Reviews

Christian Belief in a Postmodern World: The Full Wealth of Conviction. By DIOGENES ALLEN. Louisville, Ky.: Westminster/John Knox Press, 1989. 238 pages. $14.35 (paper).

Diogenes Allen is Stuart Professor of Philosophy at Princeton Theological Seminary and a Fellow at the Center of Theological Inquiry in Princeton. His book *Christian Belief in a Postmodern World* is rooted in other of his work, including *The Reasonableness of Faith* (Washington: Corpus Publications, 1968) and *Three Outsiders: Pascal, Kierkegaard, and Simone Weil* (Cambridge, Mass.: Cowley Publications, 1983). In the present book, he aims to show that "not only are the barriers to Christian belief erected by the modern mentality collapsing, but that philosophy and science, once used to undermine belief in God, are now seen in some respects as actually pointing to God" (p. 2). Moreover, human needs will motivate a rational person to consider the possibility of God. Active and open seeking may lead to "the full wealth of conviction" as a result of interaction with God.

Others have also recently argued against modern (Enlightenment) assumptions about rationality and for the reasonableness of Christian belief based, not on arguments drawn from philosophy, science, or history, but on experience of God. Essays on this subject by philosophers Nicholas Wolterstorff, Alvin Plantinga, George I. Mavrodes, and William P. Alston, for example, appear in *Faith and Rationality: Reason and Belief in God*, edited by Plantinga and Nicholas Wolterstorff (Notre Dame: Univ. of Notre Dame Press, 1983). Allen's discussion differs from these in addressing science as it pertains to the reasonableness of Christian faith. Thus the book will interest *Zygon*'s readers, since one of *Zygon*'s aims is to examine critically the theory and practice of the many manifestations of religion in light of the best contemporary scientific knowledge about human nature, society, and the world.

After summarizing his program in the introduction ("The End of the Modern World: A New Openness for Faith"), Allen argues, in part 1 ("The Book of Nature"), that science and philosophy neither undermine Christianity nor establish it, but raise questions about the existence and order of the universe that they do not answer. Chapter 1 ("The Christian Roots of Modern Science and Christianity's Bad Image") is devoted to showing that the effect of Christianity on classical science, though restrictive, was not wholly negative. In chapter 2 ("Has Science Replaced God?") Allen argues that, given a proper understanding of science and God's relation to nature, the existence of complete scientific explanations of nature not mentioning God would not imply the self-sufficiency of the universe. In chapters 3 and 4 Allen gives reasons to think that, while teleological and cosmological arguments fail to demonstrate God's existence, the order and existence of the universe point to the possibility of God as their source. In

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chapter 5 ("The Need for God and the Book of Nature"), Allen contends that "human needs lead us to call the world's existence and worth as the highest and best reality into question" (p. 85). Thus we may be led to "active consideration of the possibility of God," which in turn may lead to "appreciation of what the book of Scripture tells us about ourselves and God," from which "the response of faith may arise" (p. 85).

In part 2 ("The Book of Scripture"), Allen draws upon Pascal, Kierkegaard, Weil, Austin Farrer, and others to make a case for the reasonableness of Christian faith based, not on scientific or philosophical reflections about nature, but on experience of God's grace through the Christian community and the Bible. In chapter 6 ("The Experience of God's Grace: Faith and the Book of Scripture") Allen characterizes faith, not in terms of an absence of reason, but in terms of interaction with God. In chapter 7 he argues that Christian faith is reasonable, but also "above reason" in that it involves the will and so is beyond the mere exercise of the intellect. Chapter 8 concerns the relation of reason to God's revelation in Scripture. In chapter 9 Allen contends that those who consider biblical claims of divine action in nature and history to be mythological are "misinformed about the implications of modern science" (p. 167).

Part 3 ("Christianity and Other Faiths") lays the groundwork for considering the major non-Christian religions from the standpoint of Christianity. In chapter 10 Allen sketches an approach that "reaches out toward other faiths, retaining the conviction that Christ is Savior of the world, and bringing another faith or aspects of it into vital relation to Christ" (p. 187). Here and in chapter 11 ("Incarnation in the Gospels and in the *Bhagavad-Gita*") he develops some of Weil's ideas to illustrate this.

Allen makes creative use of a wide range of sources from history, science, philosophy, theology, and other disciplines. His book is accessible to practitioners in each of these domains, as well as to laypeople. This interdisciplinary scope and broad accessibility stands in marked contrast to many scholarly works addressing the rationality of Christian belief written from the standpoint of one discipline and with the specialist in mind. Many will welcome this attempt to find a reasonable alternative to obscurantism (ignoring the threat to Christianity posed by some Enlightenment assumptions), evidentialism (endorsing rigid Enlightenment requirements for reasonable belief), and relativism (rejecting the Enlightenment assumption of absolute standards of rationality and morality). Many will also find plausible his claims (*a*) that Christianity cannot be refuted or proven on the basis of science and philosophy alone, (*b*) that a rational agent, in order to determine whether his or her needs and desires are satisfiable, will consider the possibility that God is the source of the universe, (*c*) that an experience of God's grace is indispensable for the development and maintenance of Christian conviction, and (*d*) that a consideration of other faiths from a Christian perspective is an attractive alternative to the extremes of holding either that all religions are equally true or that there is nothing of value in non-Christian religions.

I will discuss four concerns with Allen's views:

1. Allen argues that Hume's objections to the teleological (design) argument for God's existence and Darwin's theory of evolution by natural selection combine to undermine the reasonableness of any inference from present-day life forms to the existence of God. He contends, however, that

though a biological explanation of these forms is purely impersonal, the possibility that a personal God intended nature's order is not excluded by it. Moreover, in a discussion of "anthropic principles" (statements of connections between the gross structure of the universe and the conditions necessary for human life to arise), Allen explains that developments in recent cosmology indicate that the necessary conditions for life to arise and for human life to evolve are quite specific. He cautions against inferring God's existence from this and instead emphasizes that it poses the question "Why do we have this universe rather than another possible one?" (p. 62). Such questions, he suggests, "point to the possibility of God" (p. 63).

An important mediating alternative, which Allen fails to address, is the argument that God's existence provides a better explanation of nature's order (including the process of evolution by natural selection) than God's nonexistence. Though faith may need to supplement such reasoning for full conviction, this style of argument by inference would provide more scope for philosophy and science in supporting faith than Allen allows. Allen's case for the primacy of faith over reason would be strengthened if he could show that this alternative use of reason cannot succeed.

2. Allen also holds that the cosmological argument fails to show that God exists, since it rests on the principle of sufficient reason (that the existence of whatever is must have an explanation), which is questionable: "Uneasiness over the power of reason is so extensive that the principle of sufficient reason is generally not endorsed by philosophers outside Roman Catholic circles" (p. 77). This dismissal is too quick. Is this "uneasiness over the power of reason" warranted? It is not enough to say that "we have learned from our experience in the sciences that nature sometimes surprises our expectations and shatters our previous views of its laws" (p. 76). Of what relevance is the extensiveness of this unease? Might not Roman Catholic philosophers and others endorsing the principle be justified in doing so in spite of their minority status? Perhaps, as Mavrodes argues in *Belief in God* (Washington, D.C.: University Press of America, 1970), proofs are "person-relative," convincing to some but not to others. Allen needs to address these questions before abandoning the cosmological argument.

3. According to Allen, "Even though faith is not produced by reason, our faith is reasonable because Christian claims illumine the mind on matters that otherwise baffle us" (p. 143). "To have faith is to receive illumination about the universe" (e.g., that "it is not the highest or the best reality"), but our questions "are not answered by our science . . . [and] they are not determinable philosophically" (p. 144). This faith comes about instead by means of exposing "oneself to the book of Scripture and to the Christian community" (p. 214). But can faith not grounded in science and philosophy be reasonable? This depends on whether or not it conforms to correct principles of epistemic rationality. Allen has little to say about such principles; indeed, he says that "considerably more needs to be said to exhibit the reasonableness of this route to faith" (p. 213). He has made a good case for the claim that a rational agent will actively investigate the possibility of God (see pp. 153–54); however, this claim about practical rationality does not imply that what a seeker comes to believe on the basis of contact with Christians and the Bible is rational in an epistemological sense.

4. Finally, Allen misrepresents the current philosophical scene in at least two ways. First, he talks about "the recent displacement of

foundationalism" (p. 152), stating in a footnote that "in the philosophy of religion today, one of the major positions concerning the reasonableness of Christianity is based on a rejection of foundationalism" (p. 229). There are, however, a couple of misconceptions here. While it is widely agreed that classical foundationalism—with its requirement of certain or infallible foundations for knowledge—is false, modest versions of foundationalism allowing weaker foundations are endorsed by many contemporary epistemologists, including most of the contributors to the Plantinga and Wolterstorff volume. Interestingly, Allen could buttress his case for the reasonableness of faith by drawing on their views.

Second, Allen states that "one of the achievements of philosophy in this century has been to show that there are no claims which are true by necessity in any area of inquiry, including science" (p. 134; incidentally, in this context he mistakenly attributes to Descartes the view that a basis for belief is indubitable only if it is necessarily true). In a footnote, he says that "propositions in formal logic and pure mathematics do not constitute counterexamples because they are not propositions about the world" (p. 227). However, he has overlooked scientific essentialism, the view that such propositions as "water is H_2O" are necessarily true and about an essence in the world. This position, championed by Hilary Putnam ("The Meaning of 'Meaning,'" in *Philosophical Papers II: Mind, Language and Reality* [Cambridge: Cambridge Univ. Press, 1975]) and Saul Kripke (*Naming and Necessity* [Cambridge: Harvard Univ. Press, 1980]), remains the subject of lively debate.

In spite of these objections, the book is well worth reading. Allen has drawn on more than twenty years of reflection about the reasonableness of faith and provides scientists, philosophers, historians, and laypeople alike with a wealth of insights worth pondering.

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The Irony of Theology and the Nature of Religious Thought. By DONALD WIEBE. Mc Gill-Queen's Studies in the History of Ideas. Toronto: Univ. of Toronto Press, 1991. 261 pages. $49.95.

The "irony of theology" lies in the fact that it is incompatible with the religious faith it is supposed to be serving. This, according to Donald Wiebe, is the conclusion we must draw once we correctly understand the nature of religious thought.

The book's thesis, at least, is clear: "Theology does not so much complement the Christian faith as undermine it" (p. 174). For Christianity is fundamentally a matter of faith, "mythopoeic thought," and "religious activity," whereas reason demands in every discipline an "inherent autonomy" (p. 209). Theology and religious thought are thus "incompatible," "mutually exclusive" (p. 226). Theology, in fact, "is destructive of the Christian (mythic) Faith" (p. 45). Given the need to choose, Wiebe apparently sides with what he calls, following Lev Shestov, "Christian

existentialism" (p. 217). I presume his entire thesis would follow from this decision alone; isn't it inevitable that an existentialist interpretation of Christianity would mistrust or dismiss theology as an aid to religion?

What are Wiebe's reasons for his strong claim of incompatibility? Three chapters make his case. Chapter 2 ("Mythopoeic and Scientific Thought") is a lengthy defense of the controversial anthropologist Lucien Lévy-Bruhl, whose distinction between the "savage" and the "modern" mind has been seen as the quintessence of the Eurocentric model of cultural anthropology. The rejection of this view has done much to foster the discipline's present emphasis on the deeper understanding gained through immersion in the culture and thought patterns of the group under study. Wiebe, however, argues that Lévy-Bruhl was right, indeed, that the ongoing efforts to repudiate his proposal "ought to raise our suspicions as to the real value of his work" (p. 53). The chapter uses the work of anthropologists to construe mythopoeic and scientific through as being in sharp opposition. In the end, it appears that Wiebe goes even farther than Lévy-Bruhl, who did not assert an "absolute difference" between the savage and the modern mind (p. 58).

The core of the book is composed of two long chapters on ancient Greece (chapters 3 and 4, "Religion and Philosophy in Ancient Greece" and "Theology and the Religion of Ancient Greece"), in which Wiebe examines the transition from a religious to a philosophical tradition. His goal is to show that there arose in Greece for the first time a theology that offered "a rational explanation of religion along with all else in the universe" and that was consequently "at odds not only with traditional religious thought in Greece but with religious thought *per se*" (p. 145). (He makes no mention, however, of the widespread reintroduction of religion into philosophy in the Hellenistic period, a process that had already begun to correct the allegedly secular nature of Athenian philosophy within a few decades of Aristotle's death.) Theology today, Wiebe argues, is characterized by the same fundamentally antireligious nature that he finds in Greek philosophy.

Wiebe has done a remarkable amount of reading in the secondary literature; thus, these chapters offer a good overview of the questions that have preoccupied scholars in the relevant fields. But it may be too much of a good thing; one has the impression Wiebe is using the secondary literature to work his way into fields in which he is not familiar with the primary sources. Indeed, he admits that he has had to rely on "scholarship in fields in which I do not have specialist training" (p. xii). In ninety pages on Greek philosophy, I did not find a single close reading of a text by Plato or Aristotle. If one is to draw an informed judgment on the relation between Greek religion and philosophy, surely there is no substitute for immersion in the classic texts and firsthand knowledge of the authors! The reliance on secondary works reaches surprising extremes: Étienne Gilson's masterful *The Spirit of Medieval Philosophy* (London: Sheed and Ward, 1936)—as deep and balanced an account of the medieval philosophy/theology relationship as one could hope to find—is refuted via a string of quotations from Shestov's *Jerusalem and Athens* (New York: Simon and Schuster, 1966; cited incorrectly in the bibliography) without the use of a single reference from the original source (one can only hope the author has read it!). And this as the climax of the argument in chapter 5 ("Theology and the Christian Religion").

So much for method; what of the book's thesis? Before one can evaluate Wiebe's arguments for the distinction between theology and religious

thought, one must ask whether he is working with a clear distinction in the first place. Unfortunately, the opposition remains muddy. Religion he defines as "those structures of meaning that make sense of human existence in face of an overwhelming and engulfing environment that so clearly reveals the limitations of human beings; of individual and society." Hence, religion is about "stories of transcendence" (p. 33). That this definition is too limited—for instance, it appears to leave no room for the mystical-Spinozistic attitude toward the universe that Einstein found expressed in the equations of physics—may have something to do with Wiebe's later difficulties.

Wiebe links religious thought to what he calls "theology" (with scare quotes) and sets both in opposition to theology (with none). The relevant passage is crucial to the thesis of the book:

> On the one hand there is theology as "God-talk" (henceforth, "theology"), and on the other, theology as "talk about God" (henceforth, theology).

Wiebe continues in the following two footnotes:

> "Theology,"... then, is used to refer to that intellectual response within religion that rationalizes the Faith, so to speak, but only "within limits."... The notion of mystery plays a large role in "theology." ... Essential to the notion is that it would be absurd, indeed illogical, to attempt to analyze mysteries philosophically or to discuss them in ordinary or scientific language. Mystery, therefore, is forever beyond an academic theology, though not, it would appear, beyond "theology." (pp. 15 f.)

The trouble is that this division is unfair to both theology and religious thought. On the one hand, "limits" are stressed in virtually every school of academic theology today. This is true of the "systematic" traditions of Schleiermacher, Troeltsch, Barth, Tillich, Moltmann, and Jüngel (and now even Pannenberg); of postmodern theologies from the death-of-God movement to deconstructive theology; of the theological movements that stress ethics and political transformation; and of virtually all of the theologians involved in the religion/science debate. The only theologians who fit Wiebe's description are dyed-in-the-wool Hegelians, and they are a rare breed indeed.

On the other hand, no clear line can be drawn to demarcate the mysteries of the individual believer's experience from reflective theological categories. Even the mystical tradition that Wiebe cites is replete with examples of a natural transition from existential or mythopoeic to reflective categories; Meister Eckehart and Nicholas of Cusa come immediately to mind. Indeed, Wiebe seems to grant this when he cites Gellner with approval: "The two [generalizing/scientific and traditional/primitive thought] ... can co-exist in the same person, at the same time, and even applied to the same phenomenon" (p. 62 n). Indeed, I have argued (in *Explanation from Physics to Theology* [New Haven: Yale Univ. Press, 1989], chap. 5) that this copresence of "insider" and "outsider" categories represents a dominant form of religious belief today, which I labeled that of the "secular believer." For many of us, religion can and must encompass the categories and thought patterns of science as wen as the stories and experiences of our various traditions. If these two complementary sides—the concern for scientific knowledge and critical thought, and the meaning-bestowing

perspective of religion—are incompatible, then, for many, the Christian religion (at least) will become of only antiquarian interest.

I suggest that Wiebe's dichotomy has a lot to do with his problematic understanding of explanation and science. Explanation inevitably carries a negative tone in this book, implying a mechanistic ideal and the attempt to specify "a structure that will apply generally and impersonally to all like cases" (p. 224). Similarly, theological explanation means treating the gods as objects (p. 161). But certainly a wide variety of attitudes are compatible with the explanatory quest, from dominance and control in, say, reductionistic physics to the desire for deeper understanding in ecology, interpretive anthropology, or psychotherapy. Perhaps this prejudice against explanation has something to do with Wiebe's definition of science as "an intellectual system" (p. 117) in the context of which scientific beliefs function, not "as a social bond amongst the members of the group," but "only 'cognitively' (epistemically)" (p. 214). Science, he claims, reflects "the intention 'to know for the sake of knowing'" (p. 215). But this view of science has been widely rejected in the literature since Thomas Kuhn (as the pages of *Zygon* over the last years amply testify). When science is understood as a thoroughly human endeavor, much of the impetus for Wiebe's dichotomy disappears.

Some may accept as the last word this statement from Shestov, which Wiebe quotes with approval: "God's thunder . . . is the answer to human wisdom, to our logic, to our truths. It breaks to bits not man, but the 'impossibilities' placed by *human reason — which is at the same time human cowardice* — between itself and the Creator" (p. 218; my emphasis). For many, though, religious faith has become more complicated in the modern world. Styles of thought "internal" and "external" to religion, the human intellectual quest and humility before God, are mixed together to the point of indistinguishability in one and the same individual. Sometimes the mixture is immensely creative and productive; sometimes, as Wiebe knows, there are tensions. Rather than declaring the tensions insoluble, let's work to understand and, where possible, to overcome them.

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The Philosopher's Stone: Chaos, Synchronicity, and the Hidden Order of the World. By F. DAVID PEAT. New York: Bantam Books, 1991. 244 pages. $12.50 (paper).

The principal aim of F. David Peat's book *The Philosopher's Stone: Chaos, Synchronicity, and the Hidden Order of the World* is to present a series of "maps and paths . . . designed to lead the reader toward a new science, a new picture of the world, and a new form of perception and living" (p. 35). Whereas the dominant scientific paradigm, grounded in the seminal insights of Descartes and Newton, is informed by what Peat refers to as the principle of "unitarity" (which involves the notions of reduction to quantity and absolute determinism and predictability), the new paradigm

is founded on the notion of irreducible complexity and sees the universe, in the words of the late David Bohm, in terms of "unbroken wholeness in flowing movement."

Chapter 1 traces the emergence of unitary thinking out of Renaissance perspectivalism, Francis Bacon's vision of the "grid" of science, and Descartes's coordinate grid. This development culminates with Newton's revolutionary extension of the Cartesian grid to include the momentum coordinates: "With the help of this new picture, called *phase space*, the entire universe and all its activity could be mapped" (p. 27). Phase-space maps, along with the laws of motion they helped reveal, brought human reflection on nature to a point of unparalleled abstraction in its quest for quantitative and predictive certainty.

Chapter 2 pursues this quest in the search for elementary orders, whether in the form of elementary particles ("from atoms to superstrings") or in the "pyramid of law" (grand unification theories). The logical conclusion of this search is the postulation of a "perfectly symmetrical and featureless" point or singularity as the "ultimate origin" of the cosmos (p. 45).

In chapter 3, Peat reviews the challenges posed for the traditional unitary paradigm by quantum theory. Using the double-slit experiment as an illustration, he introduces the principles of complementarity and uncertainty (relative to the wave/particle and position/momentum variables in the measurement of quantum systems). This is well-traveled ground. What is new and particularly valuable in Peat's presentation is the manner in which he demonstrates how, in light of these principles, "the whole justification for using phase space at the atomic level is thrown out the window" (p. 62). It is at this point that Peat introduces the successor to the phase-space map—namely, Hilbert space—in which points and coordinates are replaced by the more ambiguous and abstract notion of vectors as representations of the states or wave functions of quantum systems. The problem with the conventional Hilbert-space map, however—a problem highlighted in the paradox of Schrödinger's cat—is its inability to account for the "emergence of global forms out of ambiguity and chance" at the quantum level (p. 86).

In chapter 4, Peat explores this problem with regard to the nature of burning candles, crystal formation, the behavior of slime mold and human crowds, and the world of plasmas, superconductors, and superfluids. The general theme is of the emergence of qualities which, though in some sense implicit at the micro level of constituent elements, are manifest, and thus properly actual, only at the macro level of the systems in question. To account for this emergence, Peat suggests that the conception of Hilbert space be revised to accommodate "a rich inner structure of subspaces . . . within subspaces" (p. 88).

In the following chapter, Peat extends his consideration of macroscopic quantum events to the realm of biological systems. Citing the work of Herbert Fröhlich and Fritz-Albert Popp (pp. 100 ff.), Peat points to the phenomenon of "bioradiation" at the cellular and molecular (DNA) levels, which seems to involve coherent, large-scale oscillations of energy. It is proposed that these oscillations act as carriers of information within and between molecules, cells, organisms, and their environments. The "idea that living systems are sustained by highly complex fields of cooperative information," he writes, "may characterize not only living

organisms but entire ecosystems, societies, and indeed the whole planet" (p. 105). Rejecting the traditional notion of the signal as "cargo," however, Peat invokes Bohm's "causal interpretation" (p. 109 f.) of quantum events as paradigmatic of the behavior of such complex fields. The latter are conceived as enfolding "active information" about the whole interactive complex (that is, systems and environment).

It is only in chapter 6 that Peat spells out what he has hinted at in the preceding discussion—namely, that the universe is fundamentally *nonunitary*. By this he means, first of all, that the form or behavior of any observed system cannot be reduced to its hypothetical "elements," nor can it be isolated from its environment or context. Furthermore, given the uncertainty principle at the quantum level, one must renounce the Laplacian dream of being able to account for all physical events or transformations on the basis of prior states of the system in question. By the same token, one must renounce the still dominant physical notion of time as "the measure of unitary transformations" (p. 128). Positively stated, "there is always the possibility for the new . . . and the unexpected to emerge" (p. 134).

In chapter 7, Peat returns to the theme of maps in a consideration of "the chaotic universe" and the nonlinear dynamics required to describe it. This chapter includes a clear introduction to the notion of fractals and chaos theory, using an extension of the phase-space picture presented in earlier chapters.

The final chapter is Peat's vision of a new ethic and a new, harmonious social order that is consistent and continuous with the new paradigm of wholeness and complexity. The main obstacle in this respect is that human societies and the natural world in which they are embedded are "far more complex, subtle, and rapid in [their] responses than the organizations that attempt to control [them]" (p. 208). This is so because of the pervasiveness of the mechanistic or unitary paradigm in all spheres of culture, a paradigm which inculcates rigid, oppositional, and purely instrumental patterns of thought and action. According to Peat, the impetus for change must come through a "creative act of perception" (p. 215) on the part of the individual, which can then "unfold through organizations and governments" (p. 222).

So much, then, for my reading of the essential argument of *The Philosopher's Stone*. To conclude, I will say a few words about the book's major strengths and weaknesses. To begin with the latter, I find the transition (in the central chapter 6, "The Heartbeat of Creation") to the idea of the nonunitary universe to be too abrupt and, as it stands, unconvincing. Instead of building explicitly on those previously discussed aspects of quantum theory and the behavior of cooperative systems that transcend the bounds of the traditional unitary paradigm, Peat simply invites the reader to wonder, "What if the most basic transformations in the universe are nonunitary?" (p. 131). While the reader might expect at this point to be provided with a clear and comprehensive definition of what exactly a nonunitary transformation is, Peat instead jumps from the physical to the metaphysical with the assertion that, in nonunitary transformations, "the universe touches what could be called a ground of unconditioned creativity" (p. 134). The problem with Peat's metaphysics is that this hypothetical "ground" remains completely cut off from the phenomenal universe it is intended to ground. Peat repeatedly describes this ground as "lying" totally

"outside time" (pp. 137, 138). While he admits he is limited to "metaphors and allusions" (p. 135), he seems blind to the spaciometaphorical character of such qualifiers as "outside" and "beyond," which leads him to an unwitting reification of the concept of the ground. Such a ground, though intuitively described as the "creative source" (p. 138) of novelty and change, is in fact confined to a condition (or "place") of perpetual stasis and vacuous immutability.

Peat also leaves other, related questions unanswered. If, for instance, nonunitary transformations involve changes that are "in no way implicit" in anything else (p. 131), what then is the point of the many examples cited throughout the book in which new forms are seen to emerge, as Peat himself says, through "a constant exploration of the implications of the whole environment" (p. 157)? Are not these implications—which Peat elsewhere describes as a "matrix of possibilities" (p. 134)—equivalent to, or at least conditions of, this "unconditioned" ground? If not, then how are they related to it? Peat offers the suggestive images of the beating heart and the flow of the breath as metaphors for nonunitary transformations. In contrast to the static notion of an unconditioned ground, and in keeping with the spirit of the book as a whole, these images point to the idea that novelty and creativity, and being itself, are generated and sustained in the ongoing dialectic of systole and diastole, or implication (enfoldment) and explication (unfoldment), as Bohm might say (though he too is guilty of the tendency to hypostasize the notion of the ground; see Sean Kelly, "Beyond Materialism and Idealism: Reflections on the Work of David Bohm and Edgar Morin," *Idealistic Studies* 22, no. 1 [January 1992]: 28–38).

As to the book's strengths, I already have mentioned the clear presentation of the emergence of the phase-space picture as prototypical of the modern (unitary) paradigm. A little less clear, but still representing an original and stimulating contribution, is Peat's proposal for an extended (structured) Hilbert space to map the problematic gap between quantum and macroscopic levels of reality.

The book's greatest strength, however, is the wealth of fascinating natural facts and related theoretical constructs Peat succeeds in weaving together around the themes of maps and the emerging science of wholeness. What the book may sometimes lack at the level of conceptual rigor is more than compensated for by its broadness of vision and its richness in metaphor and illustrative examples. Finally, Peat is to be commended for his ability to engage the general public in spheres of otherwise specialized intellectual concern from which, were it not for books such as this, it would stand to be increasingly excluded.

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Theism, Atheism, and Big Bang Cosmology. By WILLIAM LANE CRAIG and QUENTIN SMITH. Oxford: Clarendon Press, 1993. vii + 342 pages. $45.95.

This is a rich and provocative book devoted to the theistic implications of contemporary cosmology, in which the authors attempt "to combine a scientifically informed treatment of [recent] cosmological theories with rigorously developed philosophical arguments and counter-arguments with a view toward assessing the bearing of these theories on the question of the existence of God" (p. v).

Such a study is welcome for several reasons. On the one hand, most contemporary cosmologists either do not discuss the theological implications of their work or do so only in writings intended for a general audience. The quality of these popular writings is generally low, since the authors often lack the requisite theological background and philosophical sophistication to develop well-informed, carefully reasoned arguments. (Stephen Hawking's inordinately acclaimed *A Brief History of Time* [New York: Bantam, 1988] is probably the best-known example of this genre.)

On the other hand, theologians and philosophers who do have the necessary background and acumen usually are ignorant of the most recent work in cosmology and so do not seek to bring current physical theory into their writings. The authors of this volume, however, do. Both have been trained as philosophers, but they understand and are responsive to the current state of physical theory. They also are diametrically opposed in outlook: William Lane Craig is a theist, Quentin Smith an atheist. In consequence, they vigorously defend opposite interpretations of the implications of contemporary cosmology, which makes for a good read.

The book draws together in one volume a series of essays, almost all of them previously published, that constitute a dialogue that has gone on between the two authors (who are friendly, if determined, antagonists) for much of the last decade. Craig and Smith have arranged their essays into three debates and have employed the effective dialectical strategy of alternating essays in developing the issues relevant to each of the debates. Some of the essays have been abridged, and introductory material has been added to most of them to enhance continuity within the debates and among them. This is helpful to readers, since there are important threads common to the three debates that should be kept in mind. Also helpful are warnings of upcoming, more technical discussions (e.g., p. 161), an understanding of which is not essential to following the main lines of argument. Attempts by both authors to update their original essays, or to respond to criticisms of them, in annotations or appendices (e.g., pp. 67–76, 129–35), are less successful, since they tend to distract from the main arguments. But overall Craig and Smith succeed in presenting a unified and engaging whole, not the sort of disjointed and confusing patchwork that is frequently the outcome of such collaborative efforts.

Part 1 of the book, "The Theistic Cosmological Argument," centers on Craig's reformulation, in light of recent cosmology, of a traditional argument for the existence of God. Craig claims there is a sound argument for traditional theism; Smith counters that Craig's argument is unsound. Part 2, "The Atheistic Cosmological Argument," has Smith arguing that

any sort of Big Bang cosmology is inconsistent with God's existence and Craig replying that, properly understood, there is no inconsistency. Part 3, "Theism, Atheism, and Hawking's Quantum Cosmology," takes readers beyond classical Big Bang cosmology and into the realm of quantum cosmology, where it is conjectured that the existence of the universe can be explained as an occurrence consonant with ordinary quantum mechanics. Here Craig argues that Hawking's proposal for a quantum beginning to the universe is not a viable alternative to theism, while Smith asserts that Hawking offers a more plausible theory than theism. By the last part of the book, in other words, the locus of argument has shifted (as it has in physical theory itself) from discussion of a classical Big Bang beginning to the universe to discussion of a quantum one. As a result, the book seems mistitled, since parts and 1 and 2 only recount skirmishes leading to the battle fought in Part 3. That battle, of course, is not resolved, but it does leave readers at the cutting edge of the physical debate about theism, which is what the authors intended (p. vii).

Since it would be impossible to comment on every twist and turn in this challenging collection of essays, allow me instead to remark on one of the large issues, permeating the separate debates, that divides Craig and Smith. This is the question of whether the universe has a cause. Smith puts the question this way in the last sentence of the book: "Is the intelligible explanation of the universe causal or acausal?" (p. 337). Craig thinks that it must be both causal and supernatural; Smith, on the other hand, believes it to be natural and acausal.

Craig defends a traditional argument for theism:

1. "Everything that begins to exist has a cause of its existence."
2. "The universe began to exist."
3. "Therefore, the universe has a cause of its existence" (p. 4; also pp. 63, 147, 284).

He then argues that the cause of the universe is a "personal being" who has "freely chosen to create the world" (pp. 66–67, 148 n. 14).

Much of the discussion in part 1 concerns the status of premise 2 of this argument, in particular, whether it is necessary or contingent (pp. 4–57, 78–91, 92–107, 129–135). This issue makes for much interesting reading, but I shall ignore it here, since the authors, arguing from the results of contemporary cosmology, agree that premise 2 is true (pp. vi, 77, 141). My concern, instead, is with premise 1 and with the conclusion of the argument. Craig is not particularly concerned to defend (1), which he thinks is based, ultimately, on a "metaphysical intuition" (p. 147) that no reasonable and intellectually honest person can deny (pp. 57–59, 273). One can perhaps imagine a spontaneous, uncaused appearance of something from nothing, but this does not imply that such an appearance is (meta)physically possible (pp. 59–60, 275). Since (1) is not an analytic statement, denial of it, Craig thinks, does not involve a contradiction, a logical absurdity; but he claims that it is, nevertheless, "metaphysically absurd" (pp. 60, 274). At the same time, he offers arguments for (1), which both authors refer to throughout the book as the "causal proposition" or "causal principle."

Smith rejects Craig's claim that the "causal principle" is sanctioned by "metaphysical intuition," since, he says, "I can conceive of something beginning to exist without a cause. A case in point is the universe" (182).

And "I find it quite easy to conceive of the universe beginning to exist without any cause" (pp. 182–83). He also rejects Craig's arguments in defense of premise 1 (cf. 60–63, 143–60 with 120–25, 178–91). Instead, Smith argues that (1) is false—that "the beginning of the universe is not caused by God or anything else" (p. 77; also, p. 129) and that most quantum events are uncaused. He argues as follows:

1′. Individual events or states are caused only if they are (in principle) precisely predictable.
2′. Individual quantum events or states are not (in general) precisely predictable.
3′. Therefore, individual quantum events or states are (in general) uncaused (pp. 121–25).

Since (3′) implies

4′. There are uncaused beginnings of existence within the universe,

he then argues that

5′. the beginning of the existence of the universe is itself uncaused (pp. 123, 125–28).

Smith offers a proposal as to how this could happen in the last essay of the volume, which discusses his interpretation of a cosmological model first put forward by Hawking and James Hartle (see J. Hartle and S.W. Hawking, "Wavefunction of the Universe," *Physical Review* D28 [1983]: 2960–75). Properly construed, Smith thinks that this model, and its subsequent development, imply the following: first, the universe began quantum-mechanically from *literally* nothing (pp. 301–2, 313); second, the Hawking wave function for the universe, a cosmological variant of the Schrödinger wave equation in ordinary quantum mechanics, gives an amplitude (and, when squared, a probability) that a universe with an initial radius equal to the Planck radius (i.e., 10^{-33} cm) will emerge from literally nothing (p. 311); third, the universe really did begin in such a state (p. 320); fourth, this first state of the universe was also "the first state of a general relativistic [ordinary] spacetime" (p. 313); and, fifth, this first state of the universe was uncaused (pp. 321, 336). Taken together, Smith's interpretation of the Hawking model amounts to the claim that the universe "emerged," uncaused, from literally nothing in a classical state; more generally accepted physical theory is then able to explain its subsequent evolution.

In short, Smith develops and defends a naturalistic cosmogenic hypothesis that he thinks is "explanatorily superior" to either a standard Big Bang beginning (p. 128) or the theistic explanation defended by Craig (pp. 196–97, 216–17, 303–4). I have had to truncate his sophisticated but, it seems to me, misguided argument for this position. (For more detailed criticism, see my "Much Ado about Nothing: A Critique of Quantum Cosmogenesis," forthcoming in *Perspectives on Science*, and my "Emerging from Imaginary Time," forthcoming in *Synthèse*.)

I also must truncate Craig's replies, which appear to me more compelling. (I will not, for instance, comment on the Hawking model, of which Craig gives a fine assessment in essay 11. One also may wish to read my "Hawking on God and Creation" (*Zygon: Journal of Religion and Science* 28, no. 4 [December 1993]: 485–506). Craig rejects Smith's claim that "the

universe . . . simply sprang into being out of nothing without a cause" (p. 231), and he again appeals to metaphysical intuition. "The principle that something cannot come [uncaused] out of absolutely nothing," he says, "strikes me as a sort of metaphysical first principle, one of the most obvious truths we intuit when we reflect philosophically" (p. 273). A "mental picture of the universe arising uncaused out of absolutely nothing" is only a product of imagination and not really conceivable, since such an occurrence is a "metaphysical absurdity" (pp. 275–76).

Appeals to metaphysical intuition are usually suspect, but Craig's is not. To begin with, (1′)–(3′) assume, gratuitously, that precise predictability is a necessary condition of causality. But there are good reasons to reject this entrenched assumption, since it would force one to conclude that most events in classical physics also are uncaused (pp. 146–47). Second, the argument rests on a narrowly epistemic conception of causality (pp. 142 n. 4, 145–46). If one views causation ontologically, which is Craig's approach, then the proper inferences are these: Imprecise predictability does imply (epistemological) uncertainty, but this uncertainty does not imply (ontological) indefiniteness, and such indefiniteness (were it real) would not imply acausality. Third, there is a powerful recent line of argument that requires, as a necessary condition of genuine physical explanation, "an adequate description of the underlying causes" of the explanandum (Richard W. Miller, *Fact and Method* [Princeton: Princeton Univ. Press, 1987], 62). As applied to ordinary quantum phenomena, this amounts to the demand that a physical theory purporting to explain them must either describe their cause(s) or forgo its claim to putative explanation (Miller, *ibid.*, 61–64, 70–72, chap. 11). As applied to the universe, the implication is that if one wishes to *explain* its origin, as Smith would like to do (pp. 128, 304, 336), and not concede that it just happened, one will have to interpret the quantum theory causally, which is not usual and which Smith, in any case, is loath to do. But, fourth, as Craig points out, ordinary quantum events all have physically necessary causal conditions, even if not physically determining sufficient ones (pp. 146–47, 286). This is because, fifth, ordinary quantum events do not ever appear out of nothing: they all occur in an already existing spacetime with a rich structure that physically permits their emergence (cf. pp. 66–67, 128–29, 146–48 with 135–36, 202–4).

To support his own position, Smith cites the physicist Paul Davies (pp. 199, 235), who claims that "the world of quantum physics routinely produces something from nothing" (Davies, *God and the New Physics* [New York: Simon and Schuster, 1983], 216). The proper reply comes from Craig, who notes, simply and correctly, that "the world of quantum physics never produces something from nothing" (William Lane Craig, "God, Creation and Mr. Davies," *British Journal for the Philosophy of Science* 37: 163–75, 167). Finally, and in consequence, the inference from (4′) to (5′) fails. Even if quantum events are uncaused, which I doubt, there is no physical basis in ordinary quantum theory for the claim that the universe itself is uncaused, much less for the claim that it sprang into being uncaused from literally nothing.

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Galileo: For Copernicanism and for the Church. By ANNIBALE FANTOLI. Translated by George V. Coyne, S.J. Rome: Vatican Observatory Press; Notre Dame: Univ. of Notre Dame Press, 1994. xiv + 540 pages. $21.95.

The flood of publications on Galileo—four books in English in the last two years alone—shows no sign of abating. Annibale Fantoli's massive work, many years in the making, traces Galileo's gradual involvement in the Copernican debate, the reactions of the Church authorities in Rome to what they perceived as a challenge to both the inerrancy of the Bible and their own prerogatives in regard to scriptural interpretation, the publication of the *Dialogue on Two Chief World Systems* in 1632, the trial of Galileo in 1633, and the subsequent foot-dragging in Rome, for more than two centuries, as the authorities there faced the consequences of the ill-advised decision in 1616 to outlaw the Copernican doctrine of the earth's motion. The most valuable feature of Fantoli's work may be the footnotes—some 640 of them, several more than two pages long—which occupy 170 pages of the book. The author is thoroughly conversant with the abundant contemporary documentation and displays admirable sensitivity both to what is there and to what is missing. All in all, this may be the fullest treatment yet available in English of the so-called "Galileo affair." The writer's stilted style does not make for easy reading, but the price is a small one to pay for the wealth of detail provided.

If the book has a bias (it would be fairer, perhaps, to say a preoccupation), it is toward the at least partial exoneration of some leading members of the Jesuit order (Bellarmine, Scheiner, Grassi, Grienberger) from major responsibility for what happened. Galileo himself blamed the Jesuits for the catastrophic outcome of the publication of the *Dialogue,* and a multitude of later critics, most notably de Santillana, in probably the most widely read modern version of the story, have followed him in that regard. Fantoli examines the evidence and argues, to my mind convincingly, that it is not nearly as strong as often has been supposed. There can be no doubt about the importance of the role played by Bellarmine, the leading Roman theologian, in the condemnation of Copernican ideas in 1616 (see esp. pp. 167, 177). No doubt either about the hostility that Galileo had engendered among some of the leading Jesuit natural philosophers; and among his contemporaries these were, unfortunately for him, those most competent to judge the merits of the Copernican world system. But Fantoli notes the many other forces at work, both in 1616 and in 1633. In particular, he argues that Galileo could have been led to blame Jesuit enemies for his misfortunes in part because he could not believe that his former friend, Pope Urban VIII, could have turned so completely against him unless the machinations of others had distorted the facts of the case in his eyes. We know from the documents (as Galileo did not), particularly from the diplomatic correspondence between Rome and Florence, just how personally Urban took the publication of the *Dialogue* and just how grave an offense "against religion" he considered it to be. Fantoli is right, I think, to suggest (p. 430) that even if Galileo's Jesuit adversaries had not been directly involved in the Roman debate, Urban would still have reacted strongly to what he would have perceived as Galileo's betrayal of the understanding under which permission was given to proceed with the *Dialogue.*

On occasion, Fantoli allows himself to speculate rather freely as to what went on behind the scenes, notably during the drawn-out procedures leading up to the trial in 1633. On the whole, however, he stays close to the documents on which his account is based. On several matters of interpretation I disagree with his readings. Two are of considerable importance. The first concerns the principles of scriptural interpretation laid down by Galileo in his *Letter to the Grand Duchess Christina* in 1615, dealing with cases of apparent conflict between the literal reading of Scripture and findings of natural science. Fantoli claims that the principles Galileo proposed were coherent and "in agreement with the best theological tradition" (pp. 187, 217). This, to my mind, is not the case, though to argue the point in detail would lead me outside the confines of a book review.

Galileo proposed two rather different approaches to such instances of apparent conflict. One was to suppose, with Augustine, that the literal interpretation of Scripture should be maintained except where the claim from natural science could be conclusively demonstrated. The other was to say that in matters of natural science the Scripture had no particular authority ("The intention of the Holy Spirit is to teach us how to go to heaven, not how the heavens go"). These two hermeneutic principles are not consistent with one another: they would, for example, have very different implications for the project of the *Dialogue*, the first requiring a conclusive demonstration of the Copernican claim before the literal reading of Scripture excluding the earth's motion could be set aside, the second allowing the astronomer full authority in the matter from the beginning. Furthermore, the second of these approaches was by no means traditional. Although one can find evidence in the work of earlier theologians (such as Aquinas and Calvin) of the view that the biblical writers accommodated themselves to the manner of expression of their day, no major theologian of that or any earlier time had, so far as I know, expressed the view that the Bible was not intended to carry any authority in its descriptions of nature.

My second disagreement is with Fantoli's final assessment of the trial of 1633. He claims that although on balance it was conducted in a fair manner, the verdict arrived at exhibited an "excess of doctrinal power," by that meaning that the grounds given for the condemnation were insufficient to warrant the guilty verdict arrived at. Specifically, the claim that Galileo had made himself "vehemently suspect of heresy" was not justified, he asserts, because the decree of 1616 banning Copernicus's work, the only formal declaration the Church had made up to that point in regard to Copernicanism, had not mentioned heresy, but only said that the condemned view was "contrary to Holy Scripture" (p. 426). "How in the world," Fantoli asks, could the charge of suspicion of heresy be sustained against Galileo in these circumstances? Quite easily, I would say. To call into question a belief supposedly sanctioned by the authority of the Bible was sufficient of itself to warrant such a suspicion. There did not need to be a prior formal declaration that the belief in question was to be held *de fide*.

Fantoli concludes that the cardinal judges of the Holy Office in 1633 had no right to force an abjuration on Galileo since the question of heresy was not directly involved. On the contrary, I would argue that, in this respect at least, the judges were technically within their rights. One may deplore this action on their part from our vantage point. But the wording of the

trial sentence makes their basic reasoning clear: the *Dialogue* presents the Copernican view as probable, "a very serious error, since there is no way an opinion declared and defined to be contrary to Holy Scripture may be probable." The primary fault lay with the earlier decree of the Congregation of the Index that declared Copernicanism to be contrary to Holy Scripture. The members of the Holy Office in 1616 who assented to this decree, not their successors in 1633, were the ones ultimately responsible. The judges in 1633 were doing no more than enforcing the earlier decision, though they could easily enough have found grounds (and the three cardinals who did not sign the trial sentence perhaps did find grounds) for withholding judgment. If Urban had not shown himself so unrelenting in his anger with his erstwhile friend, if the political situation in which Urban found himself at the time had not been so dire—historians have imagined many "ifs"—things might have turned out very differently for Galileo. But the 1616 decree would even then have remained to cause trouble for others.

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