Postmodernism and the Dialogue between Religion and Science

NATURALISMS AND RELIGION

by Willem B. Drees

Abstract. Such terms as *materialism*, *naturalism*, and near synonyms evoke strong negative reactions among many believers. However, the notion of *naturalism* has various meanings; implications for religion differ for the several varieties of naturalism. In this paper I analyze epistemological and ontological variants of naturalism and explore the perspectives for religion within a nonreductive ontological naturalism.

Keywords: epistemology; limit questions; materialism; naturalism; ontology; reductionism; religious traditions.

Materialism is now the dominant systematic ontology among philosophers and scientists, and there are currently no established alternative ontological views competing with it. As a result, typical theoretical work in philosophy and the sciences is constrained, implicitly or explicitly, by the various conceptions of what materialism entails. Reductive and eliminative versions of materialism now compete with nonreductive species for the best rendition of materialism as a systematic ontology.

—P. K. Moser and J. D. Trout, eds.
Contemporary Materialism: A Reader

One possible agenda for science and theology is to articulate a nonnaturalist (or nonmaterialist) ontology that is compatible with science and

Willem B. Drees, a physicist, theologian, and philosopher, holds the Nicolette Bruining Chair for Philosophy of Nature and Technology from a Liberal Protestant Perspective at the University of Twente, Enschede, the Netherlands. He is also a staff member of the Bezinningscentrum at the Vrije Universiteit, De Boelelaan 1115, 1081 HV Amsterdam, the Netherlands. His e-mail address is WB.Drees@dienst.vu.nl. This paper was presented at the Theology and Science Group of the American Academy of Religion, New Orleans, 26 November 1996.

[*Zygon*, vol. 32, no. 4 (December 1997).]
 ISSN 0591-2385

hospitable to religious convictions. Because I think naturalism is a stronger contender than currently available alternatives (see below, sec. 2), I prefer another agenda, namely, to reflect on the meaning of naturalism (sec. 1) and on the possibilities for religion in the *scientific image* of our world that thus arise (sec. 3). I argue that naturalism need not be identified with atheism. Rather, it can be seen as a reflection of the created integrity of the natural order; the divine can be identified with the prime cause or ground of the web of natural causes. The actual way this created integrity turns out to be, as an evolutionary one, allows us a second way of envisaging religion, namely, as traditions of explicit and implicit wisdom.

1. Science and Naturalism

1.1. CHARACTERISTICS OF SCIENCE. Science studies realities that are to a large extent independent of humans and of human attempts to find out about them. In that sense, I take a *realist* view of science. However, such a realism does not carry us very far in debates on *scientific realism*, which are in my view not debates about the existence of reality out there but rather debates about the quality of our knowledge. Which theories, or which elements in our theories, can we take seriously as depicting the way reality is, and to what extent? What criteria should we apply when we attempt to answer such questions? Scientific explanations and concepts are provisional human constructs organizing the natural world; they are not independent of human intellectual capacities, social interactions, and contingencies of history, although one can speak meaningfully of *The Advancement of Science* (Kitcher 1993).

One major characteristic of the sciences is their wide *scope*; their domain seems to be without obvious boundaries. Terrestrial physics is applicable to heavenly phenomena as well, and chemistry to processes in living beings. The domain of the sciences extends from the smallest objects to the universe at large, from extremely brief phenomena to the stability of rocks, and from heavy objects to massless light. Scientific knowledge also exhibits a significant inner *coherence*. Although it may be strongly violated temporarily, coherence has always reestablished itself as a result of later scientific developments. Coherence has become a criterion that makes us extremely suspicious of purported knowledge that stands in splendid isolation, even if it does not conflict with the rest of our knowledge.

Science enlarges and changes our view of the known world (e.g., McMullin 1994, 81). Scientific theories postulate entities and concepts of a kind not found in the data. They thereby offer us scientific images of the world that differ from our manifest images (Sellars 1963). This is

especially relevant when we consider religion, because religion is often intimately related to manifest images.

Contemporary natural science is stable and provisional. It is stable in the sense that many branches of science seem to be cumulative, building upon knowledge acquired in the last few centuries. For instance, it seems extremely unlikely that physicists and chemists ever will abandon their belief in atoms and in the periodic table. However, science is also provisional, and it is provisional not merely because we may extend our knowledge into new domains but also because we may reach a deeper understanding of domains already known and as a consequence modify our views.

Isn't Reality More "Wild" Than Science Can Express? One objection to the prominence given to science by naturalists is that it applies only to those aspects of reality amenable to scientific study. Is reality not in its wildness "hopelessly beyond science's powers to analyze"? As the novelist John Fowles expressed it in *The Tree*, "Ordinary experience, from waking second to second, is . . . hopelessly beyond science's powers to analyse. It is quintessentially 'wild,' in the sense my father disliked so much: unphilosophical, uncontrollable, incalculable" (1979, 40f). In my opinion, this wildness is a genuine feature of reality, and it should make us modest with respect to the claim that scientific theories can explicate all actual experience. Irreducibility should be part of our understanding of reality. However, this "wildness" is itself intelligible within a naturalist view inspired by the sciences, as I argue in the remainder of this subsection. Thus, the richness of experience does not count against a naturalist view of reality.

How is it intelligible that ordinary experience seems "hopelessly beyond science's powers to analyse"? We tend to use models of reality that are too simplistic, such as metaphors from technology ("letting off steam" and more recent computer metaphors). There is nothing against such metaphors, but wild nature, including human nature, is richer than such technological metaphors can express. Another reason for the wildness of human experience is that we as humans do not (and cannot) monitor our inner states. Furthermore, the causal webs of responding to the environment are the product of our convoluted history, as a species and individually.

We are also limited with respect to detailed explanations of particular events. Chaos theory has made clear what should have been obvious to students of historical evidence: we never have sufficient knowledge of all the details to provide a full account of the course of events. As long as the concept of explanation is not used in an overdemanding way (which would make it hard to find any cases where anything is explained), such limitations do not imply that the development of current life-forms or

the weather is inexplicable in a religiously significant sense; phenomena are explained when underlying causes or mechanisms are discerned (an ontic notion of explanation) and when they are located in a wider theoretical framework (an epistemic notion of explanation; see Salmon 1990). Quantum physics may be interpreted as showing that there are limitations to the determinateness not only of our knowledge but also of reality. However, even then we may consider the outcome of a quantum event to have been explained when it is understood as one of the possible outcomes given the situation.

In addition to the limitations mentioned so far, there is also a limitation of a conceptual kind: sciences describing higher, more complex levels of reality need concepts that are not adequately expressible in the concepts of physics; they cut the pie of reality into intelligible units and processes in different ways. This shows up especially clearly in the relationship between biology on the one hand and physics and chemistry on the other. In physics and chemistry, phenomena are classified primarily in terms of what they do and of their microstructure, whereas in biology, phenomena are classified primarily in terms of their purpose and function.

The history of science may also shed light on the adequacy of scientific images. The first phase of modern physics and chemistry was the study of simple phenomena. Thus, they passed over the complexities of friction in physics and of surface phenomena in chemistry. An enormous amount of abstraction and simplification (compared to the real world) was needed to develop theories with some depth. In this phase, science was clearly inadequate for complex phenomena outside the lab. However, in this century, the scope of science has expanded enormously. Scientists now study complicated processes such as those not in equilibrium and processes in thin layers. Increased computing power and powerful techniques in molecular biology and physics have joined forces. Thus, science is getting better able to study the complexity of the real world.

Although scientists are in many cases able to understand how a particular phenomenon fits into the larger picture, this insight comes at a price; often the actual process is understood to be the consequence of processes that cannot be traced in full detail, either because the phenomenon has a history about which we have insufficient data (e.g., evolutionary histories of species) or because it concerns a system about which we cannot know the actual state of affairs at a single moment (either for apparently ontological reasons, as in quantum physics, or for epistemological reasons, as in chaotic systems such as the weather).

Despite these limitations, or perhaps even because of them, science is now able to face more than the garden where reality is pruned to make it manageable to science; wild reality comes in sight again. It is a

philosophically interesting feature of our reality that this approach is successful, that is, that simplification has opened up a route to understanding complex phenomena. As a consequence of the detour through the study of simpler systems, science now more fully understands wild reality in its variety and at the same time its own limitations in explanatory and predictive power.

1.2. VARIETIES OF NATURALISM. The label *naturalism* is used in various ways. One distinction, introduced by Strawson (1985), is between *soft* and *hard* naturalism. In the soft understanding, naturalism refers to what we ordinarily do and believe as humans, what we say about colors, feelings, and moral judgments. When a painting is considered naturalist, it is in this soft sense. The hard version, according to Strawson, attempts to view human behavior in an objective, detached light as events in nature. This distinction corresponds to the distinction made above between *manifest* and *scientific* images. I am of the opinion that in the light of the successes of science we have to give hard naturalism priority over soft naturalism; science, in many instances on good grounds, *corrects* our (soft) natural understanding of reality.

In his typology of views of the relationship between science and religion, Ian Barbour characterized scientific materialism with "two assertions: (1) the scientific method is the only reliable path to knowledge; (2) matter (or matter and energy) is the fundamental reality in the universe" (Barbour 1990, 4). The first assertion is epistemological, the second one ontological. Clarity is served and problems about scientism are avoided, I think, if we distinguish explicitly between those two assertions. Before explicating an ontological understanding of naturalism, which I consider the relevant one, let me first describe epistemological naturalism.

In the *Encyclopedia of Philosophy* Danto (1967, 448) defines "naturalism" as the view that whatever exists or happens is "susceptible to explanation through methods which, although paradigmatically exemplified in the natural sciences, are continuous from domain to domain of objects and events." Such a naturalism is "a methodological rather than an ontological monism . . . , a monism leaving them [philosophers] free to be dualists, idealists, materialists, atheists, or nonatheists, as the case may be." Such a methodological understanding of naturalism is held to be neutral (and thus, one could say, friendly) toward religion by abstaining from ontological claims. However, I see two major disadvantages to the definition.

a. If "continuity of methods" is given some discriminating sense, it may exclude too many relevant intellectual enterprises. Methodological or epistemological naturalism does not accommodate more metaphorically laden forms of discourse, such as are characteristic of the humanities

and of religious narratives. This is a problem that it shares with an epistemologically reductionist form of ontological naturalism, but an ontological understanding of naturalism need not assume such an epistemological reductionism.

b. If continuity with scientific methods is the main criterion, questions that cannot be answered by these methods will be dismissed as meaningless, whereas if naturalism is understood in ontological terms, there is no ground to dismiss such questions a priori. This is especially relevant when we pose questions regarding the framework of existence and order assumed (rather than explained) by the sciences. The methodological naturalist has to dismiss such questions, whereas an ontological naturalist can be more open-minded with respect to limit questions.

Ontological Varieties of Naturalism. Ontological naturalism comes in varieties (Moser and Trout 1995, 5). *Reductive materialists* take it that regularities in "higher" phenomena such as mental states correlate with regularities at the level of physical processes (type-type identity). *Nonreductive materialists* reject a strict correlation between physical and psychological properties and regularities, even though each actual mental event is physically embodied (token-token identity). Money exists as precious metals, paper, electronic codes, and seashells; it would be neither feasible nor helpful to deal with economic processes in terms of the physical characteristics of money. The taxonomy of a science describing higher-level phenomena need not carve up the world in the same way as physics.

According to *eliminative materialists*, we should eliminate higher-level notions rather than understand how they are embedded in material reality. For instance, Paul Churchland (1981) holds that our folk psychology with notions of desire and belief will fade out of existence once it is replaced by a more adequate neurophysiological vocabulary. This is a gross overstatement (Schwartz 1991). Once one understands how a concept from a higher level of description is understood in terms of the lower level, the original term may be superfluous (in the rare case of an exhaustive type-type reduction), but it is not thereby dismissed. If the temperature of a gas can be identified with its mean kinetic energy, there is nothing wrong with saying that the temperature of the air in my room is currently 291 degrees Kelvin.

Reductive materialism and eliminativism claim too much; some variety of *nonreductive ontological naturalism* is more adequate.

1.3. A NONREDUCTIVE ONTOLOGICAL NATURALISM. Nonmaterial aspects of reality, such as music, science, and social meanings, are not studied as such by any of the natural sciences, but they seem to be always embodied in forms that are in the domain of the natural sciences,

whether as ink on paper, sound waves in the air, or neural patterns in a brain, and only as embodied do they seem to be causally efficacious. Hence, a characteristic of contemporary naturalistic scientific images is their *ontological naturalism*, resting on the assumptions articulated below.

a. The natural world is the whole of reality that we know of and interact with; no supernatural or spiritual realm distinct from the natural world shows up within *our natural world, not even in the mental life of humans.*

The word *within* has been emphasized to signal an important qualification, namely, that answers to questions about the natural world as a whole may refer to something beyond the natural world (see below, 1.4).

The *coherence* of our knowledge seems to correlate with the view that different entities are constituted from the same basic stuff, say, atoms and forces. Interactions and spatial relations between constituents are, of course, included in this view of reality; contemporary physics treats forces, particles, and space-time together. Thus, a *constitutive reductionism* is part of this scientific image.

b. Our natural world is a unity in the sense that all entities are made up of the same constituents. Physics offers us the best available description of these constituents and thus of our natural world at its most basic and detailed level of analysis.

Constitutive reduction does not imply elimination; pain does not become less real or painful when its physiological basis is unraveled. However, in many instances (even within physics, and even more when one moves from the causal descriptions offered by physics and chemistry to the functional descriptions offered by biology and "higher" disciplines) we encounter a *conceptual and explanatory nonreductionism.*

c. The description and explanation of phenomena may require concepts that do not belong to the vocabulary of fundamental physics, especially if such phenomena involve complex arrangements of constituent particles or extensive interactions with a specific environment.

With respect to living organisms, evolutionary biology has become a powerful pattern of explanation that is not primarily in terms of constituents and laws (physics) but in terms of interactions between organisms and their environments. Its explanatory schemes are primarily functional: within the constraints due to natural history, traits that contribute to the functioning of an organism (or more precisely, to the propagation of that trait in a given environment) are likely to become more abundant than competing traits that are functionally less advantageous.

d. Evolutionary biology offers the best available explanations for the emergence of various traits in organisms and ecosystems; such explanations focus on the contribution these traits have made to the inclusive fitness of organisms in which they were present.

A side remark: Some theists seek to supplement evolution with additional factors, a kind of divine guidance or lure. If such additional factors rooted in divine intelligence are supposed to make a difference, would one not expect that there would be fewer blind alleys and suboptimal solutions? Is there any evidence of foresight in evolution, for instance, in a less than optimal solution resulting in a better solution a thousand generations down the line? In that sense the success of evolutionary theory in understanding *imperfections* seems to be as much a challenge to those who would like to supplement evolution with theistic guidance as its successes in understanding successful adaptations.

1.4. ONTOLOGICAL NATURALISM IS NOT NECESSARILY ATHEISTIC. Reductionistic explanations within a naturalist framework do not explain the framework itself, as a thumbnail sketch of the sciences may illustrate. Concerning the properties of genes, a biologist may refer to the biochemist in the next office. When asked "when and where did the ninety-two elements arise?" the chemist can refer to the astrophysicist. The astrophysicist might answer in terms of nuclear processes in stars and in the early universe, referring for further explanations to the nuclear physicist and the cosmologist. This chain of referring to the person in the next office ends, if successful at all, with the cosmologist and the elementary particle physicist, the one answering the ultimate historical questions and the other exploring the most basic structural aspects of reality (Misner 1977, 97; Weinberg 1992, 242).

e. Fundamental physics and cosmology form a boundary of the natural sciences, where speculative questions with respect to a naturalist view of our world come most explicitly to the forefront. The questions that arise at the speculative boundary I will call limit questions (LQ).

The questions left at the metaphorical last desk are questions about the world as a whole, its existence and structure (and not only questions about its beginning). Such limit questions are persistent, even though the development of science may change the shape of the actual ultimate questions considered at any time. Naturalism does not imply the dismissal of such limit questions as meaningless, nor does it imply one particular answer to them. Religious views of reality that do not assume that a transcendent realm shows up *within* the natural world but understand the *natural world as a whole* as a creation dependent upon a transcendent Creator—a view that might perhaps be articulated with the

help of a distinction between primary and secondary causality, or between temporal processes in the world and timeless dependence of the world (including its temporal extension) on God—are consistent with such a naturalism.

To describe the field differently, we may distinguish between four views of God's relation to natural reality and its regularities, of which two can be labeled naturalist. These two are often conflated, to the disadvantage of the religious one.

Radical Nonnaturalism. Some religious people have no particular interest in the way the world operates; when God acts, God can do so against any laws of nature. You might see it as shifting from the automatic pilot to manual control; although on the basis of natural processes one would expect *A* to happen, God makes event *B* happen. A problem with such a view of God's relation to the world is that it adversely affects our esteem for God's creation, which is apparently of such a kind that God has to interfere against God's own creation.

Contingent Nonnaturalism. Some authors argue that God need not act against the laws of nature; there is enough looseness (contingency) in the web God created in the first place to allow for particular divine actions. This looseness might perhaps be located in complex and chaotic systems (e.g., Polkinghorne 1991; see, for some objections, Drees 1995) or at the quantum level (e.g., Russell 1995). The natural order could result in a couple of different outcomes, say *A, B, C*, and *D*, and God makes *C* rather than *A, B*, or *D* happen. This view depends on a proper role of contingency of an ontological kind in nature, whether at the quantum level or elsewhere.

Naturalism Emphasizing the Integrity of the Natural World. Naturalism need not deny the existence of such contingency in nature; perhaps quantum physics should be understood as making it clear that natural reality is to some extent hazy and underdetermined. However, it abstains from supplementing natural reality with additional supranatural determining factors. Chance can be taken as chance and not as hidden determination. Naturalism accepts that nature is, when we consider the level of causal interactions, complete, without relevant holes. Created reality, the natural world, has an integrity that need not be supplemented within its web of interactions. However, this integrity is not to be confused with self-sufficiency; it does not imply that natural reality owes its existence to itself or is self-explanatory. We need to distinguish between naturalism as emphasizing the *integrity* of the natural world, and naturalism as claiming also the *self-sufficiency* of the natural world.

Naturalism Assuming the Self-Sufficiency of the Natural World. The argument about self-sufficiency is quite different from any argument about explanations within the natural world, because here we have to do with the contingency *of* existence rather than contingency *in* existence. This is a difference that a polemical atheist like Peter Atkins slides over when he claims that science is about to explain everything. He can trace everything back to a beginning of utmost simplicity, but he cannot do this without assuming existence and a framework where certain rules apply and mathematics applies. A naturalist need not assume the self-sufficiency of the framework when seeing the framework itself as a whole that has integrity.

If a religious believer accepts naturalism as integrity, it is still possible to see God as the creator of this framework, the ground of its existence. This is best understood, in my opinion, as a nontemporal notion. When God is not seen as one who interferes, the alternative is not to see God as the creator who started it all a long time ago but rather to think of God as the one who gives all moments and places of reality their existence and order.

2. Why Not a Richer Naturalism?

Naturalism as presented here is a metaphysical position. It goes beyond the details of insights offered by the sciences in an attempt to present a general view of the reality in which we live and of which we are a part. It is a low-level metaphysics, however, in that it stays close to the insights offered and concepts developed in the sciences, rather than that it imposes certain metaphysical categories on the sciences or requires a modification of science so that it may fit a metaphysical position taken a priori.

Hermeneutical approaches, which are at odds with an epistemological variant of naturalism, may concur with the five assumptions discussed above. There are other views, however, that are at odds with this naturalism. By emphasizing the integrity of the natural world, this view excludes ontological dualisms (except for a dualism between creator and creature). Angels, ghosts, or other nonembodied minds acting in natural reality are excluded. However, there is nothing to prevent humans from discovering certain invariant truths about geometry—and thus constructing or discovering a sort of Platonic realm of timeless truths.

The label *religious naturalism*, or *empirical theology*, is used for a variety of positions similar to the view taken here. For instance, in an essay on science and empirical theology, Karl E. Peters wrote, "Human fulfillment and the ultimate source of fulfillment are to be found not beyond the spatial-temporal world but within it. If there are realms of being other than space-time nature and history (as in supernaturalism), they are beyond our ken and have no relevance to life today" (Peters 1992a, 63).

Within this stream of thought, however, many seem to dislike the prominent place given to physics in constitutive reductionism; they prefer "organic" metaphors. For instance, Nancy Frankenberry claims that "the fundamental image of nature in terms of interpenetrating fields of forces and organically integrated wholes has replaced that of self-contained, externally related bits of particles of inert matter" (Frankenberry 1992, 39). And Frederick Ferré saw a new image of the world: "If the image of the Garden, in which humanity and nature interact with balance and mutual benefit, becomes a fundamental image of our world, it will of course be easier to see how the Machine can fit—as an inorganic simplification and servant of the organic—than it is now to understand how a Garden could come to grow in the cosmic Machine." Ferré believes that the postmodern sciences "have broken sharply with the ideals and assumptions that have been identified with modern science for long centuries." He refers briefly to quantum physics, but his main example is ecology, which "includes and transcends analysis in a holistic way that is essential to its conceptual task" (1993, 95, 93, 94).

As long as it is a preference for organic metaphors, I have no objections. However, as a different view of the sciences and their description of reality, I am not convinced by the plea for an alternative view. Quantum physics, on some interpretations, introduces nonlocal correlations, but it does not thereby introduce into our picture of the world holism in a sense related to subjectivity or values. I consider revealing Ferré's statement that it is easier to understand how the Machine fits in the Garden than the reverse. He thereby largely abandons mainstream theories of evolution, which see more complex entities as products rather than as initial states. Claims about a transition from modern to postmodern science underestimate the success and the potential for further development of modern science in the way it has progressed over the last few centuries. There are interesting changes in science, which have triggered various debates in the philosophy of physics and elsewhere. Ideas on space and time, substance, and determinism have acquired a new shape. However, neither these changes in science nor these philosophical discussions warrant the claim that there has been a "reintegration of understanding with valuational intuition" (1993, 95). Science is not modified by our "valuational intuitions" but rather seems to offer the possibility of understanding their origins.

Because this is such an important area of disagreement in discussions of science and religion, let me spend a few more paragraphs on a major issue: the place of physics in the order of disciplines. Can one offer an account of our world that in its fundamental ontology is radically different from the view of the world in contemporary physics?

If the focus is on current physics, the answer must be yes. Underlying the level of particle theory there might be a quite different theory, formulated perhaps in terms of superstrings, twistors, or quantized building blocks of space-time in a yet unknown theory of quantum gravity. Such changes may well have consequences for our concepts of object, space, time, substance, and force and for ideas on determinism and causality. But such a change in physics would respect the hierarchical structuring of phenomena and of the corresponding sciences, which is more or less the backbone of contemporary science, from quarks to nuclei to atoms and molecules to macromolecules, and on to living organisms, followed by consciousness and culture. We might change our understanding of the foundation of reality, ontologically speaking, but fundamental physics is a kind of pinnacle of the building of knowledge. If physics were to change, the building would not collapse, though it might need some reorganizing.

A more radical alternative would be one that would in some way reject this overall pattern of the natural sciences and the difference between the order of knowing and the order of being (with physics fundamental in the latter though not in the former). In discussions about the relationship between science and religion, the most prominent example of such an alternative is process philosophy, which draws on the categorial scheme developed by Alfred N. Whitehead in his *Process and Reality* (1929). On this view, values and choices are relevant at the most fundamental level of reality. Physics is adequate for uninteresting entities, such as electrons or stones, whereas features that show up most clearly in human relations are characteristic of the most fundamental structure of reality; the Garden has priority over the Machine.

The attempt to develop such an alternative view of the fundamental structure is legitimate. It would be a remarkable change in the history of ideas if such an alternative organization of scientific knowledge replaced the consensus view, but it is not to be rejected a priori. Such accounts should at least be comparable in detail and precision to those of the currently dominant view. With respect to process philosophy, I am not convinced that the categorical scheme that gives a metaphysically basic role to values and choices can be developed in sufficient quantitative detail, nor do I expect it to be more adequate then the standard view. I thus see no reason to abandon the physicalist version of naturalism for an organismic one.

3. Religion in the Context of the Scientific Image

Religion is related not only to explanatory enterprises and their limit questions but also to ways of life. Any naturalist, whether religious or atheistic, should acknowledge the existence of religious traditions as

phenomena within reality. They are there, like languages and bodily features, as products of a long biocultural evolution. We have a physical memory of the past in our genes and further implicit and explicit heritage in our cultures, languages, and moral and religious traditions, passed on through example and in books. The fact that these traditions arose and were passed on from generation to generation (unlike others that disappeared) implies that surviving traditions embody well-winnowed practical wisdom that deserves attention, though in new circumstances not necessarily uncritical allegiance.

Among those who have sought to articulate an understanding of theology in the context of such a naturalist view of religion, Ralph Burhoe is the one who has emphasized most strongly the character of traditions as "well-winnowed wisdom." For him, the overwhelming power of the evolutionary process relates to our images of God's sovereignty. Gerd Theissen (1985) emphasizes the variety of adaptations that arose through evolution; he underlines tolerance or grace as the main characteristic of ultimate reality. Philip Hefner also relates "the way things are" to God; altruism and love are interpreted by Christian theology "as expression of basic cosmological and ontological principles" (Hefner 1993, 197). This need not imply that we derive religious convictions from scientific insights; in the religious myths and their interpretations reality may be disclosed in such a way as to stimulate us to spiritually and morally appropriate responses.

Aside from those who seek to identify characteristics of the evolutionary process and reality as a whole, there are also some who have sought to see religious language as language about some aspect of reality. Thus, Lindon Eaves sees it as dualistic language that we use to speak about features "lost in the mists of evolution and hidden from language and logic in the genetic code" (Eaves 1991, 499) and which we also use to articulate an *ought* in the world of *is*. Charley Hardwick's "valuational theism" also seems to be a promising proposal (Hardwick 1996).

My own view, which seeks to take evolution seriously not only as a feature of the world (an issue developed theologically by Peacocke [1993] and others) but also as the explication of human religious traditions, resembles these latter approaches in seeking to understand the function of religions *within* the evolutionary process rather than looking for some general characteristic *of* the process.

Religious traditions are complex entities. A *way of life* may be suggested by parables, as for instance that of the Good Samaritan helping a stranger from another culture (Luke 10:29–37), by historical narratives (such as various accounts of prophets protesting against injustice, or of Jesus forgiving those who persecuted him), and it may be articulated more explicitly, as in the Ten Commandments (Deuteronomy 5:6–21).

A way of life is not only a practical matter. It is oriented by an *ultimate ideal* that surpasses any actual achievable goal or situation. Thus, religious traditions include elements such as the Kingdom, Paradise, Heaven, nirvana, immortality, emptiness, openness, perfection, and unconditional love. Such notions function as regulative ideals with which actual behavior is contrasted in order to evaluate it. A tradition's way of life is affirmed and strengthened by the particular forms of worship and devotion of that religious tradition. Worship and other forms of ritual behavior express and nourish the individual and communal spirituality in relation to the joys, sorrows, and challenges of life and to the conceptions and ultimate ideals of the good life. Religious traditions are not only ways of life; believers see their religious way of life as *rooted* in certain claims about historical events, ultimate destiny, or authoritative commandments. These claims are supposed to justify the way of life espoused by a tradition as the way one should live one's life; justified because the traditions derive from an authoritative source, because they deliver future happiness, or because they correspond to the way reality is intended to be or deep down really is.

Religious variety is intelligible and valuable. However, we do not have to accept any tradition without critical scrutiny, or as a yes-or-no package deal. Change is characteristic of our history, and there is no need to exclude religious traditions from it. Circumstances may have changed and therefore models of the good life or forms of worship may have to change. This is certainly the case when we consider the human condition today: we are vastly more numerous, stand in a fundamentally different relation to nature, are more powerful than ever before, and are confronted with neighbors across the globe. Not only have our circumstances changed but so have our moral and spiritual sensitivities, for example, with respect to conflicts between ethnic or religious groups, the relations between men and women, and slavery or cruelty to animals. One more reason for change, but not the most important one, is the cognitive credibility of a tradition. If the images and claims by which the way of life used to be justified have become incredible, that too challenges the religious tradition, though more indirectly than challenges to its practical, moral, and spiritual adequacy.

Granted that we may have to discard some traditions or may have to modify them, why would one keep any such tradition alive? The reason is, in my opinion, that they are useful and powerful. They are useful and powerful not only for unreflective moments and persons but also for reflective and well-informed persons. No humans are only rational beings who can entertain all their motives and desires consciously and intentionally; the structure of our brains is such that much goes on that is not dealt with consciously. This is the risk involved in religious forms of

behavior (because so much cannot be scrutinized consciously) and the reason for their importance: through religious metaphors and forms of behavior we address reality in a way that confronts us with ideals, with what ought to be, with a vision of a better world, or with images of a paradisiacal past or an ultimate comforting presence.

At this point, authors such as Hefner and Theissen propose another argument: we entertain religious traditions because they are true to the way things really are or to the way reality ultimately is. This seems to me to be a claim that goes—when understood in a realistic way—too far beyond, if not counter to, experience. And if the religious ideals are claimed to correspond to the way reality really is, the crucial function of a tradition, namely, in providing a guiding vision that shapes our way of life by envisaging a reality different from the way things currently are, is undermined. Unless, as Hefner and others may well be taken to mean, the way things are is referring not so much to our reality as experienced as to a transcendental perspective on reality expressed through religious myths. In that sense, talking about aims and values in terms of the way things really are has its advantages; it uses a figure of speech that expresses basic trust and refers beyond one's local environment.

In this paper I have considered the variety of particular religious traditions, each functional in its own way in certain circumstances, and (in 1.4) the room for speculations on philosophical limit questions about the world as a whole.

In my view, these two approaches can complement each other. I do not mean that they together result in a complete view, but I suggest that we see them as independent contributions that can be brought together in a larger worldview. The openness expressed in the limit questions may induce a sense of wonder and gratitude about the reality to which we belong. Such a cosmological approach might primarily be at home with a mystical form of religion, a sense of unity and belonging, as well as dependence upon something that surpasses our world. The functional view of religion offers some opportunities for a prophetic form of religion, with a contrast between what is the case and what it is believed ought to be the case. The contrast might be seen as a consequence of our evolutionary past, which has endowed us with wisdom that is encoded in our constitution and in our culture (including religious traditions). Another way to articulate a prophetic element is to argue that evolution has endowed us with the capacity for imagination, for reconsidering our situation from a different perspective. This capacity has as its limit the regulative ideal of an impartial view transcending all our perspectival views. That such a point of view is inaccessible is beneficial because this protects us from fanaticism; if we were inclined to believe that our view were the final one, then we would not be inclined to self-questioning

(Sutherland 1984, 110). It is precisely in this role that a speculative approach, in response to limit questions, with a radical notion of divine transcendence may be of major significance in our dealings with particular traditions. When considered in relation to the radical concept of divine transcendence, all regulative ideals as they arise in particular religious traditions are relativized; they can never lay unrestricted claim to our allegiance.

We know collectively a great deal about our world. Our knowledge is also limited. Certain phenomena may be intractable, even though they fit into the naturalist framework. And limit questions regarding the whole naturalist framework can be posed but will not be answered. The evolutionary process has endowed us with capacities and limitations. Our knowledge and our capacity for knowledge have arisen in the midst of life, and if we are to use them anywhere at all, it will have to be there. They allow us to wonder about that which transcends and sustains our reality, but all the time we wander in the reality in which we live, move, and have our being; to its future we contribute our lives.

NOTE

Ideas expressed in this paper have been articulated not only at the annual meeting of the American Academy of Religion, 26 November 1996 in New Orleans, but also at the Sixth European Conference on Science and Theology in Kraków, Poland, March 1996; the conference on evolution and molecular biology organized by the Center for Theology and the Natural Sciences and the Vatican Observatory, June 1996; consultations of the Center of Theological Inquiry in 1994 and 1996; and in the first and fifth chapters of my *Religion, Science, and Naturalism*. I thank participants at those conferences and persons who have commented on my book for their criticisms, questions, and suggestions.

REFERENCES

Atkins, Peter. 1981. *The Creation.* Oxford: Freeman.

Barbour, Ian G. 1990. *Religion in an Age of Science: The Gifford Lectures, 1989–91, Vol. One*. San Francisco: HarperCollins.

Burhoe, Ralph W. 1981. *Towards a Scientific Theology.* Belfast: Christian Journals.

Churchland, Paul. 1981. "Eliminative Materialism and the Propositional Attitudes." *Journal of Philosophy* 78:67–90.

Drees, Willem B. 1995. "Gaps for God?" In *Chaos and Complexity: Scientific Perspectives on Divine Action.* Vatican City State: Vatican Observatory, and Berkeley: Center for Theology and the Natural Sciences. Distributed by Univ. of Notre Dame Press.

_____. 1996. *Religion, Science and Naturalism.* Cambridge: Cambridge Univ. Press.

Eaves, Lindon B. 1991. "Adequacy or Orthodoxy? Choosing Sides at the Frontier." *Zygon: Journal of Religion and Science* 26 (December): 495–503.

Eaves, Lindon B., and Lora Gross. 1992. "Exploring the Concept of Spirit as a Model for the God-World Relationship in an Age of Genetics." *Zygon: Journal of Religion and Science* 27 (September): 261–85.

Ferré, Frederick. 1993. *Hellfire and Lightning Rods.* Maryknoll, N.Y.: Orbis.

Fowles, John. 1979. *The Tree.* St. Alban's, England: Sumach Press.

Frankenberry, Nancy. 1992. "Major Themes of Empirical Theology." In *Empirical Theology: A Handbook*, ed. R. C. Miller. Birmingham, Ala.: Religious Education Press.

Hardwick, Charley D. 1996. *Events of Grace: Naturalism, Existentialism, and Theology.* Cambridge: Cambridge Univ. Press.
Hefner, Philip. 1993. *The Human Factor: Evolution, Culture, and Religion.* Minneapolis: Fortress Press.
Kitcher, P. 1993. *The Advancement of Science: Science without Legend, Objectivity without Illusions.* New York: Oxford Univ. Press.
McMullin, Ernan. 1994. "Enlarging the Known World." In *Physics and Our View of the World,* ed. J. Hilgevoord. Cambridge: Cambridge Univ. Press.
Misner, Charles W. 1977. "Cosmology and Theology." In *Cosmology, History, and Theology,* ed. W. Yourgrau and A. D. Breck. New York: Plenum Press.
Moser, P. K., and J. D. Trout, eds. 1995. *Contemporary Materialism: A Reader.* London: Routledge.
Peacocke, A. R. 1993. *Theology for a Scientific Age: Being and Becoming—Natural, Divine, and Human.* Minneapolis: Fortress Press.
Peters, Karl E. 1992a. "Empirical Theology and Science." In *Empirical Theology: A Handbook*, ed. R. C. Miller. Birmingham, Ala.: Religious Education Press.
_____. 1992b. "Empirical Theology in the Light of Science." *Zygon: Journal of Religion and Science* 27 (September): 297–325).
Polkinghorne, John C. 1991. *Reason and Reality: The Relationship between Science and Theology.* London: SPCK Press.
Russell, Robert J. 1995. "Theistic Evolution: Does God Really Act in Nature?" *CTNS Bulletin* 15:19–32.
Salmon, Wesley C. 1990. *Four Decades of Scientific Explanation.* Minneapolis: Univ. of Minnesota Press. (Also in Philip Kitcher and W. C. Salmon, eds., *Scientific Explanation.* Minneapolis: Univ. of Minnesota Press, 1989.)
Schwartz, J. 1991. "Reduction, Elimination, and the Mental." *Philosophy of Science* 58: 203–20.
Sellars, W. 1963. *Science, Perception, and Reality.* London: Routledge and Kegan Paul.
Strawson, P. F. 1985. *Skepticism and Naturalism: Some Varieties.* New York: Columbia Univ. Press.
Sutherland, S. R. 1984. *God, Jesus, and Belief: The Legacy of Theism.* Oxford: Basil Blackwell.
Theissen, Gerd. 1985. *Biblical Faith: An Evolutionary Approach.* Philadelphia: Fortress Press. (Translation of *Biblischer Glaube in evolutionärer Sicht*. Munich: Kaiser, 1984.)
Weinberg, S. 1992. *Dreams of a Final Theory.* New York: Pantheon Books.
Whitehead, Alfred N. 1929. *Process and Reality.* New York: Macmillan.