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and Warren D. Allmon

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T E N • The “God Spectrum” and the  
Uneven Search for a Consistent  
View of the Natural World

WARREN D. ALLMON

The test of a first-rate intelligence is the ability to hold  
two opposed ideas in mind at the same time and still  
retain the ability to function.

F. SCOTT FITZGERALD, “The Crack-Up,” *Esquire*  
magazine, February 1936

God, the swamplands we’re willing to wade through to  
get around the truth!

NEIL LABUTTE, *Wrecks*, 2006

Bigotry is an incapacity to conceive seriously the  
alternative to a proposition.

G. K. CHESTERTON, *London Daily News*, 1910

PREFACE

There was a time not so long ago when scientists did not take creationism seriously. As copiously demonstrated, however, in the flood of recent scientific critiques of intelligent design (ID), including in the other chapters of this volume, this is no longer the case. These responses have exhaustively demonstrated that creationism, including ID, isn’t science; it’s religion. And for most scientists, the task stops there. Yet for the great majority of the nonscientific public, this is just the beginning. For most people whose lives are primarily occupied by neither science nor religion, the bright line that the majority of scientists see as separating the two is fuzzy to nonexistent. Explicating the difference is therefore sometimes the major intellectual hurdle that any scientist, and especially any science teacher or professor, must clear—even if only perfunctorily—before his or her audience can begin to grasp the details of the geology or evolutionary biology that most of us would much rather talk about.

My experience is that the great majority of my scientific colleagues, perhaps especially geologists, are deeply uncomfortable discussing the details of the

differences between science and religion. They feel that they are not qualified, or that it's personal, or irrelevant, or inappropriate, or that they just don't have time with everything else that they have to cover in a semester or during a crowded office hour. Most of us do not explicitly engage this issue, and this, in my view, is a serious mistake. By avoiding this discussion, we avoid what (if polls are to be believed) a huge proportion of Americans hold much more dear than our precious science: religious faith. Trying to ignore religion as we attempt to communicate—and generate support for—our various scientific fields is something like trying to ignore traffic as we attempt to drive across a big city: it just can't be done. It's there, and we must deal with it.

This chapter is an attempt both to deal with religious belief in the context of the manifest practical success of modern geological and evolutionary science and to deal with science in the context of the manifest popularity of religious faith. It is my attempt to answer the question that most professors who have taught historical geology or evolution have confronted or will eventually confront: "Can one believe in both God and evolution?"

## INTRODUCTION

Science and religion are the realms of human life "that most fundamentally tell us who we are and define our relationship with the rest of the world" (Croce 1995, p. 16). Yet the relationship between these two huge spheres of human experience has never been the subject of anything approaching a consensus, among either scholars or laypeople. This has been true for more than four hundred years, since the birth of modern science, and it continues to be true today, even with an explosion of scholarly interest in the relationship, marked by the appearance of numerous publications, conferences, and organizations, and even the emergence of a formal field of religion-science studies.

Barbour (1990) proposed a useful, although perhaps overly simplistic (see chapter 9; Bryan 1999), four-fold taxonomy of views of the relationship between science and religion: conflict, independence, dialogue, and integration. The first category has a long history; science and religion have for many years been said to be in "struggle," "conflict," and even "war" (e.g., Draper 1874; White 1896; Ruse 2001b, 2005). Although rejected today by most historians of science (see, e.g., Wilson 2000; Lindberg and Numbers 2003), this point of view is carried on, ironically, by two groups who agree on little else: scientific/materialistic atheists and creationists both hold that the belief in God and the pursuit of

modern science (at least major parts of it, particularly but by no means limited to evolution and Darwinism) are utterly irreconcilable.

There is also a long history of what Barbour (2000) calls the “dialogue and integration” (what I will herein call “accommodationist”<sup>1</sup>) view of the relationship between science and religion (see, e.g., Wilson 2000; Bowler 2001; Ferngren 2002; Lindberg and Numbers 2003; Olson 2004; Witham 2005; Thomson 2005), a tradition carried on today by a large and growing number and variety of viewpoints, from the scientific, philosophical, and religious (e.g., Haught 1995, 2000, 2003, 2006; Brooke and Cantor 1998; Goodenough 1998; McGrath 1998; Polkinghorne 1998, 2005; Raymo 1998, 2005; K. R. Miller 1999; Rolston 1999, 2006; Griffin 2000; Knight 2001; K. B. Miller 2003; Kitcher 2007) to the political (e.g., Wallis 2005; Balmer 2006; Lerner 2006; Meyers 2006; Obama 2006).

Moving past this tradition of accommodation in the religious direction, we encounter the long-standing views that God must come first and that science must adjust itself to religion (not the other way around) and to the continual supernatural involvement of an all-powerful deity in the physical universe. In the United States, these views are most manifest today as modern creationism, including its most recent incarnation, intelligent design (e.g., Pennock 1999; Forrest and Gross 2004; Perakh 2004; Scott 2004; Shanks 2004; Young and Edis 2004; Jones 2005; Ayala 2006; Brockman 2006; Numbers 2006; Shermer 2006; Petto and Godfrey 2007; this volume). On the atheist side are authors who argue that science essentially demands that there is, in fact, no God at all (e.g., Provine 1987, 2006; Weinberg 1993, 1999, 2007; Dennett 2006; Dawkins 1986, 2003, 2006; Tyson 2001; Graffin 2003; Harris 2004, 2006; Atkins 2006; Wolf 2006).

At least in the United States, advocates of both extreme opinions claim that they are swimming against a strong current that threatens to overwhelm their preferred worldview. Secularists point to the rise of evangelical and fundamentalist Christianity and the overwhelming self-proclaimed religiousness of the American population. Religionists point to the dominance, particularly in the popular media and academia, of secular and atheistic views. The truth is that the United States today is awash in *both* secularism and religion—a surprising situation that Marty (2006) has labeled “religiosecular”—and American society is in important ways deeply conflicted about it (e.g., Turner 1985; Silk 1988; Lacey 1989; Lachman 1993; Fowler et al. 2004; Jacoby 2004).

Possible positions on the issue of the relationship between science and religion are, however, “many more than usually considered” (Pigliucci 2000, p. 38). Although adequate reliable data are unfortunately lacking, it is clear that the

majority of individual Americans—both scientists and nonscientists—hold neither extreme point of view, but rather views that are somewhere along a spectrum in-between: *the majority of scientists, students, and the general public in America hold opinions that combine both science and religion.*

#### SOME DEFINITIONS

Before delving further into this wide range of views, I want to be clear about how I will be using certain terms.

*Religion:* The term *religion* is “notoriously difficult to define,” as evidenced by the huge diversity of definitions that have been offered (e.g., Smith 1962, p. 17; Abernethy and Langford 1968, p. 1; Brooke 1991; Peterson et al. 2003, p. 6). Part of the problem may be the attempt to group together under one word or concept such an enormous diversity of human ideas, beliefs, and behaviors. The idea of religion, applicable to all of humanity, as distinct from individual religious faiths or traditions, may be in whole or large part a creation of modern (Western) thought; the numerous traditions generally referred to as religions of the world may, in fact, not have enough to unite them easily or usefully under a single term (Smith 1962), at least for the purposes of the discussion in this chapter. When I use the term *religion* here, therefore, it will be in reference only to the three (mono)theistic, Abrahamic faiths (Judaism, Christianity, and Islam),<sup>2</sup> which have in common the belief in the existence of a single divine, supernatural, nonmaterial, ultimate reality that interacts with the material world, especially with humanity; a “transcendent spiritual being who is omnipotent, omniscient, and perfectly good” (Peterson et al. 2003, p. 9).

*Materialism/naturalism:* Although these two words are not strictly synonymous (see, e.g., Davis and Collins 2000; Jammer 2003; Drees 2003; Flanagan 2006), I will use them interchangeably here. Two different senses of materialism/naturalism are frequently recognized: “methodological” materialism/naturalism holds that science can and should deal only with material causes for material phenomena; “philosophical” (also known as “metaphysical,” “theoretical,” “hard,” “ontological,” or “imperialistic ontological”) materialism/naturalism holds that the material world is all that exists and denies the existence of anything else. The distinction between these two senses is important, not least because it is widely maintained that it is possible and reasonable to accept the first without accepting the second (see chapter 7; Pennock 1999, p. 189ff.; Davis and Collins 2000; Forrest 2000; Numbers 2003; Scott 2004, pp. 65–68; Flanagan 2006; Rolston 2006).

---

A←-----B-----C-----D-----E-----F-----→G

*More religious*

*Less religious*

- A. A supernatural (nonmaterial) God designed and created the entire material universe and has maintained and guided it through all time by continuous or frequent specific intervention at any time he/she/it so desires and in any manner, including suspension of known physical laws.
  - B. A supernatural (nonmaterial) God designed and created the entire material universe and has maintained and guided it through all time by continuous or frequent specific intervention, but this intervention occurs in accord with known physical laws (e.g., quantum indeterminacy).
  - C. A supernatural (nonmaterial) God designed and created the entire material universe, including physical laws, but since then has let those laws govern the universe and has not physically intervened.
  - D. A supernatural (nonmaterial) God may or may not have designed and created the entire material universe but is somehow immanent in that material universe, including in living things, and necessary for its continued existence.
  - E. A supernatural (nonmaterial) God exists, but not in any measurable material sense or fashion that materialistic science could ever detect or describe, and this God communicates in some identifiable way (consciously or unconsciously) with human beings.
  - F. Some kind of supernatural (nonmaterial) entity or phenomenon may exist but, if so, humans may or may not ever know this with certainty nor ever know with any confidence anything specific about it or its activity or effects.
  - G. There is no supernatural (nonmaterial) God or anything else that is other than the material universe of matter and energy.
- 

FIGURE 10.1

“The God Spectrum” as discussed in this chapter.

#### THE SPECTRUM OF BELIEF AND ITS IMPLICATIONS

The reality and population of this spectrum of belief, which I will herein call the God Spectrum (figure 10.1), has major implications for those of us who seek to support science education in general, and to promote and teach historical geology



and evolution in particular. This is the point of departure for this chapter. I am concerned here with two separate but related topics. First is the question of the nature of nature—what exists and what doesn't, what its properties are, and what happened or didn't in the past—what Pennock (1999, p. 40) calls “the truth of nature and the nature of truth.” Second is the question of how scientists can and should communicate with the public about these topics. I write from my point of view as both a practicing research scientist and an educator and museum director. I want both to understand what the universe is really like, *and* learn how I can most effectively share scientific understanding with others, from preschoolers to college students to senior citizens. I am acutely aware that these perspectives are not always easy to reconcile or amenable to the same kinds of solutions. Although one could obviously present this treatment in a variety of ways, my approach throughout this chapter is to address the issue of education and communication, and let insights about the nature of reality emerge from there.

Although it is widely believed that American academia is currently dominated by secular, “liberal” views (e.g., Marsden and Longfield 1992; Marsden 1996; K. R. Miller 1999; Roberts and Turner 2000), the American public—including the student bodies of most colleges and universities—is clearly overwhelmingly religious. Thus, when academic scientists teach, speak, and write publicly about science in general, and evolution and Earth history in particular, we frequently encounter questions about whether these areas are compatible with religion (e.g., Scott 1996, 1999; Kelley 1999, 2000). In my experience, most teachers and communicators of science to the public respond to such questions in one of three ways: (1) a few of us say that the methods of science and religion are utterly and irreconcilably different and that intellectual honesty requires that one must choose between them; (2) many say that science and religion are not mutually exclusive and can in principle be accommodated, but we do not explain this accommodation in much detail; or (3) most avoid the issue entirely.

If we choose the first option, most of our students and audience will almost certainly select religion rather than science, and this is increasingly dangerous from the point of view of trying to teach and promote science. If we choose the second option—because we think (or hope) either that it's true or that our listeners will thereby be more likely to accept and learn the science—the potential problems are several. Although religion and science may not necessarily be mutually exclusive, it is, however, the case that many practicing scientists who say they are personally religious are not usually very clear or consistent about the implications of holding both outlooks. Furthermore, *not all religious beliefs are consistent or compatible with*

*science*, and so a broad and unqualified statement of accommodation is, in fact, inaccurate. If we choose the third option, we are simply being intellectually lazy and not doing our jobs.

I would like to propose that there is a fourth response. We can say that science and religion are both important approaches that humans use to understand the world, and that there *are* views, held by both respectable theologians and respectable religious scientists, that *God exists and acts in real but nonmaterial ways that are not accessible to or relevant to scientific study of the material world*. In this direction lies an avenue of potentially genuine accommodation between religion and science. This fourth response suggests that there may exist a separate, nonmaterial reality, utterly and permanently inaccessible to the methods of science, and that humans access and interact with this separate reality in ways that scientists, *when working as scientists*, do not. Human understanding of this separate reality can be pursued only by the tools of faith and theology, and perhaps—like the conclusions of science—will always be incomplete and provisional. The existence of this separate reality, however, does not impinge on material reality, for the understanding of which naturalistic science is clearly the best means at our disposal.

If we choose this fourth option, and explain that there *are* legitimate religious views that allow for a supernatural deity *and* are not inconsistent with materialistic science and we explain how, then this may increase the likelihood that our audiences will be able to hear what we say about science in general, and evolution and historical geology in particular. This fourth choice, however, has some major caveats. First, we may not believe it ourselves. Yet, importantly, this does not mean that we can prove scientifically that it is *not* correct. Second, these scientifically acceptable religious views may not grant legitimacy to all or even most of the beliefs of most religious persons. Most prominently, it is difficult, if not impossible, to reconcile any notion of “miracles” with a defensibly consistent scientific worldview. Lastly, this approach may come perilously close to telling students what they can believe in order to do science.

In this chapter I argue that very few of the positions on the God Spectrum—neither those on the ends, nor those in the wide middle—have been explained by their advocates in what I would call sufficiently clear or consistent detail. That is, these individuals have largely failed to clearly identify and resolve potential conflicts or inconsistencies between materialistic and religious viewpoints. Some, perhaps many, people do not see this lack of logical consistency as a problem. I do. I also try to assess what the population density may be along this spectrum of belief—among both the general public and scientists—and I analyze opinions held

by scientists, theologians, and philosophers whose views fall at various points along the spectrum. Finally, I offer some modest suggestions for how evolutionists and historical geologists, and particularly educators in these subjects, might proceed.

## SEPARATE BUT EQUAL: SCIENCE AND RELIGION AS A NONCONTINUUM

Before examining the evident continuum of views linking naturalistic science and religious belief in the supernatural, I first need to consider whether such a continuum can exist at all, that is, whether science and religion are even addressing the same subjects or whether they are completely distinct.

The idea of science and religion as separate but equal realms of human experience—labeled by Gould (1997, 1999) as “non-overlapping magisteria,” or NOMA—holds that neither can nor should make claims on the other’s legitimate domain of influence. “No scientific theory, including evolution,” wrote Gould, “can pose any threat to religion, for these two great tools of human understanding operate in complementary (not contrary) fashion in their totally separate realms: science as an inquiry about the factual state of the natural world, religion as a search for spiritual meaning and ethical values” (2001, p. 214). Gould clearly saw this as a very important social issue: “People of goodwill wish to see science and religion at peace, working together to enrich our practical and ethical lives” (1999, p. 4). “[T]he myth of a war between science and religion remains all too current,” he wrote, “and continues to impede a proper bonding and conciliation between these two utterly different and powerfully important institutions of human life. How can a war exist between two vital subjects with such different appropriate turfs—science as an enterprise dedicated to discovering and explaining the factual basis of the empirical world, and religion as an examination of ethics and values?” (1995, pp. 48–49). We need science to do what it does, he argued, but “we will also need—and just as much—the moral guidance and ennobling capacities of religion, the humanities, and the arts, for otherwise the dark side of our capacities will win, and humanity may perish in war and recrimination on a blighted planet” (2001, p. 269).

Science can supply information as input to a moral decision, but the ethical realm of “oughts” cannot be logically specified by the factual “is” of the natural world—the only aspect of reality that science can adjudicate. . . . I

win my right to engage moral issues by my membership in *Homo sapiens*—a right vested in absolutely every human being who has ever graced this earth, and a responsibility for all who are able. If we ever grasped this deepest sense of a truly universal community—the equal worth of all as members of a single entity, the species *Homo sapiens*, whatever our individual misfortunes or disabilities—then Isaiah’s vision could be realized, and our human wolves would dwell in peace with lambs, for “they shall not hurt nor destroy in all my holy mountain.” We are freighted by heritage, both biological and cultural, granting us capacity both for infinite sweetness and unspeakable evil. What is morality but the struggle to harness the first and suppress the second? (Gould 1995, p. 318)

NOMA, however, did not fare well among theologians, philosophers, or evolutionists (see, e.g., Ruse 1997; Goodenough 1999; Orr 1999; Pigliucci 1999; Coyne 2000; Haught 2000, 2003; Watson 2000). One important reason for this less-than-enthusiastic reception lay in Gould’s definition of religion. To have religion not conflict with science, said critics, Gould had to define religion in a way that excluded much of what religious people value, namely the actual existence and action of supernatural forces. To make NOMA work, said theologian John Haught, for example, Gould had to “first reduce ‘religion’ to ethics” (2000, p. 25). Gould could reconcile science and religion, Haught later elaborated, only

by understanding religion in a way that most religious people themselves cannot countenance. Contrary to the nearly universal religious sense that religion puts us in touch with the true depths of the real, Steve denied by implication that religion can ever give us anything like reliable knowledge of *what is*. That is the job of science alone. As far as Steve was concerned, our religious ideas have nothing to do with objective reality. Scientific skeptics may appreciate religious literature, including the Bible, for its literary and poetic excellence. But they must remember that only science is equipped to give us factual knowledge. Doubters may enjoy passages of Scripture that move them aesthetically, or they may salvage from religious literature the moral insights of visionaries and prophets. . . . Still, Steve could not espouse the idea that religion in any sense gives us truth. No less than Dennett and Dawkins, when all is said and done, he too held that only science can be trusted to put us in touch with what is. At best, religion paints a coat of “value” over the otherwise valueless “facts” disclosed by science. Religion can enshroud reality with “meaning,” but for Steve this meaning is not intrinsic to the universe “out there.” It is our own creation. (2003, pp. 6–7)

Ultimately, and ironically, NOMA failed to convince because it was an attempt to do what Gould himself consistently criticized in others: make reality match our hopes. His family background and intellectual leanings made him a nonbeliever in religion, but his cultural heritage imbued him with a deep appreciation of the value of many aspects of religion. His abiding humanism compelled him to seek and find a personal reconciliation of science and religion, but the religion that he thought could coexist in such equality with science is a religion that few believers accept (see Allmon 2009, for further discussion).

## THE GOD SPECTRUM

By God Spectrum (figure 10.1), I mean the variety of belief in the amount of direct involvement (“causal commerce”; Flanagan 2006, p. 433) of a supernatural deity in the day-to-day operations of the physical universe, from the extreme supernatural end—in which a supernatural deity can and does do anything at any time, regardless of the laws of nature—to the extreme materialistic end—in which there is no God or supernatural deity.

At the supernatural end is the belief that God has always been closely and intimately involved in all aspects of the physical world—in the case of evolution, for example, he has been creating as he goes. Mechanistically, this can be as supernatural and filled with miracles and divine purpose as one would like. As we move away from this end of the spectrum, however, we encounter the views of many self-described “liberal to moderate” Christians (including at least some practicing scientists), that God has worked mainly through natural laws, suspending them only every once in a while for his own purposes. (I like to think of this point of view as similar to the role of most parents when their child goes to college. The child is on his or her own in some respects, but not completely. The parents don’t love the child in just a passive way; they help out in significant ways.) As we move still farther along the spectrum, we eventually cross a line. On one side is an active God; on the other an inactive God. Some people believe that there is a God who created all we see around us, but who has not been involved with the physical world in any significant way since that creation ended. (This might be thought of as similar to the role of most parents when the child is an adult and living and working elsewhere; they still love their child and that makes the child feel good, but they no longer send money.) Somewhere in this area of the spectrum is the view that God exists but science simply can have no opinion on the matter. This may be the closest to what Darwin himself believed at the end of his life.

Other authors have proposed frameworks similar to figure 10.1 to communicate the range of views about the relationship between science and religion. Scott (1997; 2004, p. 57) presents perhaps the fullest version of such a “continuum of religious views.” Dickerson (1990) similarly rejects the “radical dichotomy” between science and religion, which is limited to consideration of only two alternatives, in favor of a spectrum of views. My emphasis here, however, is more on the nature of God’s *activity* than on the associated belief system(s), and on analysis may thus be most similar to the “Fuzziness of the God concept” of Pigliucci (2002, p. 180). In a similar vein, the anthropic principle has been described by Barrow and Tipler (1986) as less a single perspective and more an array of views about the role of an intelligent designer in making the universe habitable. Dawkins (2006, pp. 50–51) also describes a “spectrum of probabilities” for the existence of God. His spectrum, however, is difficult to apply to the issues I address here because (although he does refer to “versions” of his “God hypothesis”; e.g., 2006, p. 58) Dawkins appears to insist that God of a fixed sort either exists or does not, and leaves little room for discussion of various different ways in which God might act in the world, ways that fall somewhere along the spectrum shown in figure 10.1.

#### COMPLETE NATURALISM: “THE GOD DELUSION”

The extreme materialistic end of the God Spectrum (“G” in figure 10.1) has a long history, much of which is frequently described as the steady increase in secularity of modern society. Although it is certainly true that numerous predictions about the imminent disappearance of religion have proven to be incorrect (e.g., Berger et al. 1999; Stark 1999; McGrath 2004), it is also true that, at least in most Western countries across the industrialized world, organized religion today has less direct impact on the daily lives of people, governments, and institutions than it did a century and a half ago (e.g., Chadwick 1993; Bruce 2002). This change, whether it is called “secularism” or “secularization” (e.g., Hollinger 1989; Stark 1999), while neither inevitable nor irreversible, is an undeniable long-term trend in Western society, which has accelerated—albeit unevenly—over the past hundred years (Hollinger 1989; Croce 1995; Jacoby 2004; Weinberg 2007). Although clearly not all of this change was caused by science (e.g., Numbers 2003), the trend is seen by many historians as a result of the success and accompanying rise in social status of science. Furthermore, ever since the very beginnings of modern science, some (although certainly not all) of its advocates have in fact also been forceful

advocates for antireligious viewpoints (Hollinger 1989; Numbers 2003; Thomson 2005).

“God,” says Richard Dawkins, who is perhaps the most vocal and well-known contemporary advocate of this view, is “a pernicious delusion” (2006, p. 31). “Science is the only path to understanding,” writes chemist Peter Atkins. “It would be contaminated rather than enriched by any alliance with religion” (Atkins 2006, p. 124). “You clearly can be a scientist and have religious beliefs,” says Atkins. “But I don’t think you can be a real scientist in the deepest sense of the word because they are such alien categories of knowledge” (quoted in Larson and Witham 1998, p. 313).

Historian of evolutionary biology William Provine similarly argues that it is simply impossible to accept both a traditional, personal God and Darwinism:

It is still possible to believe in both modern evolutionary biology and a purposive force, even the Judeo-Christian God. One can suppose that God started the whole universe or works through the laws of nature (or both). There is no contradiction between this or similar views of God and natural selection. But this view of God is also worthless. Called Deism in the seventeenth and eighteenth centuries and considered equivalent to atheism then, it is no different now. A God or purposive force that merely starts the universe or works through the laws of nature has nothing to do with human morals, answers no prayers, gives no life everlasting, in fact does nothing whatsoever that is detectable. In other words, religion is compatible with modern evolutionary biology (and indeed all of modern science) if the religion is effectively indistinguishable from atheism. (Provine 1987, pp. 51–52)

Philosopher Daniel Dennett agrees, and argues that accommodation of Darwinism with religion is impossible because they are inherently irreconcilable. If we had the courage to look squarely at what Darwinism really tells us about the way life works, Dennett insists, we would see that any notion of divine influence in nature is “cognitively empty.” Those biologists “who see no conflict between evolution and their religious beliefs” are refusing to face incontestable scientific facts (Dennett 1995, p. 310).

Similarly, neuroscientist Sam Harris argues that accommodation between science and religion is misguided because it is impossible to separate religion from statements about nature, and if these statements are then refuted, this is an unavoid-

able strike against religion: “The core of science is not a mathematical model; it is intellectual honesty. Every religion is making claims about the way the world is. These are claims about the divine origin of certain books, about the virgin birth of certain people, about the survival of the human personality after death. These claims purport to be about reality” (quoted in G. Johnson 2006a; see also Harris 2004, 2006).

The many critics of this view have argued, however, that although Darwinism—like all materialistic scientific explanations—makes an interventionist God redundant and unnecessary, it does not *require* that God not exist, nor does it falsify the hypothesis that God exists (e.g., Cartmill 1998; Pennock 1999; Scott 2004; Ruse 2001a, 2007). This follows from the distinction between methodological and philosophical naturalism, as defined earlier: use of the first is required by the logic of science, but science does not require the second. God may be (as Laplace famously may or may not have told Napoleon) unnecessary for scientific explanation, but this does not scientifically falsify God’s existence.

These critics focus on several problems of the extreme atheistic view. First of all, “there is a simple matter of logic: ‘not necessary that X’ does not imply ‘necessarily not X’ or even ‘not X’” (Pennock 1999, p. 334). Second, science by definition is not concerned with the supernatural: “Science,” says Pennock, “excludes appeal to supernatural entities as a point of method, and thus it is improper to draw directly the atheistic conclusion that God is ontologically unreal from evolution or any other scientific conclusion” (1999, pp. 335–36). Even if it wanted to, science could not test hypotheses about the supernatural. Because “explanations involving the supernatural cannot be tested or falsified, science cannot employ supernatural explanations. Science cannot confirm or deny the existence of the supernatural, or a Creator. Such questions are simply beyond the realm of science” (Kelley 2000). In “any situation, any pattern (or lack of pattern) of data is compatible with the general hypothesis of the existence of a supernatural agent unconstrained by natural law . . . supernatural hypotheses remain immune from disconfirmation” (Pennock 1999, p. 195).

Pennock admits, “it is true that, if someone thought that the biological version of the teleological argument [which “tries to prove the existence of God by saying that God is necessary to explain the apparently designed character of creatures and the fit of organisms to their environments” (1999, p. 333)] was the only reason to believe in the existence of God, then [Darwinian] evolution would indeed be likely to lead that person to atheism” (p. 334). But, as Pennock and many others have noted, almost every theist has more than one reason to believe in God, and



“proofs” of God’s existence are not usually among the most persuasive (see, e.g., Hasker 1986; Ruse 2007).

Finally, there is an important criticism that is based on neither philosophy nor science. Critics of the extreme atheistic view have observed (correctly, in my view) that in the stridency—even harshness—of their advocacy for secularism, atheists are actually doing more to hurt the cause of science than to help it. There is a fine line between the intellectual honesty of calling a spade a spade and the intellectual bullying of sticking your finger in your opponent’s eye; by crossing this line, extreme atheists are giving undecided Americans reasons to move away from, rather than toward, science in general and evolution in particular (e.g., Krauss 2006; Ruse 2007). As Krauss puts it: “Science does not make it impossible to believe in God. We should recognize that fact and live with it and stop being so pompous about it” (quoted in G. Johnson 2006a).

Exactly how widely held such atheistic views are among scientists in general is much more difficult to determine than quoting selected opinions. In the only recent general survey, Larson and Witham (1997) found that around 40 percent of a random sample of 1,000 U.S. scientists from a variety of disciplines believe in a “personal God” (defined as “a God to whom one may pray in expectation of receiving an answer”). This figure was remarkably close to the result obtained in a similar survey eighty years earlier (Leuba 1916). However, in a survey of 255 biological and physical scientists who are members of the U.S. National Academy of Sciences (NAS), Larson and Witham (1998) found that only 7 percent expressed belief in a personal God, and this number was lower than in results of comparable surveys of “greater” scientists in 1914 and 1934. Similarly, in a survey of 151 evolutionary biologists who are members of national academies of science in twenty-two countries, Graffin (2003; Graffin and Provine 2007) found that 80 percent do not believe in a traditional God (defined as “an entity that exists beyond the scope of our observations that is responsible for designing and maintaining life on earth”), and only 5.4 percent do believe in such a God.

Based on these results, it seems that although the great majority of “leading” scientists are effectively atheists, a significant proportion of scientists in general accept some form of supernatural deity. (It would be fascinating to know what proportion of practicing evolutionary biologists, paleontologists, and historical geologists who are *not* NAS members say they believe in a personal God. To my knowledge, no such survey has ever been conducted.) Thus it appears to be the case that as many as two in five American scientists are *not* atheists, and evidently get along quite well professionally in this condition.

Much more is known, of course, about the religious views of the American public. Polls are consistent in reporting that a very large percentage of the American public identify themselves as believers and only a small percentage as atheists. A 2006 Harris poll, for example, found that 88 percent of those surveyed were “absolutely” or “somewhat certain” that God exists, while only 12 percent were “absolutely” or “somewhat certain” that God does not exist.<sup>3</sup> This finding is roughly consistent with those of previous polls. A 2006 CBS News poll found that 82 percent of those surveyed believed in God, while 9 percent believed in “some other universal spirit or higher power,” 8 percent believed in neither, and 1 percent were unsure. A 1998 Harris poll and a 2000 *Newsweek* poll both found that 94 percent of American adults surveyed said they believed in God.<sup>4</sup>

Most Americans, furthermore, say they do not hold positive opinions about atheism: “That label [atheist] evokes a strong negative response in American life. . . . It is religion, having a faith, that makes people, in the American context, seem trustworthy, like good citizens and good neighbors. So if you don’t have that as a moral boundary, you’re an outsider, an other, and, perhaps, a dangerous other” (Edgell 2006; see also Edgell, Gerteis, and Hartmann, 2006).

COMPLETE SUPERNATURALISM:  
“THE OVERTHROW OF MATERIALISM”

At the extreme other end of the God Spectrum (“A” in figure 10.1), we find creationists of a wide variety of stripes, including advocates for intelligent design. The modern ID movement was founded in the early 1990s, but it found its true legs with the infamous Wedge Document, leaked on the Internet in 1999 (see P. E. Johnson 2000 for a spirited defense of the document, and Forrest and Gross 2004 for a thorough critique; see Discovery Institute 2003 for an authentic copy of the document and an official response to critics). According to the Wedge Document, the movement’s goals include “nothing less than the overthrow of materialism and its cultural legacies,” and replacing science as currently practiced with “a science consonant with Christian and theistic convictions.” Thus, ID “aspires to change the ground rules of science to make room for religion, specifically, beliefs consonant with a particular version of Christianity” (Jones 2005, pp. 28–29).

I cannot help but suspect, however, that (despite their protestations to the contrary; see Discovery Institute 2003) the authors of the Wedge Document either have not really thought their arguments through very carefully or are simply being dishonest, inconsistent, or muddleheaded. How do they, for example, reconcile

accepting some aspects of materialistic science (e.g., medicine, agriculture, and engineering), while rejecting others (evolution by natural selection)? The answer appears to be simply that they *don't* reconcile these views. Rather, they pick and choose the science they like—that which does not appear to threaten their worldview—while rejecting the science they perceive as damaging to Western, Christian, socially conservative ideals.

Pennock (1999) has analyzed what one might call this “consistency conundrum” in some detail. He notes, as have others, that modern creationism is attacking not just evolutionary biology and historical geology, but almost every other field of science as well. He writes that “to toss evolutionary theory and scientific naturalism onto the pyre would be to commit much of the rest of science to the flames as well” (Pennock 1999, p. 340), and he expands on what this would mean for practitioners in those other fields as well as for those who use their results.

Science is godless in the same way that plumbing is godless. Evolutionary biology is no more or less based on a “dogmatic philosophy” of naturalism than are medicine and farming. Why should [ID advocate Phillip] Johnson and his allies find methodological naturalism so pernicious and threatening in one context and not in others? Must we really be seriously “open-minded” about supernatural explanations generally? . . . Surely it is unreasonable to complain of a “priesthood” of plumbers who only consider naturalistic explanations of stopped drains and do not consider the “alternative hypothesis” that the origin of the backed-up toilet was the design of an intervening malicious spirit. Would it not be bizarre to reintroduce theistic explanations in the agricultural sciences and have agronomists tell farmers that their crop failure is simply part of God’s curse upon the land because of Adam’s disobedience, or suggest that they consider the possibility that the Lord is punishing them for some moral offense and that it might not be fertilizer they need but contrition and repentance? (Pennock 1999, pp. 282–83)

Consider the medical sciences. It was once commonplace to attribute the origin of certain illnesses to curses or demonic possession. . . . If we accept the intelligent-design creationist’s diagnosis, medical schools and research physicians are doing a terrible disservice by not teaching students how to perform exorcisms and by not taking seriously the possible supernatural origins of diseases. (Pennock 1999, p. 283)

If it is science’s naturalistic methodology that is inherently problematic, then Johnson should be equally worried about chemistry and meteorology and electrical engineering. He should also be concerned about automobile me-

chanics, for this field too proceeds under the assumption that God does not intervene in the workings of the motor. But surely no one thinks that these naturalistic sciences imply that God does not exist. (Pennock 1999, p. 333)

Paraphrasing Dennett (1995), Michael Ruse makes the same point: “If we were falsely accused in court, for example, we would be very upset if the judge simply threw out the evidence in our favour and intuited the ‘truth.’ And we would think you slightly crazy if you went to a surgeon who was guided solely by a little voice from within” (Ruse 2001a, p. 140).

Advocates of ID claim that they are challenging the “philosophy of scientific materialism, not science itself” (Discovery Institute 2003). This is a useful rhetorical approach in their public statements as it allows them to appear moderate and reasonable, and unthreatening to fields such as medicine, engineering, and agriculture that have obvious personal and economic benefits. Yet they never deal with the central problem of this approach: there can be no science in any meaningful sense of the word *without* at least methodological materialism (as defined earlier). Allowing (or compelling) science to include the possibility of nonmaterial, supernatural causes would ultimately destroy science, because resorting to such causes is always possible, fails to spur deeper investigation, and leads to no additional understanding. “Without the binding assumption of uninterrupted natural law there would be absolute chaos in the scientific worldview,” says Pennock. “Supernatural explanations undermine the discipline that allows science to make progress.” They are too easy and therefore are “the explanation of last resort” and “the poor person’s explanations, or rather, the explanations of the intellectually poverty-stricken, since they are available for free” (Pennock 1999, p. 294).

Such predictions of catastrophe might be dismissed as hyperbole, except that the very definition of science was indeed assaulted directly through the political process in 2004–2005 when the Kansas State School Board voted to change the definition of science in the state standards so as to allow for supernatural causes to be included as potentially valid explanations for natural phenomena. In November 2005, the language in the standards (adopted in 2001) was changed from “Science is the human activity of seeking natural explanations for what we observe in the world around us” to “Science is a systematic method of continuing investigation that uses observation, hypothesis testing, measurement, experimentation, logical argument and theory-building to lead to more adequate explanations for natural phenomena” (Overbye 2005). (On February 13, 2007, the Kansas State Board of

Education rejected the 2005 revision, reestablishing science as restricted to the investigation of physical phenomena.)

How do creationists deal with the consistency conundrum? What does Phillip Johnson do when he gets sick or wants to have his car repaired? He appears to want us to believe that he uses science, and the technology that comes from it, just like the rest of us: “The possibility that divine intervention may occur . . . emphatically does not imply that all events are the product of an unpredictable divine whimsy” (P. E. Johnson 1995, p. 92). But, as Pennock points out (1999, p. 298), Johnson never explains what the methods are for determining when divine intervention is and is not to be considered potentially responsible for a particular event. Other creationists, while acknowledging that some theologies may describe God as capriciously and frequently intervening in the natural workings of the world, argue that a correct Christian theism “holds that secondary causality [causation by natural laws] is God’s usual mode and primary causality [direct divine acts or miracles] is infrequent, comparatively speaking,” and that science should not defer to such primary causality “willy-nilly” (Moreland 1989, p. 226, quoted in Alters and Alters, 2001, p. 151). But, again, there is no definition of “willy-nilly.” Like all attempts at “scientific” creationism, ID thus want it both ways: materialistic science when it suits them and supernatural intervention when it doesn’t, with no objective rules or regularities to explain or predict why one and not the other in any particular case.

#### ACCOMMODATION: THE BROAD MIDDLE

##### *Accommodation among Nonscientists*

Moving away from the extremes of the spectrum (“B” through “F” in figure 10.1) means admitting the possibility that not everything in the universe is completely and necessarily caused by only material phenomena, and that some kind of supernatural force may be involved, occasionally or continually, either only in the past or continuing into the present. The view that religion and naturalistic science can be accommodated also has a very long history. Ruse (2001a, p. 51), for example, attributes to Augustine (354–430 CE) “the influential thesis that Moses (the supposed author of Genesis) had to write in metaphorical or allegorical form, because the ancient Jews were untutored in science. What Moses said was not false, but not necessarily the literal truth.” Similarly, John Calvin’s “famous doctrine of accommodation” (as Ruse puts it) “recognized that the Bible is sometimes written in such a form as to make itself intelligible to scientifically untutored folk who would not have

followed sophisticated discourse” (2001a, p. 53). In other words, because the works of God as represented by scientific observation of the natural world cannot by definition contradict the word of God represented in scripture, if a literal reading of scripture contradicts scientific conclusions, there is room for interpretation that would render scripture consistent with nature. (William Jennings Bryan made essentially the same concession on the witness stand in the 1925 Scopes trial.)<sup>5</sup>

One of the strongest arguments against the “conflict” model of interaction between science and religion is the historical observation that both Catholic and Protestant Christianity have in a variety of ways been important nurturers and supporters of scientific pursuits at various times over the past thousand years (e.g., Merton 1938; Hooykaas 1972; Cohen 1990; Lindberg 1992; Harrison 1998; Heilbron 1999; Grant 2001). Similarly, despite the flurry of controversy after publication of *On the Origin of Species* in 1859, among “sophisticated churchmen” in Europe and America there was initially considerable accommodation between Darwin and religion (e.g., J. R. Moore 1979; Livingstone 1984; Roberts 1988). The mid- to late nineteenth century was, furthermore, a time in which the accommodation of science and religion was of particular popular interest in both Britain and America (Kloppenbergh 1986; Croce 1995). Yet this accommodation was not always especially clearly thought out nor were there abundant calls for its intellectual consistency. As noted by Kazin (2006), in the mid-nineteenth century,

popular religion [in America] skirted the grand controversy between faith and science. . . . While Darwinism led theologians to either shudder at or guardedly welcome what one historian calls “the breakup of an intellectual system that had endured from the beginning of European civilization,” most Protestants seemed comfortable both with a supernatural faith and with the rigors and pleasures of modern America. They prayed every day and went to the theater on Saturday, agreed that one could not serve both God and Mammon yet consumed at least as lavishly as their incomes allowed, fretted about the afterlife and fought for their rights in the present. Bathing their faith in sentimental hues, ordinary Americans ignored what appeared to seminarians and philosophers as glaring contradictions. William James once tried to explain the motivations of religious Americans . . . [when he said]: “As a rule we disbelieve all facts and theories for which we have no use.” Outside the lecture hall, few Christians doubted the utility of their own convictions. (p. xviii)

In many respects, this same ambivalent accommodation today represents the mainstream of liberal-to-moderate America. This view is reflected in many areas

of public discourse, including most notably the judicial opinions that have successfully kept creationism out of science classrooms in public schools. In his resounding opinion against allowing ID into the Dover, Pennsylvania, public schools, federal judge John E. Jones III, wrote, “Both Defendants and many of the leading proponents of ID make a bedrock assumption which is utterly false. Their presupposition is that evolutionary theory is antithetical to a belief in the existence of a supreme being and to religion in general. Repeatedly in this trial, Plaintiffs’ scientific experts testified that the theory of evolution represents good science, is overwhelmingly accepted by the scientific community, and that it in no way conflicts with, nor does it deny, the existence of a divine creator” (2005, p. 136).

Leading advocates for evolution in public schools go to great lengths to say and show that evolution and religion are not incompatible. Richard Dawkins (2006, pp. 66–69) has labeled this approach “the appeasement lobby” and “the Neville Chamberlain school of evolutionists” (see Ruse 2007 for a rebuttal of this label).

The strength of students’ emotional ties to their religious beliefs cannot be overemphasized, and neither can the potential for negative educational outcomes when students feel that their beliefs are in conflict with what they’re being taught. . . . The way for science instructors to deal with the issue [of whether evolution and the Bible are in conflict] is by helping students understand that evolutionary science doesn’t deny the existence of a supreme being—that evolution simply doesn’t address such non-scientific questions. (Alters 2006, pp. 117–18)

If evolution is presented as antithetical to religion (which is precisely how organizations such as the Institute for Creation Research present it), it is no wonder that a high percentage of Americans reject it. . . . As teachers and scientists, we need to leave an opportunity for the religious individual to work out the accommodation according to his or her beliefs, and not slam the door by inserting extra-scientific philosophical statements about purpose and meaning into our discussions of evolution. (Scott 1996, p. 17)

Evolution does not necessarily lead to atheism, and if defenders of evolution regularly made this clear it might open the fearful hearts of their audience, which is the first step to opening their minds to the evidence. . . . Defenders of evolution would help their case immeasurably if they would explicitly reject the creationists’ contention that evolution is atheistic, and reassure their audience that morality, purpose, and meaning are not lost by accepting the truth of evolution. (Pennock 1999, pp. 336–37)

If we are able to calm the divisive fears that evolution is the root of an atheistic philosophy that leads to purposelessness and immorality and reassure the creationist that evolution does not bar the roads to meaningfulness, then, and perhaps only then, will the creationist controversy be put behind us so that we can travel those roads together. (Pennock 1999, pp. 339–40)

The value of this argument is highlighted by a story related to me by evolutionary biologist Douglas Futuyma (pers. comm., April 2006):

Jim Elser, ecosystem ecologist at Arizona State University, teaches a biology course for nonmajors, and for a few years has polled students (after discussing what science is and why “scientific creationism” isn’t science) on their view of whether or not scientific creationism should be taught as a scientifically valid alternative to evolution. In the past, an overwhelming proportion of the students say yes, it should be. This year, he gave them an assignment to learn about the position that one of the major religions (assigned at random to a student) takes on evolution. The poll results were exactly opposite to last year’s; the great majority of these students say that creationism should NOT be taught! Elser thinks that this is the consequence of learning, by active research, that most religions do not exclude belief in evolution.

Evidence to support this claim of nonconflict comes in the form of numerous religious denominations and leaders who have gone on record as insisting that evolution and religion can be and are readily accommodated with each other. In 1969, for example, the United Presbyterian Church in the U.S.A. set, and in 1982 and 2002 reaffirmed, its official position that “there is no contradiction between an evolutionary theory of human origins and the doctrine of God as Creator.” In 1992, the United Church of Christ stated, “We acknowledge modern evolutionary theory as the best present-day scientific explanation of the existence of life on Earth; such a conviction is in no way at odds with our belief in a Creator God.” Other major denominational organizations, including the American Jewish Congress, the Central Conference of American Rabbis, the General Convention of the Episcopal Church, the Unitarian-Universalist Association, and the United Methodist Church all have over the past twenty-five years issued statements opposing teaching “scientific creationism” in the public schools. The plaintiffs in the landmark 1981 Arkansas case *McLean v. Arkansas Board of Education*, who successfully sought to overturn the imposition of “balanced treatment” for creationism and evolution in the public school classroom, included Jewish, United Methodist,



Episcopal, Roman Catholic, African Methodist Episcopal, Presbyterian, and even Southern Baptist clergy (see Matsumura 1996 for details).

Despite the uneven relationship of the Roman Catholic Church with science in general, and Darwinism in particular (G. S. Johnson 1998; Artigas, Glick, and Martinez 2006), in 1996 Pope John Paul II proclaimed that the theory of Darwinian evolution is so well supported by so much evidence that it has become “more than just a hypothesis.” Evolution, said the pope, is fully compatible with Christian faith and a valid explanation of the development of life on Earth, with only one major exception: the human soul. “If the human body has its origin in living material which preexists it,” the pope said, “the spiritual soul is immediately created by God” (1996).

Partially as a spinoff of the increasingly widespread celebration of Darwin Day on Charles Darwin’s birthday (February 12) (e.g., Chesworth 2002; Allmon and Grace-Kobas 2007), the Clergy Letter Project began in 2004 as “an endeavor designed to demonstrate that religion and science can be compatible and to elevate the quality of the debate of this issue.” As of February 2007 the project’s “open letter concerning religion and science” had more than 10,500 signatures. February 12, 2006, was the first Evolution Sunday in more than two hundred churches across the United States, in which ministers devoted their sermons to seeking accommodation between evolution and religion (Clergy Letter Project). “One of the goals of the Clergy Letter Project,” says its founder, Michael Zimmerman, a Wisconsin college administrator and biologist, “is to demonstrate that the choice that people are trying to foist on them is a false dichotomy. The fact that thousands of clergy are standing up and saying, ‘We are comfortable in our beliefs, in our faith, and in our God, and we are comfortable with modern science,’ is a very forceful statement” (Eisenberg 2006).

A similar grassroots effort is the Nebraska Religious Coalition for Science Education, a “network of Nebraskans from diverse religious faiths with the shared conviction that academic freedom, religious freedom, and scientific integrity are indeed compatible.” The mission of the coalition is to “proclaim the compatibility of good science (including evolution) and good theology (including creation),” and they furthermore “desire to help raise awareness, particularly in Nebraska’s religious communities, that methodological naturalism is an essential part of good science, and that the scientific search for natural explanations is not anti-religious” (Austerberry 2003).

The mainstream (and frequently politically liberal-leaning) media similarly largely embrace accommodationism. *New York Times* science writer William

Broad, for example, writes that “the truth is that science and spirituality, rather than addressing similar ground, speak to very different realms of human experience and, at least in theory, have the potential to coexist in peace, complementing rather than constantly battling each other. . . . The scientists who make sweeping metaphysical claims may represent a vocal minority. But hubris and celebrity are a potent mix, and threaten to intensify a cultural war that need not be” (Broad 2006). The “sermons” of Dennett and Dawkins “are unsatisfying,” writes another senior *Times* science writer, Cornelia Dean (2006): “Of course there is no credible scientific challenge to Darwinian evolution as an explanation for the diversity and complexity of life on earth,” she continues. “So what? The theory of evolution says nothing about the existence or nonexistence of God.” Indeed, the generally negative literary reception to Richard Dawkins’s most recent (2006) strident attack on religion (e.g., Bakewell 2006; Holt 2006; Krauss 2006; Orr 2006; Ruse 2007; but see also G. Johnson 2006b and especially Weinberg 2007) suggests that his brand of extreme secularism/materialism is not widely shared among intellectuals.

Accommodationism, however, unquestionably has significant logical problems. First of all, it is simply not always possible. It is sometimes logically impossible to hold specific religious tenets about the world *and* accept current scientific thinking on these same aspects of reality: “Although evolution does not attack religion it does pose the problem of what to do when convincing scientific conclusions come into conflict with the beliefs people hold without evidence” (Bambach 1983, p. 853). “I know it passes in polite company to let people have it both ways, and under most circumstances I wholeheartedly cooperate with this benign arrangement. But we’re seriously trying to get at the truth here” (Dennett 1995, p. 154). Furthermore, although Pennock (1999, p. 339) suggests that there is nothing about Darwinian evolution per se that rules out “notions of purpose and meaning,” such as that “our purpose in life is to praise God, to accept Jesus as our Lord and Savior, to ask for spiritual grace and . . . to ultimately fulfill our purpose in eternity,” atheists such as Provine and Dawkins would object and insist that: (1) it is absurd to praise a God that either does not exist or does nothing of consequence; (2) accepting a person who has been dead for almost two thousand years as a “Lord and Savior” is either meaningless or ridiculous; (3) “spiritual grace” has no meaning at all; and (4) the idea that anything about us besides our atoms will last into eternity is nonsense. Indeed, upon closer inspection, most attempts at accommodation seem to be able to persist only because they lack specificity and logical

consistency, and so risk being ultimately unsatisfying to someone who wants to know exactly how God interacts with the physical universe.

### *General Explanations for Accommodationism*

There either is a God or there is not, and therefore either accommodationism is a valid approach to comprehending the material universe or it isn't. Unfortunately, we will never know for sure which is true. So let me first consider why, if it is *not* valid (i.e., God does *not* exist), attempts at accommodation persist, and why most Americans maintain that it is possible to both believe in a supernatural God and accept that naturalistic science works. There would appear to be at least five general potential explanations; certainly more than one could be responsible for the expressed beliefs of a single individual.

*Poor understanding of science.* Sad though it may be to admit, a major reason that many people can uncritically amalgamate religious and scientific viewpoints may be that they just don't understand science very well (Hazen 2002; Shermer 2002; National Science Board 2006). This poor understanding allows them to believe that the science that, for example, produces the technology they employ and enjoy in their everyday lives is the result of one kind of thinking, whereas ideas such as the Big Bang or evolution by natural selection come from some other kind of much more questionable activity.

*Tolerance.* Americans have a genuine and famous propensity for tolerance and compromise, especially regarding religion. The "continuing power of the sentiment for harmony" between science and religion is deeply embedded in the American psyche and culture, and this has encouraged a wide and creative range of accommodations (Croce 1995, p. 13). Lacking a homogeneous state-sponsored religion and embracing democratic pluralism as they do, when confronted with an either/or choice, Americans tend to say about most matters, "it depends," "live and let live," or simply "both." That everyone can believe whatever he or she wants seems the essence of the religious freedom guaranteed by the Constitution and it is what most of us seem to want to be able to say.

*Hope.* One potent force behind widespread accommodationism is clearly the ubiquitous human needs to feel cared for and to have a purpose in life. These needs have long been identified as an important component of religious faith, and are often pointed to as major problems in acceptance of the completely materialistic/secularistic viewpoint. Distinguished evolutionary biologist (and former Dominican priest) Francisco Ayala, for example, describes this as a major issue for

evolutionists: “There are six billion people in the world,” he says. “If we think we are going to persuade them to live a rational life based on scientific knowledge, we are not only dreaming—it is like believing in the fairy godmother. People need to find meaning and purpose in life. I don’t think we want to take that away from them” (G. Johnson 2006a).

These very American and very human feelings also have potentially powerful political implications. Barack Obama, for example, writes in his recent personal manifesto that the political and societal success of evangelicals in the United States “points to a hunger for the product they are selling, a hunger that goes beyond any particular issue or cause.”

Each day, it seems, thousands of Americans are going about their daily rounds . . . and coming to the realization that something is missing. They are deciding that their work, their possessions, their diversions, their sheer busyness are not enough. They want a sense of purpose, a narrative arc to their lives, something that will relieve a chronic loneliness or lift them above the exhausting, relentless toll of daily life. They need an assurance that somebody out there cares about them, is listening to them—that they are not just destined to travel down a long highway toward nothingness. . . . [O]ver the long haul, I think [progressives] make a mistake when we fail to acknowledge the power of faith in the lives of the American people, and so avoid joining a serious debate about how to reconcile faith with our modern, pluralistic democracy. . . . When we abandon the field of religious discourse . . . when we discuss religion only in the negative sense of where and how it should not be practiced, rather than in the positive sense of what it tells us about our obligations toward one another; when we shy away from religious venues and religious broadcasts because we assume that we will be unwelcome—others will fill the vacuum. And those who do are likely to be those with the most insular views of faith, or who cynically use religion to justify partisan ends. (Obama 2006, pp. 202, 213–14)

*Social acceptability.* People may say that they believe things that they really do not, or aren’t sure about, because they think that affirming them is the right or socially desirable thing to do. This “social desirability” or “social acceptability” factor—the tendency to give a favorable picture of oneself—is “generally considered to be a major source of response bias in survey research” (DeMaio 1984, p. 257). For example, “people who feel that being aware of the latest media releases is highly desirable are more than twice as likely to inaccurately report having read

nonexistent books or seen nonexistent movies as people who rate such awareness as highly undesirable” (p. 271). The sources of these expectations or values influencing answers can be the person himself, the perception of the interviewer, or society as a whole. People may therefore say they believe in God, when they really do not or are undecided, because they think that this is the socially acceptable answer.

*Self-delusion.* Psychologists label as “self-delusion” the state of intentional or unintentional psychological dissociation that allows individuals to persuade themselves to believe what they know is not so, or to hold two mutually exclusive beliefs at once (Fingarette 1969; Audi 1988). Psychologists disagree, however, on exactly what causes or allows this phenomenon (see, e.g., McLaughlin and Rorty 1988; Scott-Kakures 1996; Lazar 1999; and references therein). One interpretation is that although the self-deceiver simultaneously holds two incompatible beliefs, one of the beliefs is somehow not consciously “noticed,” thus allowing the individual to avoid directly comparing two ideas and so realizing their incompatibility. In other words, we just don’t think about it very hard. This simple statement probably applies to a multitude of experiences in the daily lives of every human being. We all hold self-contradictory ideas, “if only because we cannot see far enough into the implications of each of our beliefs” (Fingarette 1969, p. 14). None of us can consciously process everything all the time or be completely consistent in our thinking. Gamblers and other risk-takers, for example, daily go against the odds in the hope of success. We all engage in wishful thinking; we “try not to think about” ideas or conclusions we find unpleasant; and, in the extreme case, we may even completely suppress things that are too painful to have in our consciousness. (See Trivers 1985 for an evolutionary explanation of self-deception.) Such self-delusion or deception is thus not unique to religious people, nor is it necessarily an undesirable characteristic.

#### *Accommodation among Scientists*

But what if God *does* exist? If scientists believe this as a starting point, they must in some way reconcile their materialistic pursuit of exclusively natural causes for physical phenomena with their acceptance of an active supernatural deity. The challenge in such reconciliation may be phrased as follows: If God actually intervenes in the lives and events of humans by supernaturally altering the behavior of matter or energy—that is, by performing miracles—with any significant frequency, how can scientists be confident that anything they are studying is not also a miracle? How can we believe in the laws of science if God can and does change

the rules? The existence of “lawful regularity” (Pennock 1999, p. 195) is central to the functioning of science, but if it is susceptible to the unpredictable intervention of the supernatural, how can science proceed? How, in other words, how can one be a “religious scientist”?

Attempts to answer this question have a long and illustrious history, including natural theology and Enlightenment deism (see, e.g., Olson 2004; Thomson 2005; Witham 2005). In the mid-twentieth century several prominent evolutionary scientists were explicit and devout Christians, including geneticists R. A. Fisher (1890–1962) and Theodosius Dobzhansky (1900–1975), and mammalian paleontologist (and Jesuit priest) Pierre Teilhard de Chardin (1881–1955). Today, accommodationist scientists include a spectrum of views, from the fringe of “creation scientists” and “intellectuals who find Darwinism unconvincing” (Dembski 2004; see analysis in Chang 2006), to serious scientists who are clearly committed to both serious science and theistic religion and who have clearly thought deeply about exactly how the natural and the supernatural can both be apprehended.

I have been doing a very informal poll of scientists and engineers at Cornell University who have publicly said they are religious, and one shared his beliefs with me:

I can do science if I believe that the thing I am studying operates according to purely mechanistic principles. I am not required to presume that all of what has happened in the universe for all time is explainable based on purely mechanistic principles. I believe in a God who performs miracles, who hears prayers and sometimes answers them miraculously, and who created the entire physical universe and all life based on principles that cannot be explained by the scientific method. At the same time, I believe that He created the universe in a way that functions according to understandable principles.

When I asked this professor how he could believe in both miracles and materialism, he said that “there is a certain level of trust” between him and God. Basically, he trusts that God will not mislead him by performing a supernatural miracle on something he is working on. He cited the Old Testament for support of this view: “In speaking to the prophet Jeremiah about the certainty of His promise to restore the Jewish people after their impending exile to Babylon, God says, ‘If I have not established my covenant with day and night and the fixed laws of heaven and earth, then I will reject the descendants of Jacob and David my servant and will not

choose one of his sons to rule over the descendants of Abraham, Isaac, and Jacob. For I will restore their fortunes and have compassion on them” (Jeremiah 33, 25–26). “Thus,” this professor said, “this passage presumes that it is obvious that God has promised to run the universe by fixed physical laws. Thus, the Christian scientist has every right to explore what those laws are.” This, he said, “puts God on record as normally not intervening with miracles.”

Another Cornell professor told me,

I believe . . . that our universe was created by God, who sustains it in being moment by moment. The patterns of material behavior that we humans observe, systematize, and call the laws of nature are merely the “customs of God.” In other words, God works through the secondary causes, which we scientists study. . . . Methodological naturalism in scientific method, however, does not preclude the possibility of miracles in history. Miracles are precluded neither by philosophical presuppositions (à la Hume) nor by science. They are rare and spiritually significant historical events, the truth of which must be evaluated on the basis of empirical evidence and the reliability of the witnesses.

Somewhat further toward the scientific end of the spectrum are a large (and growing) number of practicing scientists and scientifically trained philosophers and theologians who have recently published book-length expositions of their personal attempts to reconcile religion and science. These include Harvard astronomer Owen Gingerich (2006); physicist and theologian Ian Barbour (1990, 2000); John Polkinghorne, fellow of the Royal Society and particle physicist turned Anglican priest (1998, 2005); cell biologist and Brown professor Kenneth R. Miller (1999), who testified for the plaintiffs at the 2005 Dover ID trial; philosopher of evolution Michael Ruse (2001a), who testified for the plaintiffs in the 1981 Little Rock scientific creationism trial; paleontologists Simon Conway Morris (2003), Stephen Godfrey (Godfrey and Smith 2005), Keith B. Miller (2003), and Daryl Domning (2006); head of the Human Genome Project, Francis Collins (2006); and ecologist Joan Roughgarden (2006).

*Three paleontologists and their gods.* Three prominent paleontologists who are publicly religious but have not published their own book-length personal religious odysseys agreed to share with me their thoughts on how they reconcile their faith with their science.<sup>6</sup> The three form their own small God Spectrum, and I will consider them here in the order of the more to the less religious.

*Peter Dodson.* Peter Dodson is a leading dinosaur paleontologist, professor of both geology and veterinary anatomy at the University of Pennsylvania, and coauthor of a major college text in evolutionary biology (see E. O. Dodson and P. Dodson 1985; P. Dodson 1996). He also says he is a devout Catholic theist (P. Dodson 2004). “The idea of an inherent conflict between science and religion,” he writes, “is at best a crude caricature, and at worst an outright fraud” (2004, p. 1). “I can accept the insights of evolution by natural selection,” says Dodson, “and still have the feeling that this is not the whole story” (1999, p. 190). “The profound intuition of the religious believer,” he says, “is that life has meaning and purpose, and this intuition provides the basis for cosmic hope. . . . It is also a profound religious intuition that our existence on this planet is not a matter of chance or accident; we are not the unintended consequence of the uncaring Cosmos” (2006, pp. 25–26). Dodson believes in an ongoing creation: “God’s providential love for us is infinite, and by definition this cannot be poured out in an instant but is necessarily on-going and open-ended. Creation is not finished, stars are exploding, comets are impacting, new elements are being created, life is evolving” (1997, p. 8).

Dodson accepts the possibility of at least occasional physical interventions by God in the affairs of the material world, but holds that we will likely not be able to detect them by scientific means. “If divine intervention actually took place by altering the course of evolution by genetic manipulation, for example by non-random mutation, could it in principle be recognized?” (1999, p. 190). “If I have an experience of God, my experience is subjective and therefore inadmissible in science. If a heavenly messenger appears to me once, and my experience is not replicable on demand, this again is excluded, because science is supposed to be repeatable. . . . A religious world view subsumes a scientific view but treats human experience, including contact with the divine, with equal seriousness” (p. 191).

At least some of these interventions, for Dodson, qualify as “miracles.” He says, for example, that he accepts “the divinity of Jesus Christ, and most especially his Resurrection” (1999, p. 191)—presumably indicating that he literally believes that a flesh-and-blood human being was stone-cold dead and then came back to life via supernatural intervention by God—and he says he is open to the possibility of nonmaterial medical cures that might be of the sort the Catholic Church occasionally investigates as genuine miracles. He believes that God communicates with him personally, although not in any way he can specifically identify, leading him to know things he would not otherwise know. Although he (perhaps a bit playfully) says of his beloved dinosaurs that, “Like all of His Creation, they gave Him praise”



and that “God loved them” (1997, p. 8), he also believes that humans alone, among all species that have ever existed, have a special relationship with God: “My God did not come to save prokaryotes but to save humans” (1999, p. 189).

Nowhere in his published work does Dodson explain in any specific way what he means by terms like *cosmic hope*, *providential love*, or even *creation*. He seems to have intuitive definitions of them, in contrast to terms he uses in his science. In our interview, he said that it would never occur to him to attribute an aspect of a dinosaur skeleton he might be studying to supernatural causes, but he could not clearly explain why he was sure this would not be a potential obstacle to his scientific research. He appears to have a comfortable and largely subconscious inner filter that removes the potentially complicating possibility of supernatural intervention in his own work on dinosaurs, but allows it through in how he attributes causation in human thought and behavior—both his own and others’. When I asked him whether his feelings might be different if he was a neuroscientist rather than a paleontologist, and his day-to-day scientific work was concerned with specific questions of where thoughts, intentions, and meanings come from in the blood, electricity, and neurons of the brain, he said he did not know, but the question did not appear to bother him.

*Patricia Kelley.* Patricia Kelley is a professor of geology at the University of North Carolina at Wilmington, former president of the Paleontological Society, and a former graduate student of Stephen Jay Gould. She did some of the first important empirical tests of punctuated equilibrium (e.g., Kelley 1983, 1984), became an authority on studying predator-prey coevolution and escalation in the fossil record (e.g., Kelley and Hansen 1993, 2003), and has written and spoken frequently against creationism. She also takes great pride in being married to an ordained Presbyterian minister and in having taught Sunday school—specifically adult Bible study class—for most of the past thirty years (see chapter 9; Kelley 2000, 2009). She describes herself as a paleontologist with a deep religious commitment. She agrees that supernatural explanations act as “science stoppers” (Ruse 2001a): in other words, turning to a supernatural hypothesis when natural processes appear to provide insufficient explanations prevents further pursuit of natural explanations. But she also is very concerned that “bright young minds are being forced to choose between faith and science” (see chapter 9), so she has long sought to explain her personal accommodation of science and religion to her students.

Kelley views evolution as God’s means of creating; she thinks creation is an ongoing process spanning billions of years and that it is not over yet (see

chapter 9). She thinks that God acts through natural processes, but (similar to Dodson) says that even if God did act through supernatural processes, “we couldn’t tell it anyway.” She says, for example, that she believes in a God “who has the power to intervene in the physical world, but if such intervention occurs it would not be possible to confirm it by scientific testing.” She believes in a God who has the power to intervene in any way he wants, including via communication with human consciousness or through physical phenomena, but that hypotheses that invoke the supernatural are untestable and therefore cannot be employed in science. Such hypotheses cannot be disproved, but they are not very useful in understanding the world. She says that “prayer may result in nonmaterial changes (e.g., in human attitudes, desires, perceptions, feelings),” but does not make clear whether this is because God somehow communicates with the human who does the praying or because the act of prayer itself changes the person’s attitudes or actions. This vagueness she attributes to her inability to differentiate between the two: “a change in attitude,” she says, “could be considered the way in which God is communicating” and the attribution of this change is a matter of faith, not empirical test.

On the written questionnaire, she locates her views between B and C along the God Spectrum (figure 10.1), clarifying her belief as: “A supernatural (non-material) God designed and created the entire material Universe and has maintained and guided it through all time through natural processes that are in accord with known physical laws (e.g., quantum indeterminacy).” She rejects the occurrence of miracles in the sense of interventions by God in the physical world through alteration or suspension of physical laws, and believes that God’s interventions are accomplished literally by the action of these laws.

*Richard Bambach* is one of the leading American paleobiologists of the late twentieth century (see A. I. Miller 2004). He spent most of his career at Virginia Tech and then retired, first to Harvard and then to the Smithsonian Institution, where he is now a research associate in the National Museum of Natural History. He has been an active church member (in either the United Church of Christ or the Presbyterian Church) since his early teens. Bambach does not believe in miracles, “that ‘supernatural’ events occur,” or that “‘God’ interferes in any supernatural fashion with the universe.” He also does not believe in “a God who is personally acting” on his behalf, or that “God acts directly on day-to-day issues that people are capable of dealing with themselves.” He does, however, consider himself a “religious person,” and he believes that “there is a non-material entity that embodies the qualities and concepts [of] decency, morality, fellowship, stewardship, goodness, helpfulness, caring, [and] love.” Bambach holds that “both

tenets of religion and widely accepted scientific theories are *beliefs*” (1983, p. 851; emphasis added) and that “we need more than science” to lead a meaningful life.

His views on what that “more” might be are centered on the idea that we are unlikely to be able to understand any deity that may exist with the tools available to us as “limited mortal humans.” It is not, he thinks, reasonable to expect “complete and definitive, reproducible and documentable evidence of a physical sort” for what may be “senses or feelings or beliefs” which may “relate to some actual reality, but a reality that is veiled” because it “is immaterial in scientific terms and not fully comprehensible to us.”

Even though God is “unknowable and incomprehensible,” Bambach nevertheless recognizes God as “the ultimate essence of the range of spiritual values . . . that can inform us of the best way to maximize the quality of life for all living things, which I believe should govern human behavior.” Even clearly talking about such things may be difficult, he says, because they “may be beyond our abilities to express.” The human inability to comprehend God, Bambach suggests, might be “analogous to how placozoans, sponges, or cnidarians might (or might not) conceive of the intellectual and physical capabilities of humans.” (This is reminiscent of Darwin’s rumination in his famous 1860 letter to Asa Gray [1993, p. 224]: “With respect to the theological view of the question . . . I feel most deeply that the whole subject is too profound for the human intellect. A dog might as well speculate on the mind of Newton. Let each man hope and believe what he can.”)

Bambach’s views include some measure of trust that he will not be misled by such a God. Most Christians, he says, “believe (have faith) that God is not deceptive or cruelly intentioned” and that “studying and learning about that physical reality IS learning about what God actually did.” Accordingly, he says, “the universe I observe as a scientist IS the physical reality in which the spiritual truths and meanings that I have faith exist (and that are the root of my religious orientation) operate—or can be applied.” He too has “faith that the universe and all in it that I can observe are what should exist and that whatever supernatural entity may relate these things together is not ‘jerk[ing] me around.’”

As a way of further exploring this idea of the existence of the supernatural, Bambach says that he can “think of two things that can embody a very active concept of a supernatural entity that, in principle, could exist” and not be inconsistent with the conclusions and methods of science:

1. It is possible, he says, “that a supernatural entity created the universe and the laws of nature” in the singularity of the Big Bang, and that this

“designed system could operate to bring to fruition the creative potential formed in that system in its origins so that it would evolve as it has.” He explains that he means by this not “a directed existence leading up the ladder to man,” but rather “a system in which life could have evolved in many places and times, with some living systems occasionally evolving sentient, intelligent life forms with capabilities similar to (or even superior to) humans’. These sentient systems could begin to conceive of the supernatural entity.”

2. It is also possible, he admits with some hesitation, “that the entire universe was created by a supernatural entity just a second ago (or at whatever moment you would like, a second before you read this or a second before I wrote it, or a second before Shakespeare started writing *Hamlet*; it doesn’t matter—the principle is the same). If this were done so that everything was in place at the moment of creation, with the energy (light and other radiation) distributed in space as it is (or would have been at the moment of creation so that it would then shift to be distributed as it is now) and with all sentient organisms with the memories they have, and so forth and so on, then that universe would be absolutely indistinguishable from one that has the history we think we are unraveling through scientific study. Interestingly, although entirely supernatural in origin, such a universe would be scientifically studyable so that we could continue to advance technology, since the laws of nature . . . therefore the practice of science and engineering, would be identical to those in a universe with the natural long history we believe it has had.”

Either of these two scenarios, says Bambach, could have happened, but since they are “indistinguishable from the universe as we think it is,” they “add nothing to our scientific understanding” and so can be ignored as scientifically useless. But, he suggests, “if you want to be honest about what science can and cannot do about supernatural entities,” these two scenarios point out that science “is built on the assumption that what we see is the only story that could have happened. And that just ain’t so.” The “bottom line” says Bambach, is that “everybody has a faith” and that “none of us KNOWS what the ‘truth’ is. If we did, there would be nothing to discuss.”

*The nature of modern scientific accommodationism.* The three paleontologists with whom I talked and the recent authors of book-length expositions are all

intellectually honest persons for whom religious faith provides meaning to their lives and no threat to their science. Their views of how their science and their faith interact differ, however, on just about every other detail. Some accept physical miracles; some do not. Some think that at least some aspects of God or God's actions are scientifically knowable; some do not. Some are comfortable in institutional faiths; others are not. None have worked out what could be called a thorough, detailed, and consistent view of exactly what God is and how we (scientist or nonscientist) can know anything very detailed about it. Some say that even if they could envision—or wanted to envision—such a view, they could not find words to describe it.

There are other authors, however, who have suggested more cynical interpretations of these accommodationist views. One reason might be that such books sell: “Publishers have come to learn that there is a lot of money in God,” says Neil Degrasse Tyson, “especially when the author is a scientist and when the book title includes a direct juxtaposition of scientific and religious themes” (Tyson 2001). Will Provine has suggested that accommodationist scientists are driven by a mixture of unconscious pragmatism and outright intellectual dishonesty: “In the United States, elected members of Congress all proclaim to be religious; many scientists [therefore] believe that funding for science might suffer if the atheistic implications of modern science were widely understood” (Provine 1987, p. 52). He later expanded this suggestion:

I suspect there is a lot of intellectual dishonesty on this issue. Consider the following fantasy: the National Academy of Sciences publishes a position paper on science and religion stating that modern science leads directly to atheism. What would happen to its funding? To any federal funding of science? Every member of the Congress of the United States of America, even the two current members who are unaffiliated with any organized religion, profess[es] to be deeply religious. I suspect that scientific leaders tread very warily on the issue of the religious implications of science for fear of jeopardizing the funding for scientific research. And I think that many scientists feel some sympathy with the need for moral education and recognize the role that religion plays in this endeavor. These rationalizations are politic but intellectually dishonest. (Provine 1988b, p. 69)

It is possible that the scientists seeking accommodation between their science and their religion are victims (or perpetrators) of one of these (or other) factors—poor understanding of science, inordinate tolerance, hope/wishful thinking, social

acceptability bias, self-delusion, popularity, cynical pragmatism, or intellectual dishonesty—that render accommodationism a fool’s errand. In other words, it is possible that they all are misled. Certainly this is the interpretation that critics of accommodationism, such as Dawkins, Dennett, and Provine, favor. It is also possible that these accommodationist scientists are struggling toward a truth that is still only poorly defined and certainly difficult to comprehend.

Which is it? As far as scientists are concerned, is there a God or isn’t there? How do we figure this out? How do we know if we can? Are attempts to seek accommodation between religion and science legitimate or foolish?

What scientists accept as true about the natural world is not decided by a vote of opinions; it is supposed to be decided by agreement with observation about nature. In practice, however, what is accepted as true in a particular area by the overall scientific community at any given moment is usually the majority view among those scientists who are specialists in that area. If most specialists who have devoted years to researching a topic accept a particular theory, it is usually treated as true by nonspecialists who have not studied it in as great detail; it is what “most experts say.” If a view accepted by a majority of specialists is challenged by new information or interpretations, it will generally not be discarded—nor the new view accepted—until enough contrary theory or examples have been put forward to convince a majority of specialists to change their minds. If this doesn’t happen, the old theory stands. If there is no clear majority view, then textbooks and “received wisdom” will normally report that the topic or question at issue is “poorly understood” or “controversial.”

By this standard, the “scientific status” of accommodationism can be labeled only as unclear. It is not the majority hypothesis of “leading” evolutionary biologists (e.g., members of the NAS), yet it may well be widely accepted by the much larger group of “ordinary” evolutionists and other scientists. Whoever or however many scientists accept it, it certainly cannot fairly be called a single, well-developed, or coherent idea. Indeed, it is entirely possible that the majority of its adherents—even the ones who have thought a great deal about it—cannot articulate it clearly at all. Taking the variety of views about accommodation at face value suggests similarity to a field of science just prior to a paradigm-shifting “revolution” (Kuhn 1970). By the standards by which any other major idea in science—such as plate tectonics, atomic theory, relativity, or natural selection—is normally assessed, the nature or existence of God is thus anything but decided. This, to me, means two things: first, that it is incorrect to state that a consensus exists one way or the other and, second, that ample opportunities exist for new ideas and new interpretations.

### *The God of Accommodation*

If accommodation between religion and science is possible (i.e., God does exist), what is the nature of the God with which such religion would concern itself? Accommodationists—scientists and nonscientists alike—are looking for the existence of an “interested” God, not an abstract or impersonal one (Weinberg 1993 p. 245; Haught 2006, p. 697). Accommodationists, in other words, are “looking to science for something far more specific—the constant, hovering presence of the kind of God described in Sunday school, who watches over us and answers our prayers. This is not the God of deism, who cranked up the universe and let it run” (G. Johnson 2005).

The serious scientists who are trying to accommodate their religion and their science appear to be focusing on three different approaches to finding this “interested” God. These three approaches are usually, but not always, clearly distinguished.

1. God does (or did) perform physical miracles which are outside the realm of normal physical laws, but extremely rarely and only under the most exceptional of circumstances, and so such supernatural interventions can be safely discounted as complicating factors in doing normal science.
2. God acts via existing physical laws and processes, in ways that are specifiable but probably undetectable. For example, Kenneth R. Miller eventually concludes his lengthy discussion of why religion and evolution are compatible with the conclusion that God probably acts through quantum indeterminacy. This idea has been considered favorably by some (Russell 1998, 2006) and criticized by others (Ruse 2001a).
3. God acts via a set of processes that are neither physically specifiable nor detectable, and that are completely beyond the physical reality that is the purview of science and accessible only to the tools of faith. Such a God actively upholds the universe in a way we have not discovered and will not ever discover. And this God communicates with human beings.

In exploring this third approach, both ontology and language are significant problems. Science deals in concrete physical ideas such as observation, hypothesis, and theory, whereas religion (especially Christianity) is often said to deal with much different kinds of concepts, expressed in phrases like “the eternal divine mystery” (Haught 2006, p. 698). For example, statements such as the following are common among theologians, but make no sense at all in a scientific context:

“a humble, kenotic, self-emptying God . . . undergoes a *kenosis* (that is, a pouring out) of the divine substance . . . manifested in the obedience and self-sacrifice of Christ. . . . [As John Paul states, the *kenosis* is] ‘a grand and mysterious truth for the human mind, which finds it inconceivable that suffering and death can express a love which gives itself and seeks nothing in return’” (Haught 2006, p. 699).

God is to be thought of as one who not only creates, but also makes and faithfully keeps promises, inviting (even commanding) people to hope. This God opens up the future even where there appear to be only dead ends. The opening of the future, however, is not to be thought of as an ad hoc, interventionist, readjustment of the laws of nature. Rather, it is a constant aspect of the way God relates to the world. God, therefore, may rightly be called the “power of the future.” . . . [T]he revelatory image associated with the picture of Jesus as the manifestation of God is one in which the divine mystery gives itself away to the creation in humble and selfless love. (Haught 2006, p. 704)

Can such religious ideas and language be put into any kind of scientifically recognizable framework (even if not scientifically studyable)? I believe that they can.

What if this concept of “mystery” actually refers, not to some vague and fuzzy sense of an all-powerful but benign force in the universe, but to an actual separate reality, outside the rules and reach of scientific materialistic rational investigation? What if there really is a God, but this God exists and functions in ways that are literally undetectable to science because they function in some parallel realm that interacts with our material universe only in nonmaterial ways? Specifically, such a God might not physically intervene in the material world, either by changing or suspending physical laws, but might communicate with people through their dreams or thoughts, not by physically rearranging neuronal signals but in some other way that we cannot and will not discover by physical investigation. Such a God might therefore be said to “answer prayers,” perhaps along the lines of the statement attributed to Unitarian minister Lon Ray Call (1894–1985): “Prayer does not change things; it changes people; and people change things.” Humans may be special in the eyes of such a God, but our special qualities, whatever they are, will remain undetectable by any techniques of material science. Perhaps such a God is knowable in some way analogous to science, via the techniques of prayer, meditation, or systematic theology. Perhaps not.

Extreme atheists might argue that such a God is either meaningless or just more wishful theological thinking. Provine, for example, says that “a widespread theo-



logical view now exists saying that God started off the world, props it up and works through laws of nature, very subtly, so subtly that its action is undetectable. But that kind of God is effectively no different to my mind than atheism . . . [because] this kind of God does nothing outside of the laws of nature, gives us no immortality, no foundation for morals, or any of the things that we want from a God and from religion” (1988b, p. 70). But if such a God did communicate with and influence humans in some undetectable but significant way, then such a God might affect morals, ethics, and behavior, and so might matter a lot.

As noted by Pennock (1999, p. 335), the idea that an omnipotent, supernatural God could physically intervene at any or all points in the process, and do so in a way that we could never discover scientifically, is an old one. It has its extreme versions, such as “the appearance of age” creationist view, and its less extreme versions, such as God creating the genetic variations upon which natural selection works, but in so subtle a manner that they appear random to us, or God working through quantum indeterminacy (K. R. Miller 1999). All of these conceptions, however, have God working through the existing physical laws and processes. It thus remains possible that naturalistic science could someday discover a way to detect these effects, and they would then no longer be supernatural. If, however, God actually exists, but does so at a completely nonphysical level, then that God is truly consistent with physical naturalistic science.

This conception of God is similar to that of ontological naturalists such as Thomas Hobbes and Baruch Spinoza, who allowed for the existence of God “provided God’s attributes are appropriately constrained to conform to the regimen of the given natural ontology” (Pennock 1999, p. 190). It is also similar to the concept of God implied by at least some of the official doctrine of the Roman Catholic Church, which maintains that “according to the Catholic understanding of divine causality, true contingency in the created order is not incompatible with a purposeful divine providence. Divine causality and created causality radically differ in kind and not only in degree. Thus, even the outcome of a truly contingent natural process can nonetheless fall within God’s providential plan for creation” (International Theological Commission 2004). Such a God, of course, is a literal “other” as far as the scientific approach to the world is concerned, and so is likely to be extremely difficult for scientists to seriously consider:

There is no way . . . to understand this paradoxical divine mode of creativity by looking for clear analogies in the thought-world of science with its emphasis on efficient causation. Therefore, attempts to render divine action

intelligible on the analogy of efficient causation or of what passes as causal in the natural sciences will, in my opinion, end up diminishing or obscuring the multifaceted way of influencing the world that theology must attribute to God. For that reason, theology must not apologize for its perpetual failure to arrive at complete intellectual clarity with respect to divine action and divine providence. Theology does not do justice to the power of divine action unless it employs a variety of images that cannot be smoothly mapped onto one another. . . . Theology must avoid exclusive fixation on any of the metaphors it uses. . . . Theology need not be embarrassed that its subject-matter, especially the religious sense of divine action, must always be approached by a tentative and dialectical discourse that constantly allows itself to be relativized by appeal to a rich variety of symbols, analogies, and metaphors. It is a mark of eminence, not the absence, of the divine that we need to clothe our fragile and finite words about it in a rich plurality of references. (Haught 2006, p. 704)

God does not have to become one actor among others in the cosmic and evolutionary story in order to be profoundly effective. Rather, divine action with respect to evolution and cosmic process is to ground and sustain the narrative loom upon which an indeterminate and still unfinished cosmic drama may be woven. . . . God's grounding and sustaining of the narrative structure of natural being is a much deeper kind of involvement in the world than could ever be the case if divine action consisted essentially of engineering things in the immediate manner that evolutionary materialists, creationists, and intelligent design advocates consider most appropriate to a masterful God. (Haught 2006, p. 707)

God may simply not be understandable at all:

For my thoughts are not your thoughts, neither  
are your ways my ways, saith the Lord.  
For as the heavens are higher than the earth, so  
are my ways higher than your ways and my  
thoughts higher than your thoughts.

(ISAIAH 55:8–9)

This is not a “God of the gaps” that acts only in those areas of temporary scientific ignorance (Bonhoeffer 1972; Ruse 2001a, p. 122), and so is susceptible to shrinkage with expanding scientific knowledge. This is a “real,” personal, mean-

ingful God. And whether or not we personally believe such a God actually exists, this explication means that evolutionists or geologists could honestly describe such a God as not inconsistent with the methods and findings of science; indeed, one might even be able to say that such a concept represents as much as science can say about what God is.

Paleontologist George Gaylord Simpson suggested a similar concept of God in his autobiography, in a chapter entitled “God and I”:

Much has been explained and much more is certainly explicable in terms of the material characteristics or properties of the universe. That does not explain how it happens that the universe has those characteristics or properties, how, indeed, it happens that the universe exists. I, at least, cannot even imagine any possible facts, any conceivable observations that would lead toward such an explanation. That Mysterious Ultimate is, then, inaccessible to scientific, which is to say to rational, human investigation. As far as I am concerned, it is God, or better, god. This god is in full literality ineffable, which means incapable of being expressed, unutterable, indescribable. (1978, p. 29)

I am not saying that I believe such a “nonmaterial God” actually does exist. (Personally, I have no evidence for it and so cannot say one way or the other, although I find such a concept unnecessary to understand the world and hence unlikely.) Nor am I suggesting that atheistic or agnostic scientists should or will accept that it does. I am saying only that such a God *could* exist, and could “answer prayers” and “intervene” in the world in meaningful ways, without interfering in or conflicting with how science goes about understanding the physical universe.

Such a God would clearly not be acceptable to many religious people, especially those who insist on a deity who does intervene at a material level, that is, who causes miracles. Acceptance of a nonmaterial God would inevitably require considerable adjustment on the part of individuals who believe in, for example, the virgin birth and the physical resurrection of Jesus, or the physical intervention of Allah in daily physical events. Yet it is a God that could significantly affect the lives of human beings.

## POLITICS, PEDAGOGY, AND REALITY: A SUGGESTED WAY FORWARD

For those who teach about historical geology and evolution, I believe that the previous discussion allows us to reach four important conclusions:

1. *It is bad politics, bad marketing, and simply incorrect to say, “It’s either Darwin or God, not both.”* It all depends on what one means by “God.” The term and concept can have many meanings, and not all of them can be falsified by science. There also *are* many smart, practicing scientists who say they “believe in God,” so clearly it is not impossible or irrational to do so. Furthermore, it is simple sociopolitical realism and good pedagogy to attempt to appeal to people from where they are. Telling the average class of American college students that they can have either God or evolution—when the majority of them are probably religious to a greater or lesser degree, and we as scientists are not ourselves speaking with one voice on the subject—is not being completely honest, and it is surely politically foolish. As Peter Dodson puts it, “When forced by scientists to choose between a religion that enriches human experience and an evolutionary science that ignores human experience and minimizes humans as a species, people will unhesitatingly choose the religion that gives meaning to their daily struggles” (1999, p. 192). Barack Obama makes exactly the same point in a political context: “To begin with, it’s bad politics [to avoid or denigrate religion]. There are a whole lot of religious people in America, including the majority of Democrats” (Obama 2006, p. 214).

Atheistic critics of accommodation (e.g., Dawkins 2006; Harris 2006; Hitchens 2007) have little patience for this argument; they think it is hypocritical, misleading, and intellectually spineless and irresponsible. Despite suggestions to the contrary (e.g., Nielsen 1993; Stenger 2007), however, science cannot disprove the existence of the supernatural. We simply have not proved the nonexistence of all Gods, nor disproved the existence of all meaningful supernatural God-like phenomena. This being the case, evolutionists should not allow these extremists—however amusing, popular, or articulate they may be—to speak for all of us (Ruse 2007).

2. *The politically correct, “Let’s all get along” view isn’t defensible.* Some conceptions of God are simply not compatible or accommodatable with modern science, and that may include the conceptions of many Americans. Those religious traditions that require belief in specific statements about the material world that science has clearly falsified (or at least rendered extremely unlikely) are not consistent with science, and it is

irresponsible to say or imply that they are, or to duck the subject entirely, allowing students to think that they are. Such statements include (but are not limited to) that the Earth is six thousand years old; that all species of organisms were created as we see them today and did not descend from other species; that humans are not descended from other nonhuman species of primates; that evolution has been guided by a supernatural purpose or force, outside of the nature of organisms themselves or their environments. Those who accept any of these ideas as true or reliable statements about the way the material world works are not following the rules of science, not thinking scientifically, and not really understanding or using science at all. Every teacher has as much obligation to refute these statements as to assume that students will accept that matter is made of atoms, that the continents move, and that the Earth goes around the sun. (I would also say that every intelligent layperson reading this has a personal obligation to reach a similar conclusion in the interest of intellectual consistency.)

Furthermore, it seems to me extremely difficult (and perhaps especially problematic for some self-professed religious scientists) to accept a scientific view that allows physical miracles, of any sort, ever, because there is no nonarbitrary criterion for deciding when such supernatural interventions are allowable and when they are not. Such a lack of internal consistency means that some (but not all) attempts to reconcile and accommodate traditional religions, especially Christianity, with modern science are probably not intellectually valid.

3. *Most scientists have not articulated their own personal views.* They consequently find it very difficult to explain those views when asked (as most of us are). Evolutionary biologists and historical geologists should, therefore, as a matter of professional preparation, articulate their own personal theological view, and be ready and willing to explain it, with as much clarity as they can explain natural selection, to students or anyone else who asks. Some of my colleagues may object that this is “too personal” but I simply don’t think we have that luxury. We should all write out our own versions of “This I believe” (Allison et al. 2006). It may well be, as previously discussed, that we as humans lack the investigatory and/or explanatory tools to fully explain what we think we know, but we should try our best anyway.

4. *There is always the possibility of things existing that we don't know about,* but this is not the same as telling science students that they can just accept any old thing they want. Consistency is important; without it science cannot function. But, as Emerson (1841) memorably noted, “a foolish consistency is the hobgoblin of little minds.” Modern materialistic science is *a* way of knowing about the world (J. A. Moore 1993), not the only way. As discussed above, there *are* rational hypotheses of the supernatural (which could be referred to as God) that are compatible with modern science in that they exclude physical miracles and call on a separate existence that is not, and never will be, accessible to the methods of science. One need not accept (or believe) these hypotheses (I personally do not) to state honestly that they exist—that is, that they *are* logically possible, that they are intellectually consistent, and that they fulfill many (although certainly not all) of the requirements that many religious people have for a “meaningful” God. An essential part of such concepts is that existence may be more than the material universe that is accessible to science. Science must minimize its arrogance and insistence that the material world is all there is if we are to convince nonscientists that we deserve their respect, understanding, and support.

## CONCLUDING THOUGHTS

The relationship between science and religion is a difficult topic for many reasons, including that its investigation requires scientists to be self-reflective, which is not easy for many of us. A secular scientist who read an earlier draft of this chapter commented that the four conclusions previously listed are “painfully self-evident.” Perhaps they are, but probably only to someone who thinks frequently and deeply about the relationship between science and religion. My experience, however, is that most scientists don't, and that if these conclusions *were* self-evident more scientists would publicly state them. A religious scientist found the same draft “way too sympathetic to the Dawkins/Dennett camp” and suggested that I had made religious scientists out to be “some kind of three-headed monsters that can't be understood by normal people,” instead of “persons for whom faith provides meaning” to their lives and no threat to their science. An atheist reader, on the other hand, thought I was much too easy on the religious scientists I talked to and did not press them hard enough to explain the apparent contradictions in their beliefs. These and other comments suggest that I have succeeded in at least sight-

ing, if not reaching, the middle ground where I think a more adequate approach to this topic must lie.

Why is it worth the trouble for scientists to wrestle with such a thorny debate, when we have so many other issues on our daily research and teaching agendas? Why can't we just have both religion and science, let everyone believe what they want, and leave it at that?

It is easy to fall into hyperbole in such an emotional issue, but it is hard to avoid the conclusion that the stakes here are *very* high. Intellectually, evolution is *the* fundamental idea of modern biology. Essentially every field of biology is to a greater or lesser degree based on it. But evolution is about far more than biology. Evolution is also central to many areas of the Earth sciences, and the assumptions and conclusions from other areas of science that underlie evolution—such as the great age of the universe, the solar system, and the Earth; the continuity of past and present processes; and the constancy of physical law in time and space—are shared with other fields of science, such as astronomy, physics, and chemistry. Every major organization of professional scientists in the United States has endorsed the teaching of evolution. Darwinism—evolution driven mainly (but not exclusively) by natural selection—has been the dominant causal hypothesis among biologists for evolution for more than half a century and among the most successful ideas in all of science in its ability to predict and explain observations. Even its scientific critics (e.g., Gould 2002) do not reject its fundamental aspects or evidentiary basis.

Thus, if Darwinian evolution is not valid, then there are likely serious problems with the way we think about science, and with many—perhaps all—other scientific ideas that were generated with the same methods and in which we have equal confidence. Since science has obviously allowed us to achieve an enormous amount of understanding and control of ourselves and our environment over the past four hundred years, this big a mistake would appear to call into question the very nature of our ability to reason in the world.

Broad understanding of evolution is therefore vital to the future of science in society. Clearly, however, the way scientists and educators have been approaching building that understanding is not working. Religion certainly is not the only reason for this failure, but it is surely a major part of the problem. We need a different, or at least an additional, approach to reconciling religion and science, because if left alone, the current controversy between them in the United States threatens to undo much of the social compact that has allowed American science to accomplish so much. The challenge to evolution is just one piece of a wider

social/political assault on objective science (e.g., Mooney 2005; Taverne 2005) and, as Kenneth R. Miller has put it, “American science will face a peril of the first order if it fails to understand and to respond effectively to this challenge” (2005, p. 13). It is simply not acceptable for professional scientists to hide in their labs and offices and hope that those we perceive as crazies will go away. They won’t. As Michael Ruse says, “If we do not like what the churches are feeding people, we had better come up with an attractive alternative” (2007, p. 38), and this means starting from the viewpoint of where the majority of people are. “For most Americans,” as Kenneth Miller notes, “‘What about God?’ is indeed the most important question” (2005, p. 14).

More broadly, we live in a time of both ubiquitous technological and scientific influence and surging religious fundamentalism, in the United States and abroad. Science and technology are major drivers of the modern global economy, and many of the major challenges—environmental, medical, agricultural—that confront modern society will require scientific and technological solutions in the very near future. Yet the status and future of science education, and even science itself, in the United States and elsewhere, are dangerously uncertain. Fundamentalist religious challenges to science are not only coming from Christians; other fundamentalist faiths, especially Islam, appear increasingly opposed to modern science in general, and to evolution and its associated fields in particular (e.g., Edis 2003; Guiderdoni 2003; Nasr 2006; Weinberg 2007).

The relationship of science and religion is thus not a topic that should be limited to sermons or philosophy classes or books for relatively narrow audiences (such as this one). It should be everywhere, because it is perhaps the single most important problem facing humanity today.

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## NOTES

1. I mean this choice of word to be neutral and not at all pejorative. It has been used in a similar sense by, among others, Hooykaas (1972) and Conser (1993). Other possible alternatives include *compatibilist*, *engagement*, *connectivist*, *harmonist*, *conciliationist*, *theistically scientific*, and *theistically evolutionary*.
2. The relationship of Judaism, Christianity, and Islam to science in general, and their reaction to evolution in particular, have varied. Much of what their reactions have had in common, however, relates to their sharing at least the basic aspects encompassed in this definition. In the remainder of this essay, largely for reasons of space, my comments will refer mostly to Christianity, and mainly in the United States, but this does not imply that they do not apply to Judaism or Islam.
3. The 2006 Harris poll also states that “while most U.S. adults believe in God, only 58 percent are ‘absolutely certain.’”
4. The 1998 Harris poll and the 2000 *Newsweek* poll also state that a large majority of people believe they will go to heaven, and only one in fifty thinks he or she will go to hell.
5. In trying to answer Clarence Darrow’s questioning about the divine inspiration of the Bible, Bryan testified that the Bible “was inspired by the Almighty, and He may have used language that could be understood at that time” (Scopes 1925, p. 286).
6. I interviewed Peter Dodson on May 25, 2006, and received written responses to questions from him on January 19, 2007. I received written responses to questions from Patricia Kelley on January 21, 2007. I interviewed Richard Bambach on October 21, 2006, and received written responses to questions from him on January 28 and 30 and February 4, 2007. Unless otherwise noted, all quotations and paraphrases are taken from these personal communications.

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