the interest or value of the approach here chosen. One important feature of that approach is its multi-faceted character: it attempts to deal with the major cultural, social, economic, and intellectual currents which, though not directly religious in themselves, powerfully affect the inner life and world prospects of today's religious traditions. There are the visible-vocal presences of several major and numerous minor religious traditions, each calling for people's allegiance, both in competition with each other and in often ambivalent relation to the strong currents of nationalism, Marxism, science, and nonreligious humanism. Nationalism is often dubiously and compromisingly allied with religion—nationalistic Christianity, Islam, and Buddhism for example. Marxism seeks to constitute itself as a substitute religion of earthly economic-social salvation. Science provides the intellectual setting in which all of these factors, including religion, must today play their roles.

This is an ambitious and important undertaking, to view religion—mainly Buddhism and Christianity—meaningfully in this context of multiple diversity; the author's wide-ranging familiarity with religious, philosophical, and social materials serves him well. At the same time this complexity of factors to be dealt with, along with the easy, informal literary style in which color and verve sometimes compete with structure, seems to make the progression of thought, and the relation of all these aspects to each other, somewhat confusing. One tends to lose his way in the middle portion, although in the end the author brings out his main points clearly and resolutely enough. My personal feeling is that the chapter on the Chinese experience did not contribute much to the final argument.

What then, in the author's opinion, is the function of religion in such a context? Smart's point here is well taken. Religion provides a sense of the transcendent; this is the heart of religion and is religion's unique and very important gift to civilization. Religion's witness calls for a critical estimation of the values and goals of the world—social, economic, ethical—from a transcendent viewpoint. It offers a transcendental critique of human life which cannot be adequately mounted from within that life itself. This spirit is not really at odds with the scientific critical spirit, the author maintains, but is its companion at a different level.

What transcendency does Smart propose to use as a critical base—for religious transcendencies vary, say from the Christian God to Buddhist Emptiness? "If I had to find a brief name for the ideology here described, it would be 'transcendental pluralism'" (p. 14), that is, variations in the description of the Ultimate Transcendent. (This of course is in accord with Smart's history of religions approach.) But how shall God, the Fullness of Being who is apprehended as Person in a numinous awesome encounter, be related to the Buddhist awareness of Emptiness as non-numinous, self-analytical, nondual consciousness? Smart's answer is that while the two experiences are not identical they are not contradictory either. There is a kind of emptiness at the heart of the Christian experience, especially the mystical type: the emptiness of Meister Eckhart's godhead beyond God, the summit of the *via negativa*, the self-



emptying kenosis of God in Christ, a self-fulfillment by self-emptying. Thus can Buddhism and Christianity be put into complementarity rather than opposition.

The author's irenic attitude does not keep him from making some judgments even though, a la history of religions, valuations are bracketed. He notes the various ways in Christianity in which the concept of God-power has been subverted to oppressive power exercised in the name of God. In Buddhism he finds a certain failure to solidly ground personal worth and dignity in the transcendent—in whose affirmation Buddhism is weak. It gives only a provisional status to personhood, an insufficient base for the defense of human worth against today's strongly impersonalizing forces.

In general I find myself in sympathy with Smart's mode of interpretation and with many of his ideas. But some difficulties remain. Is the book properly titled? Is it really beyond the conflict of ideologies? On one level, yes: the cliché of pitting a numinous personal God directly and literally against a negative Buddhist emptiness is rightly avoided. But as he himself proclaims his "ideology is that of transcendent pluralism." Thus various unsatisfactory monistic, dualistic, and pluralistic theories of the ultimate must be ideologically weighed; and Smart's transcendent pluralism is a more rarefied ideology, unless he wishes to be a nondiscussing mystic for whom all ultimates are one without distinction—which he does not.

Again, is mysticism really the best way, the only way, to achieve a complementarity between Buddhism and Christianity? If so, it will leave most practicing Buddhists and Christians out of the dialogue. Besides, Christian mysticism has always been modified by its personalism, both human and divine. Eckhart's godhead was in the very inmost heart of the personal (Trinitarian) God, not outside Him, and therefore not quite comparable to the Zen no-self awareness, the late D. T. Suzuki to the contrary.

Further, Smart's effort to achieve a nonontological Transcendent Focus for the Christian experience of God would seem to be giving away the show to many Christians. "The affirmation of this Focus [of the concept of a beyond-reality] confers 'objectivity' upon the real Focus *which is how a religion's central value enters into the lives of human beings*" (p. 187, italics added). I found it hard not to think that Smart was saying here that all that matters for religious reality and power is that people *believe* that there is such a Focus, that is, the psychological reality is all that matters. That may be all that matters to the history of religionist, but it scarcely does for the religious believer.

Finally, there is some question about the interpretation of emptiness as a common ground on which Christian and Buddhist can meet. While Smart speaks of a kenotic emptying of God into Christ (a point which Hans Waldenfals treats more satisfactorily in his *Absolute Nothingness: Foundations for a Buddhist-Christian Dialogue* [New York: Paulist Press, 1980]), it comes across more as an emptying out of ontological reality than an emptying into self-negating sacrifice.

On the other hand, Smart seems to make the Buddhist Emptiness more empty than it should be. The emptiness of the Buddhist experience of purified consciousness is just that, not an assertion of metaphysical emptiness. The Ultimate Emptiness in Buddhism is without form, yet is the inexhaustible, metaphysically real Source of all forms. Further, the *experience* of that Emptiness is not totally non-numinous as Smart seems to suggest. There was the Theravada monk who "described" the Ultimate Emptiness of Nirvana as "Bliss

ineffable!" in a voice choked with awe. Bukkō, a thirteenth-century Zen monk exclaimed upon enlightenment: "My eyes, my mind, are they not the Dharmakāya itself? . . . Today even in every pore of my skin there lie all the Buddha lands in the ten quarters!" (D. T. Suzuki, *Essays in Zen Buddhism*, first series [New York: Harper & Row, 1949], p. 241). And Hakuin, an eighteenth-century Zen monk, wrote of satori: "Then suddenly, as though the sheets of ice were struck and shattered, and the tower of glass [in which he had been psychologically incased] were brought down, he will experience such great joy as he has never known or even heard of in all his forty years [i.e., a full lifetime]" ("The Fourth Letter of Hakuin's Orategama," trans. Winston King, Jocelyn King, and Tokiwa Gishin, *Eastern Buddhist* new series 5, no. 1, p. 109).

Despite these criticisms—which are only the obverse side of the interest aroused by the reading of the book—Smart's *Beyond Ideology* is abundantly worth reading for the freshness of its approach, its scope, and the important questions and possibilities it raises in the field of interreligious communication and experience.

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*The Omega Seed, An Eschatological Hypothesis.* By PAOLO SOLERI. Garden City, N.Y.: Anchor Books, 1981. 286 pages. \$9.95 (paper).

Charles Hartshorne once wrote that God is both the "supreme source" and the "supreme result" of the evolutionary and historical world process (*The Divine Relativity* [New Haven, Conn.: Yale University Press, 1964], p. 59). Paolo Soleri proposes a God who is only the ultimate result, not the prime mover of the world. Borrowing the cryptic eschatological symbol of Pierre Teilhard de Chardin, Soleri believes in an Omega God. Teilhard, like Hartshorne, found God to be both Alpha and Omega, Beginning and End, but Soleri praises only the Omega God, inveighing against the Alpha God. Traditional theism is a misleading illusion, although it may have served a stage on the way. Our present human challenge is to become what we are, the seed of God, and hence Soleri's title. We are the *Omega Seed*.

This is a radically critical and speculative hypothesis, at least if we take it in full-dress boldness. Classical monotheism is wholly ill-conceived and must be transvalued. God did not make us; we make God. God is not our Father; rather we are the seed of God. Augustine could say: "In Him we live, move, and have our being." But Soleri says, in effect: "He lives, moves, and has his being in us." Soleri's divine Advent is of a heterodox kind. God is born in us, but this means that we give birth to God, not (what the Alpha Creed holds) that we are born and reborn in a God who pre-exists us, coexists with us, and transcends us. The movement is to God, not from God. Even *Zygon* readers, who may welcome revisions of classical theism, will find this a heady claim. Muhammed could say, "There is no God but God, and Muhammed is his prophet." If we paraphrase him, perhaps oversimply, Soleri's creed is, "There is no God yet, and Soleri is his prophet."

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Soleri, an ex-Catholic, detests classical theism with something of the hostility of a lost love. God, the same yesterday, today, and forever, has never existed but is a projection unawares, a "simulation," a "deception" (p. 33). The Alpha God is not to be worshipped; rather the Omega God is to be built. Yet Soleri also wants to salvage something of the Biblical heritage, not as a revelation of God but rather as a blueprint for God. Many readers, theists and nontheists alike, will have doubts whether Soleri is entirely fair to the theism he has spurned.

On the positive side, Soleri conceives of the historical process as the making of God. Here there are both naturalistic and humanistic elements in his creed. In general, I find the naturalistic dimensions, though weakly developed, more credible than the humanistic proposals, although the latter are key axioms for his hypothesis. The world is a drama of matter evolving into spirit, seen in the development across primordial particles, atoms and molecules, microbes, plants, animals, and humans. The story is "an immense metamorphosis of matter into spirit" (p. 75). That much, of course, is a frequent theme in evolutionary theism. In various ways it can be accepted by naturalists, monists, pantheists, and even by neoclassical theists.

However, Soleri adds his distinctive twists. He wants to deny any divine transcendence over the process. Further, he removes and dilutes the divine immanence from the earlier stages, transferring God more and more into the future states following a pivotal passage through human endeavor. In the beginning there was no God, there were only  $10^{80}$  particles, which we can also think of as "particle-godlets" (p. 67). There were only fragments of god. Progressively these coalesce and complexify until after twenty billion years of evolutionary development we get as far as a seed of God—ourselves. Soleri's choice of words indicates, I think, something of his evaluation of what has so far happened in spontaneous nature. The passage from particle-fragment to seed is mostly prolegomena. The birth of God really lies ahead; it is exponentially forthcoming.

Soleri's vision onwards is unbounded. He seems to believe, if we look millions of years ahead, that humans will not only redesign earth but colonize space near and far, building ever more cities across the universe. This explosion will gradually convert all the matter-energy in the universe into the God-Spirit. In the beginning life and spirit are unknown in the physical universe, even now they are quite rare, but in the eschaton they will become more common and eventually pervasive. At the beginning physical matter was common, but it will progressively disappear and eventually be eliminated. "Godliness is achieved in toto if and when the cosmos in toto has rid itself of the constraints of mass-energy time and space" (p. 36). Space, time, mass, energy will be entirely consumed to create pure spirit (p. 67).

We have no divine origin, but we have a divine destiny. "Life, conscience, and spirit are not generated by other than themselves. They are a fatherless phenomenon powerfully and irreversibly urging the winding up of the cosmos into the synthesis of divinity" (p. 109). "The responsibility of life lies in the transfiguration of an immensely powerful physical phenomenon into an immensely loving spiritual one." This is our "eschatological imperative" (p. 146). The route to "theogenesis" passes necessarily and crucially through "homogenesis" (p. 116).

It is hard to know whether to take this hypothesis as a model, a metaphor, or a myth. Soleri seems to think he is predicting what is going to happen and prescribing what ought to happen. Most of us have learned to be half-

comfortable with the notion of a big bang at the start of the universe, although we do not really understand it. All matter-energy exploded out of a densely packed initial ball. Soleri claims that at the end the matter will be transubstantiated into spirit and gathered into one God. For the physical beginning we have a sort of a model, but Soleri's spiritual ending seems more a mystical vision, and it is not clear that he is making as much sense as he thinks. Like other apocalypticists he falls into rapture and incoherence.

A key concept enroute to the eschaton is what Soleri calls "the urban effect" (p. 162 and *passim*). To my mind, this is an ill-chosen phrase, suggesting urban blight and urban sprawl. But Soleri, who is even more critical of our modern cities than I might be, wants to reform the urban model. He does an enormous amount of constructive work with this unlikely term. To urbanize the earth, to urbanize indeed the universe is to spiritualize them: "urban" really refers to an integrated community which more and more approaches a kind of centered oneness. The underlying biological preface already shows the urban effect, which Soleri also calls, after Teilhard, complexification. But the phrase principally applies to the future. Humans will create even more dramatic exosomatic structures, a built environment. They will increase their know-how, instrumentation, data base, technology, and industry. This will not be for the gain of material goods but rather in the service of spirituality.

Thus Soleri is a high-order developmentalist. We are to build penultimately on earth and ultimately in space what earlier Alpha-theologians called the City of God. However, Soleri thinks that the City of God is God. Here Soleri trusts much in machines, although he always wants them as our servants. We need to learn "the mechanics of God-making" (p. 93). "The hope of the species, godliness, resides in refinement of the extrabiological servosystem" (p. 33). With the supposed Alpha God, scientists used to say that they thought God's thoughts after him, but Soleri's scientists and architects seem rather by technological inventiveness to think God's thoughts before him.

Reading Soleri is like swimming through wet sand. His language is flowery, dense, vague, pompous, and groping. He rambles dreadfully. There is little or no progress through the book; the chapters could be rearranged and read as easily. He is rather isolated from the mainstreams of both theology and science. He never uses or criticizes other thinkers in these fields but goes his own way in splendid, self-contained vision. This can, of course, result in prophecy, but it also can result in dreams and in riding a private hobby horse. Nevertheless, impossible maverick though he is, Soleri has an overall thesis which deserves a thoughtful response.

Although from a psychological point of view we do get an enormous challenge (we are called to build God!), from the logical point of view Soleri's system gives no explanation of origins or of the increase in meanings from physics to spirit. He gives us more out of less. There is no Prime Ground. The developing world is a kind of bizarre given. Once there was nothing but a swarm of particulate matter-energy fragments. These self-assemble into persons and persons build up into a terminating God. But surely what one wants in a religion is not merely an explanation of where we are going but also an explanation of where we have come from and by what power we travel. One needs to connect a supreme source with a supreme result. To give us Omega without Alpha is to increase the puzzle, not to solve it. Everything is explained in terms of the God who is not present until the end. That is teleological explanation with a vengeance! If Soleri is right, it seems truer to say that

humans form the explanation of God than that God is the explanation for humans.

I can suggest two ways of reading Soleri, somewhat analogous to the ways Sunni Muslims used to treat those Sufi enthusiasts who claimed too close an identity with God. The first is to take the claim at face value, in which case the heretic is judged to be incredible, blasphemous, and even comic. The Hebrew Scriptures portray foolish, proud earthlings who tried to build a tower of Babel merely to reach up to heaven, but here is an architect who wants to start making God himself! However, the second, more charitable way is to say that the extremist in his ecstasy misspoke himself. What he really meant, or should mean, is something less objectionable, indeed something commendable about the nearness of the divine to the human life. If we may use the traditional idiom, Soleri is yearning for the Kingdom of God and confusing this with the King. He can no longer separate being like God from being God. He presses so furiously toward the mark of destiny that he mistakes his goal for the rock from whence he was hewn.

Readers who can demythologize Soleri will find that much of what he wants for society they also want—in essence society with a spiritual focus rather than a materialistic one. But even when his inflated rhetoric is cashed out in common coin, I fear that in his urban enthusiasm Soleri has no thoughtful place for the spontaneously wild, an element of creation which others of us are concerned to appreciate and preserve. This is not incidental but is a logical byproduct of his incapacity to see much of the divine in those creative natural forces which precede the human coming. Soleri seems not to like matter; he wants it consumed into spirit, the Omega God. But at least the Alpha God created matter and pronounced it good.

There is here something of the City of God but something too of the stuttering confusion that followed the tower of Babel. There is something of the desire to image God, to which at our genesis we were called, but something too of the desire to usurp God and take things into our own hands, for which in Genesis the race becomes fallen. Perhaps the best tactic is to regard this book as what it proposes to be, a hypothesis, in the present stage only dreamed up in a context of discovery, not yet even tested, much less justified. We will wait to see what this hypothesis can explain, whether it can predict anything, and what conduct it can generate. *The Omega Seed* should be tested by its fruits.

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*Advice and Planning.* By MARTIN H. KRIEGER. Philadelphia: Temple University Press, 1981. 241 + xiv pages. \$18.95.

This is an unusual, fascinating, difficult, and rewarding book. Martin H. Krieger was trained as a physicist and now teaches in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology. The book is especially difficult to summarize because, in the author's words, "I have tried to make the argument architectonic, transcendental, dialectical, and therapeutic"

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(p. 201). Strongly influenced by various German philosophers—especially the idealists such as Immanuel Kant and G. W. F. Hegel, but also by Friedrich Nietzsche, Sören Kierkegaard, and Ludwig Wittgenstein, the author often speaks in aphorisms which it would be dangerous and misleading to quote out of context.

Krieger's major contention is that advice and planning are, or should be, ordinary human activities in which people tell stories to each other, try to arrive at a common understanding of problems, and so control the world as they perceive it. "I believe that planning, policymaking, design, science, and advice-giving are more alike than different from most of our other everyday human activities," he writes and asserts that "my basic claim is that we can learn a good deal about how we apply our knowledge in professional and bureaucratic settings by thinking about what we do in more intimate ones" (p. ix, x). He has strong and cogent criticism for professionalism, science, and expertise as bases for advice and problem solving.

Throughout the book there are fascinating attempts to relate the special activities which advice givers and planners engage in and speculate about to ordinary—and extraordinary—human life. Decisions, Krieger argues, are "conversionary experiences"; and "there is a substantive continuity between what the anthropologists and the theologians tell us about our world, what we view as bureaucratic and social science practice, and what we do ordinarily every day" (p. 104).

Krieger's discussion is almost infinitely wide-ranging, combining a long discussion of BART (Bay Area Rapid Transit), for example, with several pages on the soul. The bibliography also has that characteristic, including esoteric social science studies of planning and decision making with works of philosophy and literature. The endnotes are not merely citations of sources but are often discursive, telling us much about the provenance of Krieger's ideas and often offering a running commentary on the discussion in the text.

*Advice and Planning* is a unique book which deserves a wider audience than it will receive, because the author is engaged in synthesizing insights from religion, science, philosophy, literature, and common sense. The issues he touches upon are basic to all human endeavors, and persons from all walks of life should ponder them. Even if you cannot always completely agree with Krieger, you will find him stimulating and probably look upon the world differently after reading him.

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*Technology and the Future: A Philosophical Challenge.* By EGBERT SCHUURMAN.  
Translated by HERBERT DONALD MORTON. Toronto: Wedge Publishing  
Foundation, 1980. 458 pages. \$19.95.

Originally published in Dutch as *Techniek en toekomst: Confrontatie met wijsgerige beschouwingen* (Assen: Van Gorcum, 1972), this translation makes available in English the most detailed, meticulous critique available of mostly European

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philosophy of technology from the perspective of the Dutch neo-Calvinist approach developed by Hendrik van Riessen. The book is, in fact, Egbert Schuurman's Ph.D. dissertation, written as a student under van Riessen, and it suffers many of the defects of dissertations.

Some brief background comments are in order here. Van Riessen, like Schuurman, is an engineer-philosopher with the philosophy add-on coming as a midlife changeover from a professional engineering to a philosophy career and with the philosophical orientation a sectarian one. What van Riessen's, and Schuurman's, philosophical approach amounts to is an application to the analysis of technology of the Dutch Reformed philosophy especially of Herman Dooyeweerd (see his *A New Critique of Theoretical Thought*, 4 vols. [Phillipsburg, N.J.: Presbyterian & Reformed, 1953-58]). Schuurman utilizes modifications of this approach, for example, by J. P. A. Mekkes, none of whose works are so far translated into English. Further details on this background, together with a predictably favorable review of Schuurman's book by his translator, are available in P. Durbin, ed., *Research in Philosophy and Technology* (Greenwich, Conn.: JAI Press, 1980), 2:293-340.

What results from all this in Schuurman's book, especially in combination with an unrelieved dissertation style, is a highly technical exercise in applied textual analysis. The categories are those of the Dutch Reformed philosophy; the "texts" to be analyzed are contemporary technological practice and the works of European philosophers of technology. The final quarter of the volume does present Schuurman's own version of Dutch Reformed philosophy of technology but in the same stilted, excessively category-bound style.

Schuurman's work has four parts: an analysis of contemporary technology in terms of the very precise categories just mentioned; exposition, analysis, and critique of "transcendentalist" philosophers of technology (Friedrich Georg Jünger, Martin Heidegger, Jacques Ellul, and Hermann J. Meyer); exposition, analysis, and critique of "positivist" philosophers of technology (Norbert Wiener, Karl Steinbuch, and Georg Klaus); and a "liberating perspective" for technological development. Aside from the unfamiliar names, what Schuurman has in mind as transcendentalists and positivists are the same schools of thought that Bernard Gendron calls "dystopians" and "utopians," namely, culture-critics of technology and advocates of technology-as-savior, respectively (see Gendron's much more readable *Technology and the Human Condition* [New York: St. Martin's Press, 1977]). Schuurman differs from Gendron in lumping Marxists (Gendron's favored position) together with positivists.

Schuurman's analysis of contemporary technological practice, using his own version of a van Riessen-like categorical scheme, is extremely detailed, meticulous, and nuanced. There is no question that he understands technology from the inside. However, the categorical scheme when combined with an extreme succinctness and precision of phrasing makes the analysis read almost like a technical manual.

This same problem afflicts the "transcendentalist" chapter to an even greater degree. Heidegger, whether in his general philosophy or in his philosophy of technological nonculture, is notoriously difficult to translate and to understand. But when Heidegger's German is translated into Dutch and then into English, with each translation adding a further reification of Heideggerian neologisms transforming them into a technical jargon, the result is not likely to help any but the most painstaking student understand what the original was driving at.

Schuurman is capable of a reasonably clear interpretation of Heidegger:

Heidegger, as philosopher, rightly and necessarily addressed himself to technology, since "our" world is no longer thinkable without it. It might well be argued that the beginning and elaboration of Heidegger's philosophy of Being received a stimulus from the development of modern technology. A first requirement for understanding his philosophy would then be to investigate what he has said about technology. Is it not modern technology as danger that leads Heidegger to speak of a reversal essential to bringing deliverance? And it is this reversal that gives substance to Heidegger's philosophy of Being (p. 109).

This comes in a summary at the beginning of Schuurman's critical analysis of Heidegger. The meaning is clear: Heidegger's interpretation of modern society as technological makes sense of his search for deliverance via an existential, antimetaphysical philosophy—a deliverance, as we shall see, that Schuurman thinks cannot come by that route.

Earlier, however, in his technical summary of Heidegger on the needed reversal, Schuurman is much less clear:

The dichotomy between Being and man permeates not only Heidegger's view of technology as danger but also his view of the possibility of deliverance from it. Originally man "set" technological reality, after having been called to that task by Being in e-vent (*Ereignis*). The essence of modern technology, the *Ge-stell*, gradually preempts man for itself. Man is altered from a mediator between *Ge-stell* and fund (*Bestand*) and, becoming fund himself, a mere *gestellter Mensch*, he is estranged from Being. However, man is again essential to deliverance from forgottenness-of-Being, for he serves, as it were, to create the preconditions for the reversal. The reversal itself, furthermore is a Being e-vent (*Seinsereignis*) that disposes over man (p. 96).

Although it is possible to make sense of this passage (though probably not unambiguously), Schuurman's concern to get Heidegger's terms and phrases exactly right does not help. Neither is it any comfort that others have preceded Schuurman in such literalism. The translator cites a Heidegger translator, William Lovitt, as the source of the odd translation "fund" for *Bestand* (see p. 90, footnotes). Although, as the old cliché has it, "translating means betraying," slavish literalism does not solve the problem. And here we have multiple translation: from contrived German to a peculiar Dutch philosophical vocabulary to English—where neither the neologisms nor the technical jargon is congenial.

I do not mean to overemphasize Schuurman's treatment of Heidegger; it takes up only a portion of one of his four chapters. Treatments of other transcendentalist thinkers, while suffering from the same tendency toward reifying concepts or phrases, are not quite so difficult. Another notoriously difficult thinker, Jacques Ellul, is cited only in English translations of his works. And reading the chapter on the positivists (paralleling Gendron's technological utopians) is, for the most part, easier still. But there is reason to emphasize Heidegger: His problem, deliverance from the enslaving power of modern technology, is the source of Schuurman's problem. The translator, H. D. Morton, had earlier translated the title of the book as "technology and deliverance" (see *Research in Philosophy and Technology*, vol. 2, p. 329, where the final chapter is entitled "A Liberating Perspective for Technological Development").

Does a Dutch Reformed philosophical formulation of a protechnology position—a view of humans as ordained by God to find meaning in technological development—in fact offer a liberating perspective, a way out of the



problems produced by technology? The question probably does not even make sense when put in such sectarian terms; perhaps even a broader version—Does Christianity offer a liberating perspective?—is still too narrow. For a bibliographical survey of Christianity and technology by Carl Mitcham, see the *Science, Technology and Society* newsletter, Lehigh University, no.14 (November 1979).

What might make sense is to ask: Does any sort of transcendental perspective (presumably as opposed to Schuurman's "transcendentalist," with a negative, pessimistic connotation) offer a way out of our high-technology era's major problems? Broadened that far, the answer is probably yes; our technological culture has become so fragmented and specialized that anyone who offers the hope of providing the wisdom and vision we need is welcome to attempt to make a contribution. Perhaps that is the best way to read Schuurman's book, although for this reviewer it seems doubtful that very many readers, at least those unsympathetic to Reformed Christianity, are going to respond positively to Schuurman's version of technological wisdom. Critics will find him too protechnology; protechnologists will likely be turned off by his technical philosophical jargon. This is perhaps a shame since we have here one of the few cases of a technological insider doing serious philosophy of technology.

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*The Transforming Moment: Understanding Convictional Experiences.* By JAMES E. LODER. New York: Harper & Row, 1981. 229 pages. \$12.95.

James Loder counsels that we ought not to take contemporary enthusiasm for spiritual phenomena, mystical experience, and charismatic manifestations too lightly. Ours, he asserts, is an era sorely in need of new ways of thinking. Transforming moments through which individuals open up to a wider spiritual universe constitute a kind of koan to be placed before the canons of scientific rationality. That is, these convictional experiences are important precisely for the reason that they appear nonsensical within the assumptive world of the human sciences. Loder, writing from the perspective of one who has undergone such a transforming moment, argues for a new theory of knowledge which does justice to the scientific, clinical, and theological perspectives alike.

Transforming moments, Loder argues, disclose the ways in which humans inhabit four dimensions: the lived world, the self, the void, and the holy. Loder maintains that an ego which has become incarcerated by the first two dimensions of our being (the lived world and the self) is destined to break down when confronted with the expectable crises or challenges of adult life. Then, as the void or threat of nothingness begins to engulf the self, the transformational potentials of personality at last make possible a conscious movement toward wider ontological realities from which wholeness flows. In an exceptionally lucid chapter entitled "Convictional Knowing in Human Development," Loder draws upon the stage theories of Erik Erikson, Jean Piaget, and Carl Jung to demonstrate that the "transformational logic" of convictional experiences (i.e.,

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the cognitive movement from narrower to more inclusive worldviews) is simultaneously the paradigm for each and every movement between developmental stages. In all of this he insists that the self's transformational potentials, while working through the developmental stages of personality, transcend them. Stated more forthrightly, the transforming moment proceeds from an ontological or cosmological reality for which spirit is the most appropriate term. Loder goes on to contend that convictional experiences alone bring authenticity because they alone open us up to the four dimensions of our being and thereby set us into an immediate relationship with the "cosmic ordering, self-confirming Presence of the loving Other" (p. 173).

Loder's effort to clarify the epistemological status of convictional experiences is a definite advance over the work of Willem Zuurdeeg upon whom Loder acknowledges dependence. The subtle interplay between psychological demonstration, philosophical argumentation, and theological discourse make this a work which will guide reflection on this subject for some time to come. At points it moves with the combined force of William James's case for the will to believe, Thomas Kuhn's demonstration of the role of anomaly in scientific discovery, and Paul Tillich's elucidation of the courage to be. Over and beyond this general accolade, I wish to make but two comments. First, Loder's portrayal of the transforming moment resonates not nearly so much with ego psychology as it does with the psychology of self and object relations theory as has been articulated by Heinz Kohut, Donald Winnicott, and others. Inclusion of recent theoretical perspectives on "transitional objects" in the ontogenetic synthesis of a prized and cohesive self would have added considerable force to a psychological analysis of transformational logic. Second, I was left unconvinced by his forced imposition of Christian theology onto a line of reasoning best left at the ontological or metaphysical level. It would seem that Buddhist metaphysics, for example Nagarjuna's writings on *śūnya* (the void) and its role in disclosing ultimate reality, fits Loder's thesis far more readily than the interpretation of Christian soteriology which he offers.

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*Psychology and Christianity: Integrative Readings.* Edited by J. ROLAND FLECK and JOHN D. CARTER. Nashville: Abingdon Press, 1981. 428 pages. \$14.95.

This book is a welcome contribution to the growing literature relating psychology and theology. Its editors are on the faculty of Rosemead Graduate School of Professional Psychology, a center of conservative evangelical thought about psychology and of training in counseling from that point of view. Its contributors uniformly represent the same point of view, which gives the volume a degree of continuity not always found in collections designed as a textbook, as this one is. Despite the uniformity of presuppositions regarding the infallibility of scripture and the propositional character of truth embodied in it, there is a considerable diversity of positions and opinions among the authors of the thirty-four chapters. John D. Carter, who, in addition to coediting the volume, authored five of its chapters, seems to be the dominant mind at work in the

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book. Carter approaches his task with a sophistication in interdisciplinary methods; this leads him to seek for some genuine connections between modern psychology and his understanding of theology which go well beyond parallelism of ideas.

The book is divided into eight sections containing three to five chapters each. The sections are: Introduction to Integration, Models of Integration, Maturity: Christian and Psychological, Religious Understanding and Thought, Counseling and Therapy, Human Sexuality, Christianity and Psychological Theories, and Popular Christian Psychologies. Each section contains an illuminating introduction and poses certain questions raised, but not resolved, in the chapters which follow.

With a work of this kind comment on all components can obviously not be attempted; however, some general observations follow, with the understanding that at least partial exceptions to them may be found in the book. First, in this book psychology is much more developed than is theology, which, to quote one of the authors, is a "nineteenth century theology" (p. 232). This theological outlook, though sophisticated regarding some aspects of biblical theology, is basically devoid of any appreciation of the important variables in theology related to linguistics or models of reality embedded in theological constructs. In this connection it can be noted that none of the authors possesses an advanced research degree in theology, while many hold doctor of philosophy degrees in psychology. Carter and Richard J. Mohline have some grasp of the importance of presuppositions in both theology and psychology, but even these authors do not seem to see their significance in relation to models, or to the role of analogical thinking in theology, as contrasted with univocal thinking. Second, the amount and quality of empirical research cited and reported in *Psychology and Christianity* is impressive. Although I did not always find myself in agreement with the authors' interpretation of the research, the book can be recommended as an important source of research on religion. Third, there is a kind of Arminian slant to many of the chapters in their reliance on the concept of self-actualization to interpret sanctification psychologically. Since I have long questioned the adequacy of this conceptual approach I did not find this to be a useful emphasis. Fourth, I found several chapters to be particularly helpful. David E. Carlson's "Jesus' Style of Relating: The Search for a Biblical View of Counseling" is a provocative defusing of the search for *the* biblical style of counseling which has preoccupied some conservative evangelicals. S. Bruce Narramore's "Guilt: Three Models of Therapy" will be helpful to many pastors, regardless of their theological outlook, and to other counselors as well. Carter's careful analysis of the many problems, both biblical and psychological, in Jay Adams's position, presented in "Adams' Theory of Nouthetic Counseling," is the best dissection of Adams's work that I have seen.

Although applause has not been offered to everything in this varied book, I stress again that it should be appreciated as a serious attempt to begin to address the hard issues of interdisciplinary thought within the conservative evangelical community. My hope is that soon the authors may lose their discomfort with some of the rest of us who have been struggling with these issues for a generation. We can use their hardnosed respect for truth as they see it.

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*Philosophie des Lebendigen. Der Begriff des Organischen bei Kant, sein Grund und seine Aktualität.* By REINHARD LÖW. Frankfurt am Main: Suhrkamp, 1980. 358 pages. DM 34.--. \$22.40.

The basic content of this book was accepted as a doctoral thesis in philosophy at the University of Munich, West Germany in 1978. Reinhard Löw is, however, no newcomer to this general area of investigation, having received a doctorate in the history of sciences in 1977. He also has several booklength publications in the area of the philosophy of sciences to his credit.

*Philosophie des Lebendigen* is divided into four chapters. The first one, the problem, delves into the pre-Aristotelian and Aristotelian understanding of the living. The second, the development of the theory of the organic up to Immanuel Kant, is the shortest chapter and traces some of the crucial problems through the medieval era. The third chapter forms the main part of the book and is devoted to Kant and his concept of nature, organism, life, the development of the organic, and the place of teleology. In the last chapter on the systematic place of Kant's philosophy of the organic, Löw attempts to elucidate the implications of Kant's ideas for the present period.

The book contains more than one thousand extensive footnotes (which are interesting in themselves), 27 pages of related literature, and an index of names. The scholarly approach is evident throughout; yet it is easy to read and the main argument is easily traceable, especially with the help of a succinct summary at the end of each chapter. While Löw is intimately familiar with Aristotle, Kant, and the contemporary scene, including the Enlightenment, the medieval period is traversed too quickly. Raymundus de Sabunde or Nicholas of Cusa, for instance, are not even mentioned. It is also surprising that in his discussion of Kant more attention is not paid to the concept of the great chain of being. Nevertheless, altogether the breadth of coverage is commendable.

Löw demonstrates that the view of the cosmos as a well-ordered and limited whole is peculiarly Greek (p. 25), but he does not fall into the trap of seeing everything Greek as cyclical. Teleology is present in Greece already among the pre-Aristotelian philosophers. Löw agrees that Aristotle is the founder of scientific biology. His fundamental achievement was the introduction of the normal as the basis of the science of nature both for the individual and for the whole of nature (p. 34). The normal does not constitute nature but allows us to understand nature scientifically. The starting point of our knowledge of nature is humanity since it is best known to us. Aristotle saw the necessity for a methodological distinction between the natural sciences and the other sciences. He was also the first to introduce a comparative anatomy among the animals. Investigating the approximately 550 then-known species Aristotle detected a continuous chain of being (p. 49). Also within the species nature does not make jumps. Life is continuously developing through mechanical laws. Thus Aristotle eliminated the ontological peculiarity of life. With these two notions, the normal and the mechanical laws of historical growth, we encounter, already in ancient Western thought, the boundaries within which today's discussion moves concerning the essence of the living (p. 53). The transition from science in antiquity to modern science corresponds to the transition from the qualitative to the quantitative view of nature. Quickly the most important feature of nature became its usability.

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In discussing Kant, Löw does not want to isolate Kant from the historical environment against which he reacted, nor to regard him primarily in terms of the *Critique of Pure Reason*. As important at least are the *Critique of Judgement* and the posthumous writings which in no way present a senile Kant. For Kant organic meant primarily living (p. 140). The whole of an organism was for Kant both its cause and its effect (p. 142). Thus nothing should be without *telos* or effect. The life of an animal was for him an absolute unity of the self-propelling power of matter. Kant wanted to understand organic nature with as little recourse to the supernatural as possible. Yet this still necessitated too much reference to the supernatural in order to satisfy a materialistic world view and too little to satisfy a biological view which wants to integrate all phenomena into its own frame of reference (p. 168). For instance, he was convinced of a mechanistic development of the planetary system, but he held that such mechanism is unsuitable as far as the generation of organisms are concerned (p. 180). He explained the necessity of the causal mechanism for the scientific nature of physics but at the same time emphasized that this does not suffice because of the finitude of our perception. Kant found it impossible to explain in purely mechanistic ways a development starting with the original species. Yet he also affirmed an evolvment of the generically pre-formed traits within them; thus, as did Aristotle, Kant emphasized a finality within the organism, both within the species and within life in general.

We can learn from Kant that one should work as far as possible mathematically without ever assuming that such procedure is sufficient to fully explain the concrete objects in nature (p. 215f.). This means that, while we attempt to explain things without recourse to the supernatural, we will, as a matter of fact, touch everywhere on the supernatural, once we have pushed the causal sequence far enough ahead. This is so because the supernatural provides the unity of the foundation of the whole of nature (p. 219). The answer to the goal of everything, to the final goal, cannot be found in the physical. Yet Kant could say that humanity is the final goal of creation here on earth, since we are the only ones who have a concept of goals and are able to form a system and aggregate of goals. This teleological thought leads to two insights: first, the idea of God's presence and, second, the presupposition that sensible human action is possible only on the presupposition of a purposefully constituted nature (p. 225). Similar to Aristotle, Kant asserted that we can understand living nature since we too are living natural beings. Löw even concludes that a transcendental philosophy of nature founded on Aristotle is the systematically proper way to understand the manifoldness of nature.

Quoting Kant in support, Löw opposes the idea that biology is only a subdivision of physics. Once final aims were eliminated from nature, they no longer needed to be regarded and humanity could structure nature toward its own aim. This means in physics that the only understandable factum is that we cannot understand anything (p. 288). Yet as a natural being we find aims in nature which we did not posit. Löw even quotes Paul when he says: "None of us lives to himself, and none of us dies to himself" (Rom. 14:7). Modern analogies to life, such as computers, and the whole range of cybernetics are inadequate to describe living entities because they do not take into account the will to life and the ought to life. Even facticity alone, appealed to in behaviorism, cannot provide a foundation for what ought to be. The ought can only be founded from the experience of what ought to be (p. 302).

While modern mechanistic-materialistic biology can be seen as a consequence of Kant's physical philosophy of nature and his critique of knowledge,

Löw shows convincingly that it overlooks the fact that Kant always demonstrated that physics is never sufficient to explain the phenomena of life. Löw sees the decisive alternative today not between research for causes of "half-hearted" final aims, but rather whether we can understand nature, that is, whether we interpret it anthropomorphically or we ourselves become an anthropomorphism. In other words, we ought to have courage to admit that objectification of life is only an abstraction. The reality of life is larger than any conceptual model.

Löw's book has many merits, not the least of which is his successful endeavor to show that Kant and Aristotle described the boundaries in which the modern discussion of life takes place. Furthermore, he indicates a tenable approach to the understanding of life, a gift to be used in correspondence with its intended aim and not a thing to be treated only as an object.

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*The Ten Commandments and Human Rights.* By WALTER HARRELSON. Philadelphia, Penna.: Fortress Press, 1980. 240 pages. \$9.95 (paper).

The antinomian "heresy" constituted a serious and unbridgable departure from normative Judaism in the early centuries of the Christian era. Paul's emphasis on grace, seemingly at the expense of obedience to the Law, made any attempt at reconciliation useless. The intervening centuries since then did not help in understanding as both Jews and Christians succumbed to a facile stereotyping of each other's faith.

That Paul himself had an understanding of the Law was generally overlooked by Jews as was the importance of "works" in determining the measure of a Christian. Judaism, in turn, was seen as a religion of dry and soulless legalism unredeemed by the benign quality of divine grace. Walter Harrelson, distinguished professor of Old Testament at Vanderbilt Divinity School, in the book under review, seeks to provide a basis for Jewish-Christian understanding, achieving it through a clear and reasoned analysis of the Decalogue and an indication of the role it can play in the reconstruction and redemption of contemporary society. The book is part of a series of studies for "all who care about the heritage of the biblical tradition" (p. xi) under the general editorship of Walter Brueggemann who credits our book's author with "combining careful, critical exegetical work with attentive discernment of the needs and options in the present social context" (p. xii). The praise is not unwarranted for Harrelson has made a thorough study of all the available material on the Decalogue, both modern and ancient, both Jewish and Christian, in his effort to establish, by reasonable exegesis, the intent and purpose of this incredibly rich guide for human behavior.

In the book's first part, Harrelson deals with some of the charges leveled against the Decalogue or presented to diminish its place as a reliable pattern for human behavior. He makes clear the crying need for appropriate norms in contemporary society and the dire consequences that have followed on the

neglect of these norms. We hear much of human rights these days without noting the inevitable corollary that rights enjoyed by one person impose obligations on others. We cannot, therefore, speak of rights without stating the consequent obligations, and all obligations, even when negatively formulated, involve the positive protection of the rights of others.

The author proceeds to as careful a formulation of the text of the Decalogue as modern scholarship makes possible. The historical context, Biblical and extra-Biblical, is examined as well as the question of Mosaic authorship. The investigation is thorough and informed and enables Harrelson to proceed to a serious consideration of each commandment, enlarging on its meaning in what he understands to be the nature of the ancient Israelite covenant with God. Here, I think, Harrelson manages to escape a trespass to which many have succumbed: to read eisegetically his own or Christianity's doctrinal and dogmatic concerns. To this reviewer especially, it was refreshing to read a study of the Decalogue not calculated, *ab initio*, to reduce the Old Testament tradition to nothing more than a prelude to the New Testament tradition.

The commandments are considered in four general divisions. What is called by Jews the first commandment is recorded here as a profound and necessary prologue, not to be numbered among the ten. Nor is it truly a commandment. It is a statement that puts all that follows in the context of human experience of the divine and of divine concern for the human. Commandments one, two, and three, the first division, represent God's exclusive claims, the acknowledgement of which is necessary to give sanction and authority to what follows. There are to be no other Gods, no Image of God, and no misuse of God's power. The second division, comprising the fourth and fifth commandments, called "God's Basic Institutions," demands a proper regard for the meaning of rest and concern for family in all its implications. The sixth and seventh commandments are designated as "not contempt for human life" and "no contempt for sex" (pp. 107, 122). These are referred to as "Basic Human Obligations" as commandments eight, nine, and ten are referred to as "Basic Social Obligations."

From the foregoing, Harrelson moves to what is his significant contribution, the examination of the conditions in our contemporary society that cry out for correction and concern. We begin to see clearly the critical role that can be played by the Decalogue in ameliorating some of the distressing evils of our own time. While occasionally homiletical, Harrelson is never objectionably so. He never loses sight of his objective of providing a reasonable, but not dogmatic, a strongly felt, but never strident call to strive for the best of which humans are capable.

In his section on "The Ten Commandments and the New Testament" Harrelson places the Decalogue appropriately within the early Christian tradition and places that tradition within its appropriate Jewish antecedents. He does justice to both faiths while constructively challenging each.

To Harrelson the Decalogue is a "Charter of Human Freedom" and a fairminded reader of whatever inclination is constrained to agree. Harrelson sees in bondage to God the only true freedom and quotes a gospel song to make his point:

Make me a captive, Lord,  
And then I shall be free;  
Force me to render up my sword  
And I shall conquerer be.

To this reviewer's mind there come immediately the words of a Mediaeval Hebrew poem:

Servants of time are slaves of slaves  
 The servant of God alone is free.  
 When each soul therefore seeks its lot  
 My soul saith, "God, my lot shall be."

A salutary and much needed study of the greatest of our religious treasures, this book deserves the widest possible audience, including the readers of *Zygon*. The reconciliation of religion and science is mediated through the language of reason. This is a most reasonable statement of a much misunderstood and much abused guide for creative and uplifted human behavior.

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*The Philosophy of Moral Development: Moral Stages and the Idea of Justice*. Vol. 1 of *Essays on Moral Development*. By LAWRENCE KOHLBERG. San Francisco: Harper & Row, 1981. 441 pages. \$20.95.

This is the first of three volumes which will report the theory of moral development of Lawrence Kohlberg and his associates at the Harvard University Center for Moral Education. Volumes two and three will address the themes of the psychology of moral development and moral education. For educators, both secular and religious, philosophers and theologians of the moral life, and psychologists, this series will represent the culmination of a long-time desire to have in one set of volumes a definitive statement of the provocative and important research of Kohlberg on moral development.

The impact of Kohlberg's work has been of such significance that those working on theories and models of moral development or moral education cannot approach their task without familiarity and consideration of it. Until this volume, those interested in Kohlberg's work have had to search through myriad books and journals to find the latest statement. Now it can be seen as a whole, and the manner in which Kohlberg relates the parts can be discerned in the organization of these volumes.

However, those awaiting the definitive Kohlberg may be disappointed, for this volume is largely a compilation of previously published articles. Only the introductions to each section of the book, chapters five and nine ("Justice as Reversability: The Claim of Moral Adequacy of a Highest Stage of Moral Judgment" and "Moral Development, Religious Thinking, and the Question of a Seventh Stage" with Clark Power), and the epilogue ("Education for Justice: The Vocation of Janusz Korczak") were unpublished. Future volumes also will consist of some previously published materials. The problem many will feel with this approach is that today Kohlberg himself analyzes some of the material differently than it is presented in these earlier articles. Consequently, there are inconsistencies, particularly of stage scoring, between the manuscripts. In the

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introductions to each section, Kohlberg tries to make readers aware of these shifts. For example, in the introduction to part one ("Moral Stages and the Aims of Education"), he states that the descriptions of the stages in chapters one and two ("Indoctrination Versus Relativity in Value Education" and "Education for Justice: A Modern Statement of the Socratic View") are outdated; nevertheless, this may be confusing to the reader in understanding the present state of the research.

It is, however, possible for one to make a much more generous assessment, as I do, of this procedure. What it communicates is the openness and development of the theory. Kohlberg is clear that his view is not final nor comprehensive (pp. xxv, 30) and that he is encouraging continuing reflection on the moral life and moral education. The presentation therefore reflects the openness, seriousness, and dynamism of Kohlberg's research. It invites the reader to participate in the ongoing reflection on morality.

This particular volume powerfully presents Kohlberg's philosophical principles and the sources of his thought. More clearly than many scholars engaged in empirical reflection on the elements of human personality, Kohlberg demonstrates that research is rooted in philosophical reflection about reality, knowledge, and the good (pp. 97-98). Philosophical reflection sets boundaries for the researcher by focusing the project and by providing perspectives by which the research proceeds and is interpreted. The way to approach objectivity, it is argued, is not to claim value neutrality, but rather to be transparent about the philosophical analysis guiding the research and to hold it up to public scrutiny. This is precisely what Kohlberg does by demonstrating his rootage in the tradition of Plato, Immanuel Kant, John Dewey, Jean Piaget, and John Rawls. To oversimplify, his structures for moral reasoning are related to Plato, Kant, and Piaget, his interactionist theory to Dewey, and his guiding principle of justice to Rawls. Kohlberg's stance within the Western liberal ideology is made transparent. Therefore, it is possible to interact publicly with the theory by comparing analyses from alternative philosophical, or more fundamentally ideological, frames of reference.

Moreover, Kohlberg makes clear the intended purpose and effect of his research—to enhance procedures for moral development and moral education. As he states, "theory and research in psychology that do not directly address issues of practice are more than sterile—they are misleading or vague in real meaning" (p. xxv). For Kohlberg, the primary concern is with practical philosophy, with enabling persons to contribute to the development of moral judgment. Through this procedure Kohlberg demonstrates how all research begins in philosophical reflection as to perspectives and ends in philosophical reflection as to meanings and action.

To respond to this volume comprehensively is almost impossible in a review length essay, for it demands attention to the corpus of Kohlberg's work. Such a thorough analysis has been engaged elsewhere: Craig Dykstra, *Vision and Character: A Christian Educator's Alternative to Kohlberg* (New York: Paulist Press, 1981); James W. Fowler and Antoine Vergote et al., *Toward Moral and Religious Maturity: First International Conference on Moral and Religious Development* (Morristown, N.J.: Silver Burdett, 1980); Brenda Munsey, ed., *Moral Development, Moral Education, and Kohlberg* (Birmingham, Al.: Religious Education Press, 1980); and *Stage Theories of Cognitive and Moral Development: Criticisms and Applications*, Harvard Educational Review reprint no. 13 (Cambridge, Mass.: President and Fellows of Harvard College, 1978). Many of these address the

empirical method, philosophical foundations, universality, and stage sequencing reflected in Kohlberg's research. Instead of repeating these conversations, let me focus on two other issues which encourage further research: Kohlberg's notion of the role of community in moral education and development, and his separation of religion and ethics.

First, a primary contribution of Kohlberg's work is the focus on the interactive dimensions of moral development between individual personality development and the community, and the conviction that a just community is essential to development in morality (pp. xxi, 4). Kohlberg demonstrates that any theory of morality that simply rests, no matter in how sophisticated a manner, on maturation or socialization misses the power of development. Rather we are forced to address how development, in all its facets, is an interactive process, and particularly how the quality of community life stimulates morality. While this theme will be developed fully in the third volume *Education and Moral Development: Moral Stages and Practice* yet to be published, it permeates the discussion of the aims of education, and of legal and political issues. Beyond being rooted in philosophical principles, it emerged in Kohlberg's reflection on and experience in education in a youth reformatory, kibbutz, and school.

We are pointed to the structure which is imposed by the hidden moral atmosphere of a community and how this stimulates or blocks growth in moral reasoning capacity. Beneath these assumptions is Kohlberg's own commitment to the liberal tradition reflected in democratic communities which emphasize equity, public conversation and resolution of conflicts, and individual and social justice. It is his conviction that this type of community best provides the conditions for stimulating moral development. The importance of these notions is that they require us to look at the moral climate embedded in our institutions, communities, and cultural life.

While moral development can be stimulated within educational environments embodying Kohlberg's principles, we need to look further and ask: What is the effect of this education on the general public in societies, like most of the Western democracies, which prize these values but reward conventionality and punish nonconventional thinking? How this education in one arena of people's lives contributes to their shaping of the public order or effecting the general character of justice in society is still unclear. Is it not possible that the moral climate of the wider culture will blunt the movement to postconventional morality? A broader theory of community morality is still to be articulated.

However, directions for such a theory are suggested in Kohlberg's work. A broader theory of moral effect would need to be based on the function of mediating (intermediary) social structures and institutions. One study suggesting such a pattern is Peter L. Berger and Richard John Neuhaus, *To Empower People: The Role of Mediating Structures in Public Policy* (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1977), which articulates the processes by which the structures of neighborhood, family, church, and voluntary associations mediate the individual's participation in the wider political order. These mediating structures provide contexts for moral education and also empower and support people as they encounter the conventionalities and pluralism present in the wider political and social order. Moving beyond Kohlberg's contribution, research is necessary to uncover the linkages between these formative and supportive communities and the wider society with the vision of enabling a more just society operating out of more comprehensive processes of morality.

Second, Kohlberg tends to follow Kant and Dewey in separating religion from ethics. He is probably accurate in contending that most theories which attempt to see these as one function in a sectarian manner. Kohlberg wants to avoid this and argue that the religious questions, "Why be moral? Why be just in a universe that is not manifestly just?" (p. 308), are both present at every stage of moral development and simultaneously beyond moral development providing it with vision, power, and destiny. Therefore, he argues morality is necessary but not sufficient for religious development.

The question is whether Kohlberg's definition of religion is comprehensive enough. Many historians of religion and theologians argue that religion is not limited to religious institutions but is reflected in all ideologies, Marxism and even the Western liberal tradition function as religions. Moreover, they argue that the essential issue is not religion but faith, as does Wilfred Cantwell Smith in *Towards a World Theology: Faith and the Comparative History of Religion* (Philadelphia: Westminster Press, 1981). Faith is the more comprehensive term beyond religion. It is a constitutive human process by which all people organize their experiences from the perspectives of personality, environment, religious and ideological traditions, and the transcendent reality (Smith, p. 26). Faith then is the human way of meaningfully organizing experience into interpretative ideologies, represented in religious frames of reference as well as those of the humanisms, and of seeking to live faithfully according to these ideologies.

Of course, the underlying human structure is only observable through particular expressions of people and their traditions. The truth of this statement is reflected in the contemporary research to uncover these structures of human faith in James Fowler's *Stages of Faith: The Psychology of Human Development and the Quest for Meaning* (San Francisco: Harper & Row, 1981) which has been influenced by Kohlberg's work. Fowler is able to present the first four stages of faith as general abstractions, but stages five and six take on the character of his own religious ideology. The same is true of Kohlberg. In his quest for understanding the constitutive structures of human morality what is most clear is his particular "religious" ideology represented in the convictions of fairness, justice, and equity drawn from the Western liberal tradition. The presentation of the general abstract structures is clearly cast in this particularity.

The essential question is the human process of constituting faith, of constructing a semantic universe in which meaning, morality, and faithfulness make sense and provide direction to living. Our faiths are seen most clearly in the convictions we take for granted, in the images we use to interpret experience, in the symbols which collect and focus primary meanings, and in the narratives we use to link the images and symbols. The power of any faith is not seen in the general abstraction of structures but in the particular expressions which enmesh these structures.

What is at least needed is reflection on how moral development relates to the development of faith instead of just how morality relates to sectarian religion. But more importantly, attention still needs to be given to how the structures of human faith manifest themselves in the religious ideologies and how persons within these varying ideologies relate to each other in their mutual endeavor of morality and faith. One productive direction is reflected in Smith's work. In addition, attention needs to be given to the role of images, symbols, and narratives in forming faith and in enabling human conversation at the level of faith. This agenda is one to which Kohlberg's work has made a significant

contribution. Observation of the process from the liberal tradition is important to all of us who stand in this tradition.

The hope is that Kohlberg's research and that which it has inspired will encourage others to move out into these broader questions. This volume in Kohlberg's series on moral development provides a means for us to have significant research available in one place. More than this, it is our invitation to participate in ongoing conversation about the moral life and about ways humans enliven morality and faith in ideological traditions.

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*The Primordial Bond: Exploring Connections Between Man and Nature Through the Humanities and Sciences.* By STEPHEN H. SCHNEIDER and LYNNE MORTON. New York: Plenum Press, 1981. 324 pages. \$15.95.

According to its subtitle, this book promises to scout the relatively uncharted regions which lie between the two cultures of the humanities and natural science. The explicit expectation is that soundings taken in this area will produce new conceptual resources for response to the complexities of the global environmental crisis. The authors—one a humanist by training, the other a concerned climatologist—deliver on this promise more effectively and with greater insight than many recent books in this genre.

Lynne Morton, the humanist, is obviously responsible for the first four or five chapters. Her thesis is that classical mythology, works of art, literature and drama, and ancient philosophy are legitimate inquiries into the structure and patterns of the natural world. The unique dimension of a humanistic analysis of this material lies in its ability to explicate value judgments and to communicate the affective or feeling ingredient of the human encounter with natural environments. To this end, a real advantage of the book is the inclusion of twenty-six illustrations of works of art ranging from a Buddhist mandala to Claude Monet's multiple paintings of the cathedral at Rouen. Each is discussed in a separate extended caption and related back to the larger theme.

Morton's working assumption is taken from Jacob Bronowski. In *Science and Human Values* (New York: Harper & Row, 1956), Bronowski identifies a common element in the methods of the arts and natural science, namely that each is a creative attempt to discover unity in diversity. The distinction between the two approaches lies in what they do with this unity once discovered. The "speculative" sciences, the humanities, do not necessarily seek verification of their findings. The nonspeculative sciences, science as such, employ prediction and verification to refine their theories in a continuous and convergent approach toward truth.

The authors recognize that a sudden shift from the tender-minded approach of the humanities to the tough-minded efforts of the sciences would leave the impression that the book is not truly interdisciplinary. So they attempt to build a bridge constructed of themes or concepts common to both modes of inquiry. These themes include the notion of recurring cycles as a basic pattern

in nature and the presence of the four fundamental elements: earth, water, air, and fire. Ancient wisdom enshrined the circle—the symbol of circles—and spoke, for example, of both death and rebirth. Science likewise detects cycles of earthly elements (carbon, phosphorous, and sulfur) as well as those of water and air (nitrogen).

The one absolutely critical exception is fire. Steven Schneider, whose perspective is elaborated in the latter chapters of *The Primordial Bond*, confesses that the laws of thermodynamics are unexceptionable. Energy once used dissipates as heat and is never again available for effective work. Alas, an important, almost overwhelming linear decay corrupts the otherwise universal and unifying concept of cycles. Entropy competes with the cycle as a symbol and idea counseling our conduct. Jeremy Rifkin's *Entropy: A New World View* (New York: Bantam, 1981) probably should be read as a companion volume in this respect.

The final chapters chronicle human disruption of natural cycles and advocate a "social tithe," a significant contribution in resources and action to the healing and sustenance of global cycles. Several alternative scenarios for such a tithe are presented, all of which focus on reducing the severity of the disruption.

Despite efforts to bridge the gap between the two cultures, the book suffers somewhat from compartmentalization. This is an inherent risk when two writers with widely divergent competences take turns. Overall, however, *The Primordial Bond* remains a comprehensive introduction to the many resources which can be brought to bear on the problems of reconciling humankind to the natural order.

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*Knowledge and the Sacred.* By SEYYED HOSSEIN NASR. New York: Crossroads, 1982. 228 pages. \$19.50.

For an Oriental Muslim to be invited to give the prestigious Gifford Lectures is interesting; for the audience to respond with spirited discussion is newsworthy. Formerly professor of the history of science and philosophy at Tehran University, Seyyed Hossein Nasr had moved to the religion faculty of Temple University by the time he arrived in Edinburgh in 1981. Nonetheless, he had decided to be a spokesman for tradition, for the recovery of the sacred by the rediscovery of "principial knowledge," and that is what attracted an attentive audience for the lectures and now for his book. Tradition, which "like a living presence . . . leaves its imprint but is not reducible to that imprint," (p. 67) comprises truths or principles of divine origin (p. 67). One tradition, the primordial tradition, "always is" although it takes on a multiplicity of forms. Amid his own poetic expressions he quotes the lines of Jalal al-Din Rumi:

Consider creation as pure and crystalline water  
In which is reflected the Beauty of the Possessor of Majesty;  
Although the water of this stream continues to flow  
The image of the moon and the stars remain reflected in it (p. 271).

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The scope of Nasr's lectures is impressive. He calls for the recovery of the "sapiential tradition" to counteract "the reduction of intellect to reason and the limitation of intelligence to cunning. . ." (p. 4). He outlines a *scientia sacra* of metaphysics, as "the science of the real," enabling one to "know things not merely as they appear but in their essence or as they are . . . *in divinis*" (p. 133). The affirmation of the unity and ideality of all things in God provides the basis for Nasr's critique of the "modern world"; it is Promethean in its rejection of Heaven and chaotic in consequence. In the process, the world has lost its meaning and man his dignity. Nasr's challenge is that we do nothing less than live another metaphor—not of Prometheus but of the *pontifex*.

From the traditional point of view the human role is by no means minor; man is the *pontifex*, the bridge between the ideal and the real, the *khalifatallah*, the vice-regent of God in caring for the world. Human nature gains its stature in being theomorphic, with intelligence capable of knowing truth, sentiments able to reach toward the Ultimate, and a will whose capacity to choose mirrors the divine freedom. What is more, man possesses "that miraculous gift of speech through which he is able to exteriorize the knowledge of both the heart and the mind," reflecting "the Logos which shines at the center of his being" and able "to formulate the Word of God" (p. 176).

In the analysis of mysticism and religion Nasr offers careful correctives to simplistic solutions: God is both immanent and transcendent "but He can be experienced as immanent only after He has been experienced as transcendent." Nasr explains: "Only God as Being can allow man to experience the Godhead as Supra-Being," which is to say that only through the encounter with God as He makes Himself available in a particular tradition can one appreciate His ultimacy (p. 137).

Nasr's insight here enables him to work out a way for the "traditional method" to "go beyond both polite platitudes and fanatical contentiousness" in dealing with the encounter of world religions (p. 303). Following Fritjof Schuon's notion of "the transcendental unity of religions," he points out that the multiplicity of sacred forms need not be seen as discrediting religion but ought to be understood as demonstrating the rich creativity of the Sacred. His key dictum is that "to have lived any religion fully is to have lived all religions" (p. 296), a point he explains more thoroughly in his book *Ideals and Realities of Islam* (Boston: Beacon Press, 1972), where he identifies the quintessential religious characteristic as obedience or surrender to the Divine Will. Obviously, a turning away from one's own tradition would rarely qualify as obedience.

The points of lively dialogue with a Muslim theologian extensively informed about patristic and medieval Christian theology are many, but points of confrontation arise as well. An example is the interesting notion of the "relatively absolute," that which though rightly regarded as absolute within a particular tradition remains but relative to the Absolute in itself. Holding Christ as the Logos is understandable for Nasr from the religious point of view but not from the metaphysical, where "only the Godhead in its Infinitude and Oneness is above all reality" (p. 294). This statement discloses a theological context as much as a metaphysical idea—it sounds very Muslim. Would not its image of Allah and the Qur'an which witnesses to it be relatively absolute as well?

A more extensive encounter with Nasr's position comes in his treatment of science. Already in his opening pages we read that "profane science" cannot adequately study sacred doctrines and soon we sense an emerging critique of the reduction by the modern mind of the rich complexity of experience to

unidimensionality. The cosmos is no longer seen in terms of symbolic theophany; it is reduced to mere quantities of mass and motion. But as he develops his critique of modern science Nasr is torn by a contradiction: on the one hand he claims that science has refused to accept boundaries for its activities while on the other he asserts that it neglects any "higher states of being" or orders of reality other than its own. While this may be true of scientism and popular misconceptions, it seems that the scientists most of us know accept boundaries to their methods. Nasr soon transgresses boundaries on his own, accusing scientists of extrapolating physical laws back in time using a "uniformitarian" methodology without regard for cosmic cycles, thus postulating events 500 million years back. Apparently, he wants to believe quite literally in the creation of the world in six days a few thousand years ago. His argument is not unlike the following: if an all-knowing, all-powerful God wants to create a 4,000 year old fossil to show up in carbon-dating tests as five million years old, who is to say he cannot do it? Well and good, but would you want that kind of ideology to run an airline?

In the section on "Eternity and Temporal Order" one soon discovers that it is evolutionary theory which Nasr really wants to attack. He implies that biology contradicts traditionalism by asserting that man "ascends from the ape" over against the sapiential insistence that man "descends from a celestial archetype" (p. 236). Nasr makes a categorical error here: if science is to operate on the horizontal plane of existence it can make no assertions about ascending and descending on the vertical one and in fact does not in evolutionary theory. Nasr goes on attempting to discredit evolutionary theory on scientific grounds by citing the works and arguments of the creationists who similarly confuse the categories of faith and scientific knowledge in their desire to teach the Bible in biology classrooms.

But the most vicious attacks are reserved for Pierre Teilhard de Chardin, responsible for the "Darwinization of theology and the surrender of this queen of the sciences to the microscope" (p. 240). Nasr terms his work idolatrous in devouring the Eternal in the temporal process and in worshipping the world of matter. To be sure, Teilhard's assertions warrant extensive analysis and much criticism, but no one who has read *The Divine Milieu* (New York: Harper & Row Torchbook, 1968) can doubt the fact that a religious vision informs all his work and no one who knows *The Phenomenon of Man* (New York: Harper & Row Torchbook, 1965) can imagine that the Omega Point can be swallowed up in a temporal process. An examination of Nasr's references indicates that, indeed, his treatment of Teilhard is based on secondary sources. Nasr wants to deal with important issues of science and secularization, but myopia of the right eye can hardly serve as a cure for myopia of the left.

In the end, Nasr the prophet of tradition is seen to be its captive. He no longer can see the image of the moon in the waters because he believes the stream is gone. From the perspective of the history of religions that is the principal criticism. Tradition is here too narrowly defined. Tradition is not an entity over against which another entity, modernism, stands in opposition, for modernity also has its roots in tradition. A living tradition will be conscious of its origins and maintain its commitments but will not close itself off from contact with the new.

From the theological perspective the principal criticism is that the essential difficulty with Nasr's work is in his notion of revelation. Paul Tillich criticized Karl Barth's theological positivism by claiming that for Barth revelation is

“thrown like a rock” into the world. Similarly, revelation for Nasr is always orthodox and never to be questioned. More realistically, revelation is understood as not separable from the form and language in which it is expressed, that is, from the products of human culture, creativity, and experience. The miraculous gift of speech through which the knowledge of the heart and mind may be exteriorized gives revelation its concreteness but at the same time subjects it to human limitations as it opens itself to human potentials. We will want to persuade Nasr that such a view gives human beings the full task of the *pontifex*, providing an honored role for human creativity. Perhaps we may go beyond the point of confrontation to the place of dialogue again, for we would wish to urge Nasr to become fully open to Rumi’s continuing stream and thus see again the reflection within it.

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*Green Paradise Lost*. By ELIZABETH DODSON GRAY. Wellesley, Mass.: Roundtable Press, 1981. 166 pages. \$7.95 (paper).

In recent years the feminist cultural critique has established a permanent place in the intellectual landscape. Drawing on the best feminist scholarship in the social sciences and humanities, Elizabeth Dodson Gray’s search for a feminist environmental ethic has produced a book as difficult to classify as it is provocative and stimulating to read.

Gray, theologian and environmentalist, is presently codirector of the Bolton Institute for a Sustainable Future and coordinator of the Theological Opportunities Program at Harvard Divinity School. In format and style her book is well suited to the classroom; beyond this, however, it would provide a useful introduction for laypeople and a valuable source book for professionals in various disciplines interested in the development of an ecologically responsible ethic and spirituality. Gray’s unique contribution to this enterprise is her ability to synthesize insights from fields as various as physics, marine biology, cultural anthropology, social psychology, philosophy of science, and process theology.

The book divides into two parts: first a diagnosis of and second a prescription for what Gray perceives to be our social and ideological malaise. Part 1, “The Fall into Illusion,” suggests that patriarchal culture “has erroneously conceptualized and mythed ‘Man’s place’ in the universe and thus—by the illusion of dominion that it legitimates—it endangers the entire planet” (p. ix). Exploring the mythic and psychosexual roots of the ecological crisis, Gray investigates the connections between sociopsychological oppression and environmental exploitation and concludes that inherited patriarchal values, perceptions, and practices are inadequate for constructing a viable environmental ethic. One example of this is our continued reliance on the notion of “responsible stewardship.” This perspective derives from a creation tradition which is alternately anthropocentric and hierarchical and which legitimates unnatural arrangements of power and value. In the anthropocentric pattern of Genesis 2, all things are created around the male as functions of his life, the meaning and value of their

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existence being determined in relation to him. The hierarchical paradigm (e.g., Gen. 1 and Ps. 8:3-8) places God and men at the top of a cosmological pyramid and propagates a sense of spiritual, ontological, and axiological "up-and-down-ness" (p. 3). This perspective, in which difference always translates into degrees of superiority and inferiority, remains one of the most pervasive though anachronistic root metaphors in our culture.

Secular and theological treatments of evolutionary theory are often merely sophisticated reenactments of this ancient paradigm. What Charles Darwin had visualized as *The Descent of Man*, suggesting our kinship with our animal forebears, has been transformed in the popular imagination into Jacob Bronowski's *Ascent of Man* (p. 6). Despite the tenacity of traditional conceptions, however, the emergence of new paradigms in the natural and social sciences calls for new ethical and religious modes of apprehending and interacting with reality. "However 'dominion' is interpreted it always means 'above' and implies a right to exercise power over others" (p. 2). No conception which institutionalizes inequality can provide a durable stay against the misuse of power.

Part 2 of Gray's book, "Whole and Home Again," investigates the usefulness of recent developments in the natural and social sciences as conceptual resources for the kind of ethical and spiritual renewal which can provide for a responsible environmental policy. The early chapters of this section take us on a rapid journey through three hundred years of conceptual development in physics and biology. Relying heavily on Fritjof Capra's *The Tao of Physics* (Berkeley, Calif.: Shambhala Publications, 1975), Gray sketches the process by which the Cartesian/Newtonian universe was supplanted by that of quantum and relativity theory. Modern science obliges us to picture reality as "a complex and dynamic web of energy relationships," precluding the alienating paradigms of a patriarchal culture. "Reality is not Cartesian. It is not partitioned. It is not hierarchical. It does not consist of builders and building-blocks, observers and observed, doers and done-to" (p. 67).

In the biological and social sciences many applications of Darwinism have had the same atomizing effects as did the classical view of physics. But, says Gray, "some reputable scientists today look at nature and see coordination and symbiosis as more fundamental than conflict" (p. 70). The new biological paradigm, which is complementary to the perspective of modern physics, is that of ecology; this "is the scientific discipline which has finally become a lens for seeing and describing the connections in the biosphere. What ecology helps us see is an earth covered with a vast array of ecosystems, both large and small, continuously interacting with one another in many ways which are not immediately obvious to humans" (p. 71). An ecological perspective can support a "whole-system ethic" (p. 76) which reveals the self-destructiveness of "enlightened self-interest." Our systems of interdependence—biological, social, and international—are so complex that we can no longer afford to think and act parochially. In the modern world "it is no longer simply altruistic or religious to 'Love your neighbors' or, as Jesus counseled, to 'Love your enemies.' This perception (the ecological) of our world and its web of connections so enlarges the scope of our self-interest that . . . for the first time in history, morality has become pragmatic" (p. 78).

Gray finds in the ecological model a conceptual resource for the analysis and feminist critique of modern forms and practices ranging from child-rearing and family arrangements to architectural and urban design. Here again she

draws liberally on the works of such scholars as cultural anthropologist Nancy Chodorow, *Woman, Culture, and Society* (ed. M. Z. Rosaldo and Louise Lamphere [Stanford, Calif.: Stanford University Press, 1974]) and social psychologist Dorothy Dinnerstein, *The Mermaid and the Minotaur* (New York: Harper & Row, 1976), as her investigation becomes a virtual roadmap of the influential research in her field.

Despite the intricacy of her argument, however, Gray does not ultimately rely on the emergence of new paradigms for the development of a responsible environmental policy. Her book derives from a highly personal spiritual vision, which nevertheless has more than individual application. She does not hope for an enduring environmental ethic apart from a newfound sense of the validity of those aspects of experience which we have traditionally ignored or repressed. This new sensibility originates in a rediscovery of the body as the seat of spirituality and an awareness that "our fully sensuous body is the erotic connection to our world which we have been lacking. We know our living is part of the earth's living systems—that we are rooted in the earth and sensually in dialogue with it. Is it possible that intuitive wholistic awareness has as nerve endings our human skin?" (p. 93). The first step to recovery of the "lost dimensions of human identity" (p. 79) is to perceive ourselves as "biospiritual organisms" (p. 82). This phrase from theologian Kenneth Cauthen's "Toward a Theology of the Body" (xerox [Rochester, N.Y.: Colgate Rochester Divinity School]) need not be applied only to humans but to all of matter and even to God. "Perhaps . . . God too is a biospiritual unity just as all life in God's creation has a biospiritual character. Perhaps there never is spirit without body and no body (or mass) without spirit. Is it in this sense that we are created in God's image?" (p. 82).

This is a very personal yet an extensively researched book which a variety of readers will find insightful and no doubt controversial. While few of its ideas are novel, its synthesis of feminist cultural critique and environmental concern is unique, sparking not only the impulse for further reading but indicating many significant resources for doing so.

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*Creation, Science, and Theology.* By W. A. WHITEHOUSE. Edited by ANN LOADES. Grand Rapids, Mich.: Eerdmans, 1981. 272 pages. \$10.95 (paper).

This book is a collection of eighteen essays, lectures, and sermons by W. A. Whitehouse, a Reformed theologian trained in mathematics and the natural sciences. He is currently a semiretired pastor of the United Reformed Church at Ravenstonedale, England. Thomas F. Torrance has described him as "one of the ablest theologians in the English speaking world." Heavily influenced by Karl Barth, Whitehouse endeavors to relate biblical faith to the empirical wisdom of the natural sciences.

Several of the essays are interpretations of various sections of Barth's *Church Dogmatics*. Whitehouse concurs in Barth's strictures against natural theology,

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but he nonetheless sees a place for a "theology of nature." This is understood as a theological account of natural happenings, happenings which are properly investigated by the various natural sciences. A theology of nature looks at the world with "the hope of recognizing *hints* of grace" (p. 192). Against the Gnostic depreciation of the natural world, Whitehouse affirms the world as created by God and reflecting the glory of God. Yet this derivative or reflective light of God in the world of creatures can only be truly recognized and duly appreciated by those whose inward eyes have been opened to the divine source of this light—Jesus Christ.

Whitehouse gives an engrossing and sympathetic treatment of Barth's theory of evil. While the Gnostics and Manichaeans traced the source of evil to the principle of materiality, Barth steadfastly contends that the whole of creation is good, even though it is limited or finite. Barth sees the source of evil in what God negates rather than in what he affirms, in *das Nichtige*, the chaos or darkness which is given only a provisional existence by God. This chaos does not belong to the creation as such, but it is a negated reality that casts a shadow over creation. It has been decisively defeated by Jesus Christ, not only in his cross and resurrection victory but in the original divine act of creation. Whitehouse translates *das Nichtige* as "the Void," which, in my opinion, is not the most helpful rendition. It is better described as the undercurrent of disruption or "chaotic insubstantiality" (a term suggested by Whitehouse's wife) which threatens creation by undermining the principle of order and harmony in creation. It is not so much the absence of being as an assault upon being. Whitehouse maintains that the Nothingness is characterized by a privation of grace rather than a privation of being.

The author also affirms with Barth that both state and church belong to Jesus Christ. He disputes Rudolf Bultmann's belief that these represent fundamentally different spheres and that Christ's rule can therefore only be considered spiritual and not also political. Whitehouse also argues against that stand in Roman Catholicism that subordinates the state to the church. The state has a relative but not an absolute autonomy, and its decisions, too, are therefore subject to the Lordship of Jesus Christ.

There is an excellent chapter by Whitehouse on sanctity and worldliness in the Bible. He definitely goes beyond Barth in sounding the call to sainthood and in seeing this in terms of a visible separation from the values and practices of secular society. Barth also affirmed the need for costly discipleship under the cross, but his emphasis was on Jesus Christ alone as the model of sanctity. Whereas Whitehouse characterizes the Christian life as one of "well-doing," Barth was more apt to describe it in terms of faithful obedience to Jesus Christ.

Like Barth, Whitehouse is basically optimistic, since he sees the providential hand of God everywhere in the world and believes that all peoples are already under the Lordship of Jesus Christ. The kingdom is present now, though veiled to those who choose to walk by their own light rather than by the light of Jesus Christ. In his view, the presence of the kingdom is manifest through divinely given signs, which make its recognition possible but not inevitable.

Whitehouse acknowledges that there can be no final science or final theology. Yet he pleads for "a definitive exegesis, to which we can commit ourselves without any disquiet about our intellectual integrity" (p. 147). Following Barth, he is adamantly opposed to relativism in theology, although he candidly recognizes that theological formulations must be constantly revised—but always in the light of the infallible norm of the Christ revelation attested to in Holy Scripture.

Whitehouse's writings are significant because they show that it is possible to be fully alive to the latest findings in the natural sciences and still contend for a supernatural life- and world-view. He urges theologians to strive for greater competence in politics and sociology as well as in the natural sciences. Thus equipped, they will be in a position to present a unified vision of life to many moderns who are groping for a transcendental meaning that will give direction to and indeed challenge their existence in a secularized, technological society.

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*From Being to Becoming: Time and Complexity in the Physical Sciences.* By ILYA PRIGOGINE. San Francisco, Calif.: W. H. Freeman & Co., 1980. 272 pages. \$25.00, \$12.50 (paper).

Ever since the early work of Ludwig Boltzmann and Josiah Gibbs, physicists as well as philosophers have been pressing the question of how an assembly of time-reversible microscopic events can statistically sum to time-irreversible macroscopic behavior. Although these two pioneers have provided a classical framework for explaining such phenomena, many questions and ramifications have remained to be explored. In *From Being to Becoming*, Ilya Prigogine directly brings to bear quantum mechanics and a lifetime of experience in nonequilibrium thermodynamics on this and related problems to provide a link between the microscopic and macroscopic regimes. He does this by outlining an encompassing formalism that extends the domain of phenomena ordinarily described by time-reversible classical and quantum mechanics to domains generally including time-irreversible, nonequilibrium thermodynamic phenomena. It is a bold statement that physical theory of the real world should not simply consist of the traditional classical and quantum mathematical structures with ad hoc phenomenological equations to cover thermodynamics but instead should be a much larger structure embracing both time-reversible and time-irreversible phenomena.

In the preface he states the three principal theses of the book: (1) "irreversible processes are as real as reversible ones" and are not described by supplementary approximations superposed on time-reversible laws; (2) "irreversible processes play a fundamental constructive role in the physical world" and can generate important coherent, ordered effects, especially apparent in biological phenomena; and (3) "irreversibility is deeply rooted in dynamics" and "starts where the basic concepts of classical or quantum mechanics (such as trajectories or wave functions) cease to be observables." Irreversibility is not characterized by "some supplementary approximation introduced into the laws of dynamics, but to an embedding of dynamics within a vaster formalism" (p. xiii).

Prigogine sees the domain of phenomena describable by classical and quantum mechanics as a rather rigid idealized world of "being." He claims that irreversibility "introduces unexpected features that . . . give the clue to the transition from being to becoming" (p. xix). Indeed, he feels that the most

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significant conclusion of the book may be that irreversibility commences where classical and quantum theory reach their limits.

The content of the book is introduced by a chapter discussing time in physics, the reversible phenomena of dynamics and irreversible processes of thermodynamics. The remainder of the text is divided into three parts which he entitles "The Physics of Being," "The Physics of Becoming," and "The Bridge from Being to Becoming." These are followed by four appendices which furnish some explanatory details of his formalism.

In "The Physics of Being" Prigogine lays the groundwork in the first two chapters for establishing his three theses. The first, on classical dynamics, deals with Hamiltonian and ensemble theory as well as the question of integrability and ergodicity of systems. In the second chapter on quantum mechanics, besides presenting some fundamentals, he treats ensemble theory and the problems of measurement and of time development in quantum theory.

"The Physics of Becoming" is comprised of three chapters, the first of which, on thermodynamics, mainly discusses entropy along with stability and linear nonequilibrium in the theory of thermodynamics. The next chapter describes processes far from equilibrium where probability theory is inapplicable. At some critical stage the system reaches a bifurcation point where, perturbed by a given fluctuation, it is progressively driven to a coherent state characterized by some form of order. Such bifurcations find examples in chemistry, biology, and even ecology. The subject of the last chapter in this part is nonequilibrium fluctuations, and it further deals with nonequilibrium phase transitions, critical fluctuations, and associated oscillatory phenomena.

Designed as a bridge between the concepts presented in part 1 (being) and part 2 (becoming), part 3 is introduced with a chapter on kinetic theory dealing with entropy and the work of Boltzmann and Gibbs. This chapter, which concludes with the interesting concept of a complementarity between dynamics and thermodynamics, provides the background for chapter 8, the most important in the book.

In chapter 8 Prigogine presents the essence of his formalism, the microscopic theory of irreversible processes wherein he introduces a microscopic entropy operator which, being ultimately related to macroscopic entropy, provides the link between microscopic and macroscopic physics and thus unifies dynamics and thermodynamics. In this formalism he uses a nonunitary transformation of the Liouville operator to develop a "new time evolution operator" with even and odd components corresponding to reversible and irreversible processes respectively, the same symmetry as in the Boltzmann equation. Here also the notion of "super operators" is introduced where, again via a nonunitary transformation, a "super Hamiltonian" is derived. Prigogine shows that this operator along with the time evolution operator separates the time development and energy eigenvalue properties of a quantum mechanical system, which are usually derived from a single Hamiltonian in conventional quantum theory.

The last chapter summarizes the work and discusses the time (in this case the Hermitian conjugate of the Liouville operator) and entropy operators. It also reviews how the various levels of physical description, classical and quantum, microscopic and macroscopic, are linked.

Understandably, Prigogine's effort touches on many interesting aspects of physical philosophy. For example, Prigogine feels that the role of determinism in macroscopic physics should be re-examined, noting that determinism pre-

vails between bifurcations. Life itself involves far-from-equilibrium processes, and he suggests that perhaps "the origin of life may be related to successive instabilities somewhat analogous to the successive bifurcations that have led to a state of matter of increasing coherence" (p. 123).

For Prigogine perhaps the most interesting aspect of his work is that time, reduced to a label in classical and quantum theory, now has a different meaning by being correlated with evolution. He maintains that the idealizations, characterized by reversibility in classical and quantum physics, extend beyond the possibility of measurement but that the irreversibility featured in his theory takes "proper account of the nature and limitation of observation" (p. 215). In this connection he feels that new aspects of the questions discussed in the famous Bohr-Einstein debate now appear, which make it possible to consider more complete, objective probability theories.

Prigogine's book is a well written and generally clear presentation of refreshing and stimulating concepts, supported with ample, well-designed illustrations. It is not a book that can be easily and completely understood by one who does not have some graduate background in thermodynamics and statistical mechanics. However, the lay scientist should not be discouraged from reading the book since he or she can scan some of the more detailed and difficult mathematical formalism. The book is a credit to Prigogine's imagination and physical intuition, and will undoubtedly provoke rich and extensive discussion both from a physical as well as a philosophical point of view.

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## *Notice*

The Foundation for Philosophy of Creativity announces plans for a new monograph in its series. This monograph is to be devoted to the philosophical assumptions and implications in the thought of the physiologist Walter B. Cannon. Contributions are welcome on any philosophical aspect of Cannon's work. The editors are especially interested in papers that (1) generalize the notion of homeostasis to other fields (e.g., metaphysics, ethics, esthetics); (2) compare the accomplishments and ideas of Cannon with those of Claude Bernard; and (3) assess the role of homeostasis within an evolutionary perspective. Individuals wishing to contribute should contact either Dr. Raymond D. Boisvert, Dept. Rel. and Phil., Clark College, Atlanta, GA 30314, or Dr. Pete A. Y. Gunter, Dept. Phil., North Texas State University, Denton, TX 76203.