Reviews

The Evolution of Altruism and the Ordering of Love. By STEPHEN J. POPE. Washington, D.C.: Georgetown Univ. Press, 1994. xv + 160 pages. $40.00; $19.95 (paper).

Near the beginning of this book, Stephen Pope observes that "the last fifteen years have witnessed an explosion of scientific works on human nature." Yet, he goes on to observe that "no Christian theologian, Catholic or Protestant, has registered these inquiries nor attempted to examine them for their relevance to something so central to Christianity as the love of one's neighbor." Furthermore, he notes, it is "perhaps even more puzzling that most Catholic ethicists" have ignored the relevance of these studies to an understanding of charity, since "the Catholic tradition has insisted powerfully that grace does not repudiate nature but brings it to its completion" (p. xii).

Pope's point is well taken. There has been very little theological reflection on the rapidly expanding discipline of sociobiology, or evolutionary psychology, to use the term that is now preferred for the study of human behavior seen in the light of its evolutionary origins. Furthermore, this neglect is puzzling, particularly for those theologians who work within traditions that have historically been open to natural law forms of ethics. On closer examination, we can see why Christian ethicists, Catholic as well as Protestant, have been hesitant to incorporate the insights of evolutionary psychology, but this reluctance is regrettable nonetheless.

In this book, Pope argues that "the natural gradations of altruism can be positively incorporated into a Catholic understanding of the 'ordering of love'" (p. xiii). In order to make his case, he ranges widely, incorporating into his argument a critique of twentieth-century Catholic reflections on natural law, reflections on Thomas Aquinas's very different attitude toward the moral significance of natural inclinations, and a discussion of contemporary research into the evolutionary origins of human behavior. This bare summary may suggest that this is an uncomfortably crowded book. To the contrary, Pope has written an admirably lucid study, which accomplishes exactly what he sets out to do; that is, he shows the relevance of "natural gradations of altruism" to a Christian and, more specifically, a Catholic account of love as a moral norm.

Nor would it be correct to assume that this book will be of interest to Catholics only. As Pope correctly observes, "The ordering of love is in some ways the fundamental moral problem of Christian ethics," since so many of the problems that we face require us to have "some working distinctions between proper and improper ways of ordering moral priorities and organizing beneficence" (p. 157).

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For this reason, Pope's careful analysis of the possible interconnections between natural and moral forms of ordering love will be of interest to all Christian ethicists and to many moral philosophers as well. Moreover, Pope offers a paradigm for reflecting on scientific data from a theological perspective; as such, his work deserves attention from all theologians who share his sense of the relevance of science to theology, including those whose interests and commitments are very different from his.

Pope is able successfully to incorporate a wide variety of considerations because his work is unified by a basic question: "If altruism is naturally channelled in certain directions more than others, what significance does this have for the meaning and application of the command to love the neighbor?" (p. xii). In order to see the force of this question, it is necessary to recall that in this century, a number of Protestant ethicists, and a few Catholics, have argued that the preferences that we show to family and friends are at the very least morally or religiously questionable. Most Catholic moral theologians, unlike many of their Protestant counterparts, do not consider such preferential relationships to be morally or theologically problematic. Yet because twentieth-century theologians have largely rejected the classical Catholic account of the natural law in terms of which such relationships were affirmed, they are left without a basis on which they could be justified.

How did this situation come about? And how might we arrive at a more satisfactory account of the natural and moral gradations of love? In order to answer these questions, Pope begins by examining twentieth-century Catholic treatments of love, or charity, focusing on the discussions in personalism and liberation theology. In spite of the differences between these two approaches, he notes, they have a great deal in common, including an emphasis on the love of neighbor as the paradigmatic act of charity and a tendency to see Christian love in terms of affection and mutuality rather than as fundamentally an act of will. Without at all denying the value of these approaches, he argues that each sets up an unnecessarily sharp dichotomy between human personality, on the one hand, and human nature and the wider world, on the other. As a result, they ignore natural constraints on human love and fail to offer any convincing rationale for the traditional ordering of love.

In the next three chapters, Pope sets forth what he sees as the most important starting points for formulating a more adequate account of Christian love. The first of these is provided by Aquinas's account of the ordering of love in charity, and the second is provided by contemporary research into the evolutionary origins of human behavior. This may seem like an unlikely combination, but as Pope observes, it is consonant with Aquinas's own attitude toward scientific accounts of human nature. Because he held that grace perfects but does not destroy nature, Aquinas drew on the best science available to him in constructing his account of charity; similarly, we should take the most recent work on the origins of human behavior into account in our own treatment of Christian love. Accordingly, after setting forth Aquinas's own account of the ordering of love and evaluating it in light of the findings of evolutionary psychology, Pope turns in the fourth chapter to a sympathetic yet critical assessment of those findings themselves.

Finally, in his fifth chapter and conclusion, Pope sets forth his own views on the implications of evolutionary psychology for an account of Christian love. These conclusions are professedly tentative and are offered as a starting point for further research, but they are nonetheless illuminating and generally persuasive. Pope does not advocate the view that whatever is naturally given is *ipso facto* normative, but he insists that we must not go to the opposite extreme of ignoring natural givens or denying that these, too, are God-given aspects of our existence. Hence, he emphasizes the importance of acknowledging natural constraints on human love and altruism in constructing any account of Christian love. At the same time, he also notes that the biological and prerational components of our nature can be transcended through rationality to some degree if not entirely.

This is an admirable and important book that should serve as a starting point for future work on the theological significance of evolutionary psychology. Pope's claims are lucid, carefully circumscribed, and persuasively argued. His presentation of the findings of evolutionary psychology (a term, by the way, which he himself does not use) have inevitably become dated, but they still provide a useful introduction to the field. It is interesting to see the degree to which Pope has anticipated the arguments of Frans de Waal, Matt Ridley, and others who claim that altruism is as much a natural part of us as aggression and self-preservation. In addition, he is a careful and trustworthy exponent of Aquinas.

My only major reservation about Pope's argument concerns the way in which he brings together Aquinas and contemporary research. Pope claims that "certain features of evolutionary theory can act as functional equivalences to aspects of Thomas's account of the order of love" (p. 77). However, as he goes on to explain, when ethologists speak of functional equivalences, they are referring to the ways in which two dissimilar entities (for example, an elephant's trunk and a human hand) perform similar functions. It would seem, therefore, that the functional equivalent of contemporary evolutionary psychology would be the scientific and metaphysical theories of human nature on which Aquinas draws rather than aspects of his developed account of charity. Pope's subsequent discussion of Aquinas's theory seen in the light of recent research into the origins of human behavior appears to me to be a critical retrieval of Aquinas's account in which his portrayal of the ordering of love is corrected but also finally vindicated. Since I agree that Aquinas has gotten it right on the question of the ordering of love, at least with respect to the essentials of his account, I have no problem with this line of analysis. But I found myself wishing that Pope had been more explicit about the aims of his analysis.

However, this reservation does not detract from my admiration of this fine book. It deserves to be widely read and discussed by all those who share Pope's interests in Christian love as a moral norm or in the recovery of a substantive, morally significant, and theologically interesting account of human nature.

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Science and Theology: Questions at the Interface. Edited by MURRAY RAE, HILARY REGAN, and JOHN STENHOUSE. Grand Rapids, Mich.: Eerdmans, 1994. viii + 260 pages. $29.99 (paper).

The papers collected in this volume were originally presented as part of a 1993 symposium on the relation between theology and science that was held in Dunedin, New Zealand. The symposium brought together a number of leading scholars in the science and religion dialogue whose thoughtful essays and reasoned responses provide the content of the book. The result is a fine collection that includes original work by several well-known authors in the theology-science dialogue.

The book is composed of six separate papers, each coupled with responses by two other panelists. In some cases, it would have been very interesting to have a return response by the author; but alas, this was not done. Stephen May does provide, however, an excellent and unusually thorough introduction not only summarizing the papers of the panelists but also giving a fine thumbnail sketch of some of the major themes at stake as well as of the *status quo* of the theology-science dialogue. Two of the articles deal with science and natural theology, two with scientific and theological methodology, and two with the implications of science for theology. Generally speaking, the papers work in the abstract, only occasionally discussing specific concerns (religious experience, the anthropic principle) as illuminating examples.

The first article, "Is There a Role for Natural Theology Today?" is by Owen Gingerich, who takes the rather modest position that natural theology does indeed have a place but only within the context of previously held beliefs. Many of the considerations that Gingerich deals with are variations on the anthropic principle: the chances of the fundamental laws of the universe being conducive to the emergence of life, let alone intelligent life, are so remote that they point to a designer. While the evidence of design in nature is sufficiently ambiguous as to be unable to persuade the skeptic or atheist, it is enough to reinforce the belief system of the theist.

In "Arguments for the Existence of God from Nature and Science," Norma Emerton, in contrast to Gingerich, argues that the attempts to prove God's existence are fraught with danger, tending historically to lead either to the Scylla of deism or the Charybdis of pantheism. After briefly discussing the premodern background of the arguments for God's existence (primarily the design argument), Emerton attempts to sketch the impact of science on these arguments in the Enlightenment and, subsequently, in the wake of Darwin. While Emerton's thesis is promising, the brief space in which she presents it allows for a less than nuanced approach. Newton, for instant, is labeled as a deist without explanation, although most scholarship does not see him quite so narrowly.

The third essay, "What Has Theology to Learn from Scientific Methodology?" is by Nancey Murphy and, together with the strongly dissenting responses by Grant Gillett and John Puddefoot, represents the most interesting exchange in the book. This article is continuation and in some ways an expansion of her ongoing research effort to portray theology as a (possible) science. The first half is a summation of her well-known endorsement of the scientific methodology of

Imre Lakatos and its applicability to theology. The second part deals with the question of what counts as data in theology. If science speaks in terms of data and theory, is it not appropriate for theology to do the same? Murphy puts forth Scripture and religious experience as candidates for theological data. Each of these data sets in turn relies on a theory of instrumentation. For Scripture, this theory of instrumentation is a specific hermeneutics (which constitutes part of the research program). For religious experience, it is the discernment of the religious community. As usual, Murphy's thesis is provocative, interesting, and problematic, all at the same time. Her discussion of religious experience, which is given greater attention, is much more successful than that on Scripture. To regard Scripture as an unproblematic datum without further elaboration simply ignores the difficulties raised by historical criticism (among other approaches) that have beset biblical studies and biblical theology over the past two centuries.

John Puddefoot contributes the next essay, "The Relationship of Natural Order to Divine Truth and Will." In some ways, this paper is a continuation of the response to Murphy and emphasizes the interpretive ambiguousness of the natural world. Nature does not provide an interpretive key to itself, clearly implying neither design nor chaos. But if God is of a certain kind of character, then appropriate constraints must be found in the world. If they are not found, then we are interpreting the world incorrectly. Fortunately, claims Puddefoot, the "new physics," with its apparent abandonment of mechanism, provides one touchstone for biblical theology and a more interpersonal, interconnected world. This essay represents the most "Continental" approach in the collection, but it is beset by some problems. As the respondent John Honner points out, Puddefoot seems to want to have it both ways—he denies any connection between science and theology but makes exceptions when the sciences cast a favorable light on his own theories.

Carver T. Yu's "The Principle of Relativity as a Conceptual Tool in Theology" is largely concerned with the lessons from science on the issues of objectivity and relativism. The first part is concerned with Einstein's theory of relativity and how it has sometimes been used to imply conceptual relativism. While Yu's point is obvious, it is nevertheless useful to have the issue put into print along with some documentation of the errors. The second half of the paper then considers which doctrines may be considered invariant in Christianity (God's transcendence, the incarnation) and which may be considered culturally relative (the Trinity). While Yu's paper is interesting, it could stand to delve into the issue in greater depth. As the responses by Lloyd Geering and Norma Emerton point out, Yu underestimates the current arguments for relativism, nor does he recognize the other (more prevalent) arguments drawn from the philosophy of science as well as from history and cross-cultural philosophy.

The final essay, "Theological Notions of Creation and Divine Causality," is by John Polkinghorne. Much of this material is familiar from his other writings, his point here being to emphasize how the mathematical intelligibility of the universe and the anthropic principle make theism a likely and rational response. When discussing the improbabilities of the development of physical laws that happen to be just consonant with the emergence of life, Polkinghorne likens this situation to that of a man before a firing squad where all the expert marksmen

miss, leaving him alive. One could say, "So what?" or one could look for a deeper, underlying cause: the marksmen are on his side. Along with the firing squad analogy, there are a couple of other choice morsels that make the article worth reading. Otherwise, much of this ground has been covered previously.

Of the responses, several are of particular interest. The responses to Gingerich's analysis of the role of natural theology, while polite, have interesting material in their own right. Stephen May largely agrees with Gingerich's position and, in his own way, expands upon it. May contrasts a Christian interpretation of science that places it in a meaningful context with non-Christian interpretations that emphasize the smallness of humanity and the indifference of the universe. Interestingly, May spends quite a bit of time discussing these themes as found in science fiction, from *Star Trek* to the *Hitchhiker's Guide to the Galaxy*. By contrast, Murphy attempts to frame the design argument in terms of a Lakatosian research program. Agreeing with Gingerich, Murphy affirms that a design argument, deductively conceived, cannot and will not convince the skeptic. But evidence of design correlates positively with a theistic research program. In this sense, it can be regarded as a confirming datum.

More interesting, however, are the responses to Murphy's Lakatosian approach to theology by Grant Gillett and John Puddefoot, which indicate the great divides that still exist over theological methodology. While Gillett endorses Murphy's awareness that all knowledge is theory laden, he denies that theological methodology can be compared to scientific methodology. Science deals with objects and objective reality; theology deals with subjects and subjective reality. Theology is opposed to the sciences in that it is hermeneutical in character. God cannot be considered as an object but only as a subject. Therefore, claims Gillett, theology and science cannot be directly compared. Puddefoot, however, goes further. He agrees with Murphy that foundationalism is false but claims that Murphy does not go far enough. One need not look for data, because there are no data to be found. Theology does not need to be empirical, because science is not empirical either. Puddefoot takes a radically antirealist/constructivist approach to all knowledge. Particle accelerators create the particles they are made to find, and they must be found because of the investment of time and imagination that the researchers put in. One wonders, *contra* Puddefoot, why cold fusion and so many other experiments do not work. Physical scientists only dream of the type of explanatory power that Puddefoot seems to envision.

Jack Dodd's response to Polkinghorne is also noteworthy. As a physicist and the only agnostic eavesdropping on the proceedings, Dodd has several pointed criticisms worth pondering. Dodd differentiates between four different notions of God: God the Creator, God of Providence, God the Interceder, and God the Father. Dodd primarily poses two questions. The first is: Why should all these different notions of God be connected? Why are they one and the same God? Dodd's second question is: Which notions of God are scientifically plausible or possible? Of these, Dodd states that only God the Creator has some (possible) utility. Dodd admits with Polkinghorne that there is a baffling intelligibility to the universe and that some may respond to this by a belief in a Creator, although this is an option that Dodd does not choose himself. Dodd's questions, however,

provide a useful challenge to those who continue the theology-science dialogue and provide one of the more insightful responses in the book.

While the papers treat a wide range of issues from an equally wide range of perspectives, a theological conservatism runs through them that will no doubt delight some readers and irk others. With the exception of Dodd, the orthodox Christian paradigm of a Trinitarian God and an incarnational Christology is largely taken for granted. Even so, the subjects treated here are of sufficient interest and many of the authors are of sufficient note that there should be something here to please or stimulate everyone.

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Philosophical Naturalism. Edited by PETER A. FRENCH, T. E. UEHLING JR., and H. K. WETTSTEIN. Midwest Studies in Philosophy, vol. 19. Notre Dame, Ind.: Univ. of Notre Dame Press, 1994. 484 pages. $52.95; $31.00 (paper).

Naturalism: A Critical Appraisal. Edited by STEVEN J. WAGNER and RICHARD WARNER. Notre Dame, Ind.: Univ. of Notre Dame Press, 1993. 342 pages. $36.95; $16.95 (paper).

Philosophical naturalism forms the backdrop for all work in religion-and-science. Unlike some theologians and religious believers, scholars in our field consider religious positions against the backdrop of the widespread scientific assumption that only physical objects and energy (and those empirical beings composed of them) exist. Even more influential than this concern with *metaphysical naturalism* is *methodological naturalism*, the position that scientific research requires one to assume in practice that all explanations of events in the world can be given in natural and physical terms. Naturalism is not the only position that can be defended in the religion/science dialogue, but it is one that every scholar in this field must take seriously as she or he does her or his work. In the following paragraphs I consider some of the concepts, distinctions, arguments, and difficulties found in two recent and important collections of essays on the topic of naturalism.

In the Midwest Studies volume, a rich assembly of naturalisms is represented. The most "constructive," it seems, are those inspired by the work of the philosopher W. V. O. Quine, since they represent a concrete project: the task of "naturalizing," or accounting for in purely naturalist terms, the wide variety of human intellectual fields and facets of human existence. Richard Foley calls these attempts at naturalizing "dominant" in contemporary philosophy: "In philosophy of mind, the dominant project is to show either that intentional attitudes are scientifically respectable or that they can be made so; in philosophy of language it is one of how to naturalize content; and in moral philosophy it is one of how to naturalize moral concepts" (p. 243).

Hilary Kornblith speaks for most of the authors when he writes, quoting R. Wilfrid Sellars, "Science is the measure of all things, of what is, that it is; and of what is not, that it is not" and, "We are all naturalists now. . . . It is . . . a recognition of the impressive implications of the physical and biological sciences. And, not to be outdone, psychology has swelled the chorus" (pp. 44, 50). Kornblith also tries to make the case that a naturalist's methodology or theory of knowledge and her or his metaphysics are inseparable. His challenge is a serious one and admits of no easy answer:

> The task of the naturalistic metaphysician, as I see it, is simply to draw out the metaphysical implications of contemporary science. A metaphysics which goes beyond the commitments of science is simply unsupported by the best available evidence. A metaphysics which does not make commitments as rich as those of our best current scientific theories asks us to narrow the scope of our ontology in ways which will not withstand scrutiny. For the naturalist, there simply is no extrascientific route to metaphysical understanding. (p. 40)

We have good reason, he adds, to think that terms in successful scientific theories refer to items in the world; conversely, we have no good reason to think that terms not part of scientific theories refer to anything actual at all.

The seriousness of Kornblith's contention is strengthened by the fact that he does not limit the "sciences" covered by this rule to natural sciences such as physics but includes psychology and the human sciences as well. The view, then, is not that "higher order" sciences are reducible to "more fundamental" sciences such as physics (as in earlier versions of naturalism) but rather that "everything is wholly physically constituted" and thus that things like mind and mental states are entirely constituted of physical stuff. One can't help but wonder, however, whether Kornblith's naturalism of emergent levels doesn't open the door to religious concerns and specifically to a kind of "religious naturalism." After all, in opposition to older versions of naturalism, he is a strict antireductionist, insisting on real causal relations and natural kinds in higher order disciplines and opposed to Humean skepticism about causality. Why could this view not allow, then, for the introduction of "natural kinds" at an *even higher level* than psychology, perhaps in the way that Pierre Teilhard de Chardin moves from the psychological level to the realm of spirit?

Probably the largest set of articles in this book deals with the question of "naturalized epistemology," that major program in contemporary philosophy that seeks to rethink the theory of knowledge not as a normative discipline concerning what one "ought to believe" or "is justified in believing" but rather as a subset of psychology that describes how humans *actually* form judgments and assess the relations of beliefs to evidence. Although naturalized epistemology may well be the dominant movement in the theory of knowledge today, it is by no means above controversy. Mark Kaplan, for example, raises some searching questions about the consistency of this program. Noting that epistemological naturalists generally offer arguments in defense of their program, he says, "It is hard to see what we can do except evaluate these arguments by the light of the very sorts of epistemic intuitions which the naturalists are so eager to disparage" (p. 360).

A large number of the essays are concerned in particular with the arguments for a naturalistic understanding of mind or consciousness. Various authors struggle with the question of whether beliefs, contentions, emotions, and ethical attitudes can be accounted for in wholly naturalist terms. Searle is a good spokesperson for the naturalist view: "Consciousness and other forms of mental phenomena are biological processes occurring in human and certain animal brains" (p. 214). He claims that a naturalist solution to the famous mind-body problem is easy: "Mental phenomena are caused by lower-level neuronal processes in human and animal brains and are themselves higher-level or macro features of those brains" (p. 214). It follows from this claim that dualism must be false (there is no such thing as soul or mind apart from a physical basis); further, there could be no life after death or reincarnation of a "soul" in another body.

The essays in *Philosophical Naturalism* are united in being opposed to the postulation of any supernatural entities, causes, or actions. They are not, however, characterized by an attraction to old-style naturalism, which urged the reduction of all events, causes, and entities to the realm of physics. Patrick Suppes speaks for many when he writes, "In the real world of natural, as opposed to supernatural, phenomena, intention and will are evident and unproblematic. Intentional action is indispensable whether the world is indeterministic or deterministic" (p. 454). The world may well be understandable only by means of explanations that refer to goals, intentions, and beliefs. Nonetheless, for these naturalists, understanding it will not and may not involve the introduction of any entities that cannot be the object of some area of scientific study.

The editors of *Naturalism: A Critical Appraisal* define *naturalism* as "the view that only natural science deserves full and unqualified credence" (p. 1). Naturalists accept the rule that "everything real is at least in principle within the scope of a purely scientific description of the world" (p. 23). In contrast to the work just reviewed, this book treats the "naturalization" program of Quine in a primarily critical fashion. The advantage of Quine, the authors admit, is that his program does not simply dismiss non naturalist philosophical options (mind and body, mental causation, value questions), whereas classical naturalism ruled out non-natural propositions (such as religious claims) as absurd from the outset. Quinean naturalism seeks instead to provide a detailed reinterpretation of all nonphysical predicates in physical terms. Quine has put it perhaps most succinctly: "Physics is the arbiter of what is, that it is; and of what is not, that it is not" (p. 15).

As its title suggests, this volume is primarily critical. The criticisms seem to fall into two major categories: on the one hand, the accusation that the project of naturalization has not been successful and therefore represents a promise without a successful program; on the other, the accusation that naturalism itself is inconsistent, since it argues for reducing all truth claims to scientific conclusions even though *it* is not a scientific conclusion itself. Between the cracks one senses a general discomfort with the naturalist agenda as too narrow insofar as it admits only the scientific perspective and excludes art, philosophy, and questions of meaning as studied by the social sciences—not to mention religion. Three different topics are raised again and again: critiques of naturalist accounts of *justification*, discussions of naturalist treatments of *metaphysical issues*, and

explorations of naturalist approaches to the *mind-body problem*. The authors of the articles in this book do not come at naturalism with a sledgehammer; they do not rant and rave at naturalists from an external perspective such as theism (which is not to say that external critiques are never justified!). Rather, they are looking for internal difficulties with the naturalist project(s) and urge subtle revisions or corrections in popular contemporary versions of naturalism. The arguments are well worth reading in detail, since they provide an excellent snapshot of the climate of philosophical discussion today and the way in which one must go about challenging naturalism if one hopes to be taken seriously in the current intellectual milieu.

A number of the criticisms of naturalism here involve a defense of "folk psychology," the everyday way of speaking about humans as possessing intentions, beliefs, desires, and reasons. Eliminative materialists (e.g., Churchland and Stitch), who would reduce all predicates to the predicates of physics, are willing ultimately to leave folk psychology behind. Hence *anti*-naturalism comes out as the position that "the view of human beings as rational agents is right enough to warrant its persistence, in *some* recognizable form, across all conceptual and scientific evolution" (p. 13). Scholars of religion/science should note these battle lines: the naturalism debate is *not* directly about the opposition between natural explanations and supernatural or religious explanations; it is, in the first place, about how we understand human beings in the world. The value of this volume lies in the specific and careful arguments that these philosophers bring to show that naturalists have so far been unsuccessful in reducing epistemological and ethical concepts, and the mental in general, to a purely naturalistic framework.

One model example is George Bealer's "The Incoherence of Empiricism," which argues in detail that empiricism alone, without the addition of other intuitions that help to justify knowledge claims, is insufficient. Strict empiricism usually means limiting knowledge claims to what can be derived from the natural sciences alone. But, Bealer shows, the natural sciences taken by themselves are not sufficient for grounding talk of justified truth claims: "The problem results from the fact that the simplest formulation of the natural sciences does not contain our standard epistemic terms 'justified,' 'simplest,' and so forth, nor does it contain an apparatus for defining them" (p. 181). Supplementing strict empiricism with nonempirical intuitions also means supplementing the results of the natural science (epistemic naturalism) with other sources of knowledge.

In similar terms, Steven Wagner ("Why Realism Can't Be Naturalized") tries to show that, just as a natural science-based empiricism is not only insufficient for but actually inconsistent with our standard account of epistemic justification, so also naturalism is not only *not* the best basis for realism (the view that takes the terms of language to refer to a really existing external world) but actually inconsistent with it. In addition to an insightful presentation of the problems with physicalism (pp. 213f.) and naturalism (pp. 216ff.), Wagner shows that naturalism, strictly defined, does not have the resources for making sense of claims concerning the reference of language to the world. Consequently, the naturalist cannot consistently be a realist: she or he might have realist intuitions but can neither explain what is meant by them nor defend them within the parameters of her or his own naturalism.

Both of these books contain essays of a high caliber; together, they provide a rich picture of what we mean when we say that naturalism is taken for granted in wide segments of the contemporary intellectual scene. They also illustrate why many of us have maintained that the reasons for espousing naturalism are not really adequate to justify its being taken for granted in this way. Since naturalism is the backdrop for many of the discussions within religion/science—if not for the entire discipline itself!—readers of this journal would do well to acquaint themselves with this discussion.

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God, Creation, and Contemporary Physics. By MARK WILLIAM WORTHING. Minneapolis: Fortress Press, 1996. 267 pages. $20.00 (paper).

Mark William Worthing is a pastor who also teaches at Luther Seminary, Adelaide, Australia. Worthing strongly affirms the value of an interdisciplinary dialogue between theology and modern physics, including cosmology. He concludes his book by emphasizing that it would be disastrous for theology to shrink from participating in such a dialogue, but at the same time he maintains that the dialogue must be mutual.

Worthing begins his book by noting that in physics these days there is a lot of "God talk," but at the same time he asks the key question, What kind of God is being talked about? This question motivates the topics he chooses to address in his book, and Worthing makes his approach to this question very clear in the introduction by stating his purpose for the book in terms of a threefold objective, then giving us his understanding of the enterprise of physics along with what he means when he speaks of God, and finally telling the assumptions behind his study. His threefold objective is

> . . . first, to determine what contemporary physicists (and those in adjacent fields) are saying about God and God's relationship to the space-time world; second, to analyze the validity and significance of this emerging "God-talk" from the perspective of Christian theology, with attention to both the possibilities and pitfalls inherent in the new rapprochement between theology and science; and third, to suggest some necessary presuppositions and a methodological basis for this continuing dialogue with physics. (p. 2)

Worthing sees contemporary physics as a program which "is engaged in the search for a comprehensive theory (or theories) of existence that would explain the functioning, origin, and destiny of the universe" (p. 3). Worthing is interested in what "are the metaphysical/theological conclusions and implications that are, at least ostensibly, rooted in the study of the issues addressed by contemporary physics" (p. 3). He makes it very clear that when he refers to God (in

contrast to the variety of conceptions of God of the physicists who are referred to in this study), he is referring to

> specifically the transcendent, triune God of Christian theism whom the Christian faith confesses to be the God who created and preserves the physical universe, who was involved personally in human history through Jesus Christ, and whose hands hold the final destiny of the universe. (p. 4)

Worthing completes his introduction by stating two assumptions which underlie the study that constitutes the bulk of his book.

> The first is that science can legitimately address questions related, at least indirectly, to the existence and role of God in our world. . . . The other major assumption of this study is that, while theology cannot critique the specifically scientific and technical aspects of physics, it is certainly free to analyze the relevance of the results of physics for theology as well as to critique the validity, consistency, and significance of those conclusions that are clearly metaphysical or theological in nature. (pp. 4–5)

The stage is set for Worthing to attempt to answer the question, What kind of God are these people (the physicists) talking about? Is this the God of Christianity? But first in chapter 1 he gives us a brief but very useful historical summary relevant to the physics-theology dialogue, along with an outline of major developments of twentieth-century physics (relativity and quantum theory) and Big Bang cosmology. Worthing ends chapter 1 with a short section on his typology of contemporary viewpoints regarding the relationship between science and theology.

In chapters 2 through 5, Worthing addresses four important issues of crucial interest to Christian theology, all in terms of the current state of the game in physics—traditional and some contemporary arguments for the existence of God (chap. 2), creation (especially *creatio ex nihilo*) (chap. 3), God's continuing activity in the universe (*creatio continua*), including the question of the problem of evil (chap. 4), and whether and how it is going to end—the eschaton (chap. 5).

Worthing ends the book by summarizing the previous four chapters and asking and answering two questions: What does contemporary physics actually contribute to the theological discussion of God? What is the role of theology in relationship to the enterprise of physics?

A brief assessment of the book: In my opinion, Worthing is completely correct in the basic assumption that underlies his book, namely, that physics and Christian theology must be in dialogue. In addition, I believe that Worthing has identified some crucially important issues in theology for which physics can give helpful input. And finally, his last chapter could serve as a useful framework in which the dialogue could be carried out.

In my opinion, however, the book suffers from two problems, which may be relatively minor or could be rather irritating, depending on the background of the reader or the purpose for which the reader uses the book. The first problem is that although the copyright date is 1996, this is in reality a 1992 book. There are almost no references beyond 1992, although between 1992 and 1996 a significant amount of work was done and published relating to the major issues addressed in chapters 2 through 5. And because so much good work has been

done recently in these areas, the book is in a sense already out of date. As a result, although the discussions in chapters 2 through 5 may serve as a useful introduction to the issues discussed there, they do not represent the latest thought, especially with respect to issues of divine providence and God's interaction in the universe (chap. 4), the topic of the latest two volumes resulting from the collaboration of the Vatican and CTNS (the Center for Theology and the Natural Sciences in Berkeley, California).

My second quibble is that at a number of places in the book where Worthing discusses a topic or concept in terms of physics, he quotes a physicist without giving any interpretive commentary, and sometimes without defining technical terms or even the meaning of symbols in an equation. This is no problem for someone familiar with the physics being discussed, but of course that reader doesn't even need the quotation. My guess is that other readers would know little more in terms of the physics being addressed after reading the quotation than they did before they read the quotation. Instead of using quotations without commentary, it would have been preferable for Worthing simply to discuss the physics concepts in his own words, perhaps in consultation with a physicist if he did not have enough experience related to the topic.

But on balance, the book is well worth reading, for it at least opens the discussion on a number of crucial topics that are relevant to both physics (including cosmology) and Christian theology. I agree that Worthing's first topic, the question of the existence of God (chap. 2), is well worth including in a book such as this. The recognition of the fine-tuning of the universe for the possibility of life on our earth and the recent formulation of the anthropic principles suggest that arguments such as the design argument or other arguments for the existence of God might well be reconsidered or possibly be reformulated in light of these developments in physics.

Chapter 3 on creation is a nice straightforward summary (up to 1992) of the status of scientific thought related to the origin of the universe and the theological doctrine of *creatio ex nihilo*. Worthing concludes that this doctrine is at least tenable in terms of our scientific knowledge. He further suggests that

> The true significance of the *creatio ex nihilo* axiom is not as a theory of origins but rather first and foremost as a statement about God and God's relationship to the physical, contingent universe. The contingency and dependence upon God of each aspect of the physical universe in each moment of its existence is, therefore, the central message of a creation out of nothing. . . . The natural sciences neither determine the content nor set alone the agenda for theological reflection. (pp. 106–7)

In chapter 4 Worthing deals with divine interaction in terms of continuous creation, providence, and the possibility of divine intervention or activity in the physical universe. This is a chapter in which Worthing's presentation could be significantly expanded by reference to the more recent (yet published in 1995 and before) work of the Vatican/CTNS collaboration: *Quantum Cosmology and the Laws of Nature* and *Chaos and Complexity*. In this chapter I also find a number of quotations by physicists in need of further discussion, or perhaps a discussion of the ideas without the use of quotations might be more appropriate. Of course the

question of how the universe is operating now, from the micro (quantum) level to the cosmological regime, is not at all settled in terms of the physics. And from the point of view of theology, it is just as complicated and problematical.

Chapter 5 is a discussion of eschatology, first from the point of view of the attention the physics community is finally giving to the question of the fate of the universe and of life as we know it on earth. Many open questions remain, yet a number of possible physical scenarios present problems for Christian theology. Worthing correctly suggests that theology must not simply wait until more favorable theories arise but must be willing to struggle with the implications of physical pictures of the consummation of the universe.

Worthing concludes in his last chapter that contemporary physics indeed contributes significantly to the theological discussion of God and that theology likewise has a positive role vis-à-vis physics. For example, Worthing maintains that "the theological discussion of creation and eschaton, beginning and end, can no longer take place in isolation from our knowledge of the physical world if, indeed, this were ever truly possible" (pp. 204–5). On the other hand, "a primary task of theology in regard to physics itself is to warn against reducing the totality of reality to what can be seen, measured, explained within the context of specific theories, or otherwise accounted for on the basis of empirical inquiry alone" (p. 210). But Worthing also warns that "If physics and theology are to achieve a meaningful dialogue, that dialogue must be mutual" (p. 206).

In summary, I asked myself, Is this a book that I would want to use in my teaching? I teach a course in theology and science for undergraduates at the University of Redlands, and a course in theology, science, and ministry for Christian ministers in the Doctor of Ministry program at Fuller Theological Seminary. My answer in both cases is yes, I will use this book. But the book cannot stand alone.

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