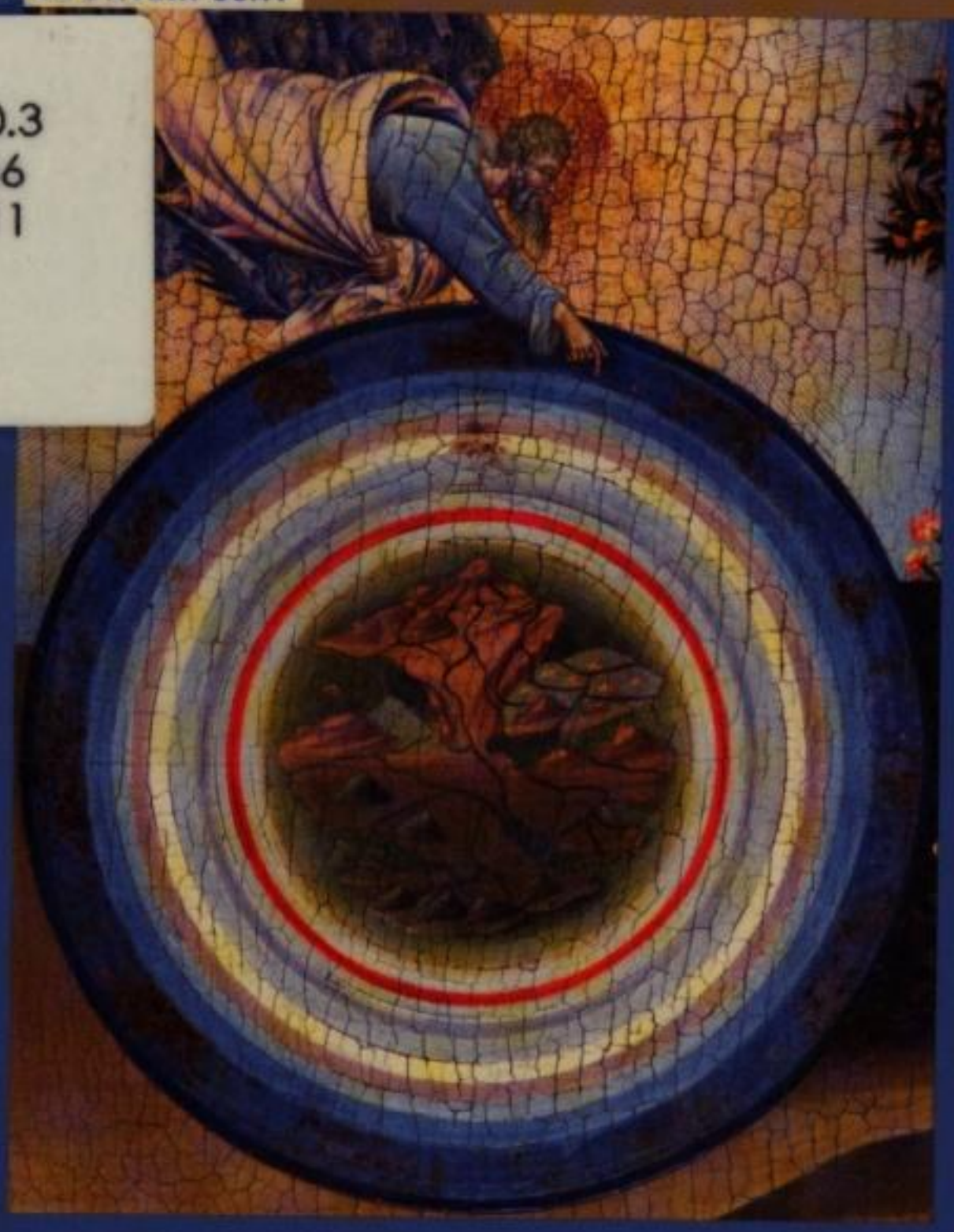
POINT COUNTERPOINT



Science and Religion

Are They Compatible?

Daniel C. Dennett Alvin Plantinga

OXFORD

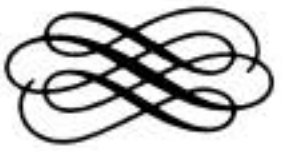
POINT COUNTERPOINT

I

Science and Religion

Where the Conflict Really Lies

Alvin Plantinga



Our question: Are science and religion compatible? A useful project would be to try to make the question more precise: What is religion? What is science? What is incompatibility, and what varieties does it come in (explicit contradiction, implicit contradiction, contradiction in the presence of plausible assumptions, improbability of their conjunction)? Some claim that theism is itself inconsistent, in which case, naturally enough, it will be incompatible with science (and everything else). Others retort that the same

goes for science: Current general relativity is incompatible with current quantum theory, so that current science itself is inconsistent, in which case it is incompatible with religion (and everything else). These are good topics, but they'll have to wait for another occasion; here I'll assume that we have at least a rough grasp of the question. I won't be talking about religion generally, but about specifically theistic religion, in particular Christian belief; and when I speak of Christian belief, I'm thinking of C. S. Lewis's "mere Christianity," something like the intersection of the great Christian creeds. Although what I say is explicitly concerned with Christian belief, it will also be relevant to many versions of Judaism and Islam.

Why think there is conflict here? Many suggestions have been offered. Theistic religion endorses special divine action in the world—miracles, for example—but such action would contravene the laws promulgated by science. There is such a thing as the scientific worldview, and it is incompatible with theistic religion. Christian belief implies that human beings have been created in God's image, but contemporary evolutionary theory, properly understood, implies that neither God nor anyone else has designed, planned, or intended that human beings come to be. Evolutionary psychology is full of theories incompatible with theistic understandings of human beings. Some scientific historical Biblical scholarship argues that historical claims of Christianity, for example, that Jesus rose from the dead, are false or anyway groundless. These are all of great interest, but I'll limit myself, in this talk, to a cluster of issues having to do with evolution. I'll argue that (1) contemporary evolutionary theory is not incompatible with theistic belief; (2) the main anti-theistic arguments involving evolution together with other premises also fail; (3) even if current science,

evolutionary or otherwise, were incompatible with theistic belief, it wouldn't follow that theistic belief is irrational or unwarranted or in any other kind of trouble; and finally, (4) naturalism, the thought that there is no such thing as the God of theistic religion or anything like him, is an essential element in the naturalistic worldview, which is a sort of quasi-religion in the sense that it plays some of the most important roles of religion; the naturalistic worldview is in fact incompatible with evolution. Hence there is a science–religion (or science–quasi-religion) conflict, all right, but it is a conflict between naturalism and science, not theistic religion and science.

I. Contemporary Evolutionary Theory Is Compatible with Theistic Belief

The term *evolution* covers a variety of theses: (1) the ancient earth thesis; (2) the thesis of descent with modification, that is, the thought that the enormous diversity of the contemporary living world has come about by way of offspring differing, ordinarily in small and subtle ways, from their parents; and (3) the common ancestry thesis: the claim that, as Gould put it, there is a "tree of evolutionary descent linking all organisms by ties of genealogy."[1] I'll use the term *evolution* to refer to the conjunction of these three. There is also (4) the claim that the principle mechanism driving this process of descent with modification is natural selection winnowing random genetic mutation. Since a similar proposal was characteristic of Darwin ("Natural selection has been the main but not exclusive means of modification"), call this thesis Darwinism. It's clear, I think, that there is no conflict between theistic religion and the ancient earth thesis, or the descent with modification thesis, or the

common ancestry thesis. According to theistic belief, God has created the living world; but of course he could have done so in many different ways, and in particular in ways compatible with those theses. What about the fourth thesis, Darwinism? Is *it* incompatible with theistic religion?

Many apparently think so: Among them are Richard Dawkins, Daniel Dennett, George Gaylord Simpson, and many others, and far to the other side, Philip Johnson. But are they right? Where, exactly, would the incompatibility arise? A suggested source of conflict has to do with the Christian doctrine of creation, in particular the claim that God has created human beings *in his image*. This requires that God *intended* to create creatures of a certain kind and *planned that there be* creatures of that kind—rational creatures with a moral sense and the capacity to know and love him—and then acted in such a way as to accomplish this intention. This claim is clearly consistent with evolution, as conservative Christian theologians have pointed out as far back as 1871.[2] But is it also consistent with Darwinism? It looks as if it is. God could have caused the right mutations to arise at the right time, he could have preserved populations from perils of various sorts, and so on; in this way, by orchestrating the course of evolution, he could have ensured that there come to be creatures of the kind he intends.

What is *not* consistent with Christian belief, however, is the claim that evolution and Darwinism are *unguided*—where I'll take that to include *being unplanned and unintended*. What is not consistent with Christian belief is the claim that no personal agent, not even God, has guided, planned, intended, directed, orchestrated, or shaped this whole process. Yet precisely this claim is made by a large number of contemporary scientists and philosophers

who write on this topic. There is a veritable choir of extremely distinguished experts insisting that this process is unguided, and indeed insisting that it is a part of contemporary evolutionary theory to assert that it is unguided, so that evolutionary theory as such is incompatible with Christian belief. According to George Gaylord Simpson, for example, "Man [and no doubt woman as well] is the result of a purposeless and natural process that did not have him in mind."[3] In this connection the late Stephen J. Gould and others have emphasized what they take to be the chancy, contingent, and undirected character of evolution; if the evolutionary tape were to be rewound and then let go forward again, the chances are we'd get creatures of very different sorts from the ones actually present on earth. The chances are we'd get nothing much like *Homo sapiens*. But Gould's suggestion *presupposes* that God has not guided and orchestrated the course of evolution, and hence can't be appealed to as a reason for supposing that he has not done so. Given the biological evidence and the proposition that God has indeed created human beings in his image, Gould's suggestion is wholly implausible; for if the tape were rewound and let go forward again, no doubt God would still have intended that there be creatures created in his image, and would still have seen to it that there be such creatures.

What about the fact that the relevant genetic mutations are said to be *random?* You might wonder whether genetic mutations could be both random and intended and caused by God: If these mutations are random, aren't they just a matter of chance, blind chance? But it is no part of current evolutionary theory to say that these mutations are random in a sense implying that they are uncaused (they are said to be caused by cosmic rays, for example); still less that they

occur just by chance. According to Ernst Mayr, the dean of post–World War II biology, "When it is said that mutation or variation is random, the statement simply means that there is no correlation between the production of new genotypes and the adaptational needs of an organism in the given environment."[4] Elliott Sober puts the point a bit more carefully: "There is no *physical mechanism* (either inside organisms or outside of them) that detects which mutations would be beneficial and causes those mutations to occur."[5] The point is that a mutation accruing to an organism is random just if neither the organism nor its environment contains a mechanism or process or organ that causes adaptive mutations to occur. But clearly a mutation could be both random in that sense and also intended and indeed caused by God.

Hence the randomness involved in Darwinism does not imply that the process is not divinely guided. The fact, if it is a fact, that human beings have come to be by way of natural selection operating on random genetic mutation is not at all incompatible with their having been designed by God and created in his image. Therefore Darwinism is perfectly compatible with God's guiding, orchestrating, and overseeing the whole process. Indeed, it is perfectly compatible with that idea that God *causes* the random genetic mutations that are winnowed by natural selection. Those who claim that evolution shows that humankind and other living things have not been designed apparently confuse a naturalistic gloss on the scientific theory with the theory itself. The claim that evolution demonstrates that human beings and other living creatures have not, contrary to appearances, been designed, is not part of or a consequence of the scientific theory as such, but a metaphysical or theological add-on.[6] Naturalism implies, of course, that we human

beings have not been designed and created in God's image (because it implies that there is no God); but evolutionary science by itself does not carry this implication. Naturalism and evolutionary theory *together* imply the denial of divine design, but evolutionary theory *by itself* doesn't have that implication. It is only evolutionary science *combined with naturalism* that implies this denial. Since naturalism all by itself has this implication, it is no surprise that when you conjoin it with science or, as far as that goes, anything else—the complete works of William McGonagall or the *Farmer's Almanac,* or the Apostle's Creed—the conjunction will also have this implication.

II. Broader Anti-theistic Arguments from Evolution

Darwinism as such doesn't include or imply the proposition that the process is unguided; what about broader anti-theistic arguments involving evolution? I'm aware of three sorts of arguments proposed here. First, there is the claim that evolution undercuts the argument from design, thus reducing the rational support, if any, enjoyed by theism. Second, there is the suggestion that the process of evolution, so wasteful and productive of suffering, is not the sort of process God would use or permit. And third, there is the thought that unguided evolution, as a hypothesis, is superior to the hypothesis that the process of evolution has been guided or orchestrated by mind, divine or otherwise, because it is simpler and more Ockhamistic. None of these objections, I believe, is promising. While I can't deal properly with any or all of them in the time allotted to me, I'll briefly outline a response to each.

by Thomas Aquinas.[18] If so, the warrant for theistic belief doesn't depend on the state of current science. Indeed, what Christians and other theists should think of current science can quite properly depend, in part, on theology. For example, science has not spoken with a single voice about the question of whether the universe has a beginning: First the idea was that it did, but then the steady state theory triumphed, but then Big Bang cosmology achieved ascendancy, but now there are straws in the wind suggesting a reversion to the thought that the universe is without a beginning. The sensible Christian believer is not obliged to trim her sails to the current scientific breeze on this topic, revising her belief on the topic every time science changes its mind; if the most satisfactory Christian (or theistic) theology endorses the idea that the universe did indeed have a beginning (isn't eternal), the believer has a perfect right to accept that thought. If so, then even if there were scientific evidence against theism, and no propositional evidence, scientific or otherwise, in favor of it, it might still be both rational and warranted.

III. Naturalism vs. Evolution

Naturalism comes in more than one variety. Here, as I said, I take it to be the view that there is no such person as the God of theistic religion nor anything like God. So taken, naturalism is not a religion. Nevertheless it is a crucial part of the naturalistic worldview, which in turn plays at least one of the most important roles of a religion. This worldview functions as a sort of myth, in a technical sense of that term: It offers a way of interpreting ourselves to ourselves, a way of understanding our origin and significance at the deep level of religion. It tells us where we come from,

what our prospects are, what our place in the universe is, whether there is life after death, and the like. We could therefore say that it is a "quasi-religion." What I propose to argue next is that naturalism and current science are incompatible, so that there is a religion (or quasi-religion) conflict, sure enough, but it is between science and naturalism, not science and theistic religion. What I'll argue is that naturalism is incompatible with evolution, in the sense that one can't rationally accept them both. Since I've given this argument elsewhere, here I can be brief.

First, note that naturalists are all or nearly all materialists about human persons; a human person is a material object through and through, with no immaterial self or soul or subject. For present purposes, therefore, I'll assimilate materialism to naturalism. The central premises of the argument are as follows. Where N is naturalism, E is current evolutionary theory and R is the proposition that our cognitive faculties are reliable,

1. P(R/N&E) is low.[19]
2. One who accepts N&E and also sees that 1 is true has a defeater for R.
3. This defeater can't be defeated.
4. One who has a defeater for R has a defeater for any belief she takes to be produced by her cognitive faculties, including N&E.

Therefore

5. N&E is self-defeating and can't rationally be accepted.

These premises need defense, perhaps the first one in particular. So suppose there are beliefs; this isn't essential to the argument for premise 1, but it will facilitate brief statement of it. From the point of view of materialism, a

belief will presumably be an event or structure in the nervous system, perhaps in the brain. It will be a structure involving many neurons connected in various ways. This structure will respond to input from other such structures, from sense organs, and the like; it may also send signals along effector nerves to muscles and glands, thereby causing behavior. Such a structure will have at least two kinds of properties: On the one hand, it will have neurophysiological properties (NP properties) specifying, for example, the number of neurons involved in the structure, the rate of fire in various parts of it, the change in rate of fire in one part in response to change of rate of fire in another, the way in which it is connected with other structures and with muscles, and so on. But if it is a *belief,* it will also have a property of a quite different sort, a mental property: It will have a content; it will be the belief that *p,* for some proposition *p.*

NP properties are physical properties; ***having such and such a content*** is a mental property. There are three ways in which, given materialism, mental and physical properties can be related. First, nonreductive materialism: While mental properties can't be reduced to physical properties, they *supervene* on them. (Take supervenience as follows: Properties of sort *A* supervene on properties of sort *B* just if necessarily, if entities *x* and *y* differ with respect to their A properties, then they differ with respect to their *B* properties.) The necessity involved can be either broadly logical (metaphysical) necessity, or nomological necessity, giving us two varieties of supervenience, logical and nomological, and hence two possibilities as to the relation of mental properties to physical properties. The third possibility for that relation is reductive materialism: Every mental property is identical with some physical property.

To avoid interspecific chauvinism, suppose we think not about ourselves, but about a population of creatures, perhaps in one of those other cosmoi proposed by inflationary scenarios, who resemble us in holding beliefs, changing beliefs, making inferences, and so on. Suppose also that naturalism holds for these creatures, and that they have come to be by the processes specified in contemporary evolutionary theory. Now ask about P(R/N&E) specified, not to us, but to them; and consider that probability with respect to each of the preceding three suggestions about the relation of mental and physical properties. Consider first logical nonreductive materialism (LNM): Mental properties are distinct from physical properties, but supervene upon them, where the necessity involved is broadly logical. What is P(R/N&E&LNM)? These creatures have evolved; we may therefore assume that their behavior is adaptive, in their circumstances, and that, accordingly, the neurophysiology producing that behavior is also adaptive. But natural selection doesn't give a fig for true belief just as such. It rewards adaptive behavior and punishes maladaptive behavior, but it doesn't care about truth of belief; as Patricia Churchland says, "Truth, whatever that is, definitely takes the hindmost."[20] So choose any particular belief *B* held by one of those creatures. We may assume that *B* is adaptive in that its NP properties are adaptive; but of course nothing follows about the truth or falsehood of the content that supervenes on those properties. If the supervening content is true, excellent; but if it is false, that's just as good. Its falsehood in no way interferes with the adaptivity of the NP properties. We should assume, therefore, that the probability of that belief's being true, given N&E and nonreductive logical supervenience, is about .5. But then the probability of their faculties being reliable will be low. If

you have 100 independent beliefs and the probability of each is .5, the probability that three-fourths of them are true, which is a modest requirement for reliability, will be less than one out of a million.

P(R/N&E&LNM), therefore, is low.

But of course the very same thing will hold, for the same reasons, for P(R/N&E&NNM), where NNM is the version of non-reductive materialism where mental properties supervene upon physical properties with nomological necessity. That leaves reductive materialism (RM). What is P(R/N&E&RM)? Here the property of having such and such a content is identical with some physical, presumably neurological property. Again, consider any particular belief *B* held by one of those creatures. We may suppose that having *B* is adaptive, and adaptive by virtue of its content as well as its other physical properties. But once again, it doesn't matter whether the content associated with *B* is true or false. We may assume that the physical property identical with the property of having *B's* content is adaptive; the content associated with *B* is of course either true or false; if it happens to be false, this in no way compromises the adaptivity of *B*. Once more, then, we must suppose that the probability of that belief's being true is about .5; but then it will be unlikely that the cognitive faculties of these creatures are reliable.

It follows, therefore, that P(R/N&E) with respect to these hypothetical creatures is low. But then of course the same goes for us; P(R/N&E) is low for us as well. The next step is to note that anyone who sees that P(R/N&E) is low, and also accepts N&E, has a defeater for R in her own case, a reason for rejecting R, for giving it up, for no longer believing it. This defeater cannot itself be defeated; that is

because a defeater for this defeater would have to take the form of an argument. But of course one who accepts N&E will also have a defeater for the premises of this argument, as well as the proposition that if the premises are true, so is the conclusion. Another way to put it: Any argument for R will be epistemically circular, in that reliance on the argument presupposes that the conclusion of the argument is true.

But anyone who has a defeater for R has a defeater for any belief she takes to be produced by her cognitive faculties—including, of course, N&E itself. Hence one who accepts N&E (and sees the truth of the first premise) has a defeater for N&E; N&E, therefore, is self-defeating and cannot rationally be accepted. If so, however, there is a conflict between naturalism and evolution; their conjunction cannot rationally be accepted. Evolution, however, is one of the pillars of contemporary science. Hence there is a science–religion or perhaps science–quasi-religion conflict in the neighborhood of evolution, all right, but not between evolution and theistic religion. The real conflict is between evolution, that pillar of contemporary science, and *naturalism*.[21]

NOTES

1. Stephen Jay Gould, *Hen's Teeth and Horse's Toes* (New York: W.W. Norton, 1983), 236.
2. Thus Charles Hodge, the distinguished Princeton theologian, speaking of the design of plants and animals, "If God made them, it makes no difference how He made them, as far as the question of design is concerned, whether at once or by a process of evolution." Charles Hodge, *What Is Darwinism?* (New York: Charles Scribner, 1871), 44.

3. George Gaylord Simpson, *The Meaning of Evolution* (New Haven, CT: Yale University Press, rev. ed., 1967), 344–45.
4. Ernest Mayr, *Toward a New Philosophy of Biology: Observations of an Evolutionist* (Cambridge, MA: Harvard University Press, 1988), 99.
5. Elliott Sober, "Evolution Without Metaphysics?"
6. I don't mean to suggest that no scientific theory can contain metaphysical elements. The suggestion is only that this particular claim is clearly metaphysical, and also clearly an add-on: It isn't part of evolutionary theory as currently stated and understood.
7. John Dupré, *Darwin's Legacy: What Evolution Means Today* (Oxford, UK: Oxford University Press, 2003), 56.
8. Michael Behe, *The Edge of Evolution: The Search for the Limits of Darwinism* (New York: Free Press, 2007).
9. See Bruce Alberts, "The Cell as a Collection of Protein Machines: Preparing the Next Generation of Molecular Biologists," *Cell*, 92: 291–94.
10. Philip Kitcher, "The Conflict Between Science and Religion," in *The Blackwell Guide to the Philosophy of Religion*, ed. William E. Mann (Oxford, UK: Blackwell, 2005), 268.
11. Alfred Tennyson "In Memoriam A. H. H.," *Alfred Lord Tennyson: Selected Poems*, canto 56, 135.
12. See, for example, William Rowe, "The Evidential Argument from Evil: A Second Look," in *The Evidential Argument from Evil*, ed. Daniel Howard-Snyder (Bloomington: Indiana University Press, 1996), and Michael Tooley's statement of the argument in Alvin Plantinga and Michael Tooley, *Knowledge of God* (Malden, MA: Blackwell, 2008), 98ff.
13. See Alvin Plantinga, "Superlapsarianism, or 'O Felix Culpa,'" in *Christian Faith and the Problem of Evil*, ed. Peter van Inwagen (Grand Rapids, MI: Eerdmans, 1994).
14. "P(D/E&G)" and "P(D/E&U)" are to be read as "the probability of D, given E and G" and "the probability of D, given E and U."

15. Thus, according to Bruce Alberts, President of the National Academy of Sciences, "Nearly every process in a cell is carried out by assemblies of 10 or more protein molecules.... Indeed, the entire cell can be viewed as a factory that contains an elaborate network of interacting assembly lines, each of which is composed of a set of large protein machines." Alberts, "The Cell as a Collection of Protein Machines: Preparing the Next Generation of Molecular Biologists," 291.
16. Ernst Haeckel, in John Farley, *The Spontaneous Generation Controversy from Descartes to Oparin*, 2nd ed. (Baltimore, MD: The Johns Hopkins Univ. Press, 1977), 73.
17. Behe, *The Edge of Evolution*.
18. See Alvin Plantinga, *Warranted Christian Belief* (New York: Oxford University Press, 2000), part III, especially ch. 8 and 9.
19. "P(R/N&E)" is to be read as "the probability of R, given N and E."
20. Patricia Churchland, *Journal of Philosophy* (LXXXIV, Oct. 1987), 548.
21. Thanks to Nathan Ballantyne, Mike Bergmann, Brian Boeninger, Tom Crisp, Eric Hagedorn, Matthew Lee, Trenton Merricks, Anne Peterson, Josh Rasmussen, Luke Van Horn, Rene van Woudenberg, and especially Michael Rea.

2

Truths That Miss Their Mark

Naturalism Unscathed

Daniel C. Dennett

I am going to show that three of Professor Plantinga's central claims are right, but only in senses that fail to support his larger project.

I. "Contemporary evolutionary theory is compatible with theistic belief."

II. "[I]t is no part of current evolutionary theory to say that...mutations are random in a sense implying...that they occur just by chance."

III. "Naturalism and evolutionary theory *together* imply the denial of divine design, but evolutionary biology *by itself* doesn't have that implication."

I. "Contemporary evolutionary theory is compatible with theistic belief."

Plantinga is right about this, given the way he defines his terms, and lurking within his claim is an important point I have often stressed myself, since I first expressed it in 1990.

> In our world today, there are organisms we know to be the result of foresighted, goal-seeking redesign efforts, but that knowledge depends on our direct knowledge of recent historical events (we've actually watched the breeders at work), but these special events might not cast any fossily shadows into the future. To take a simpler variation on our thought experiment, suppose we were to send Martian biologists a laying hen, a Pekingese dog, a barn swallow, and a cheetah and ask them to determine which designs bore the mark of intervention by artificial selectors. What could they rely on? How would they argue? They might note that the hen did not care "properly" for her eggs; some varieties of hen have had their instinct for broodiness bred right out of them, and would soon become extinct were it not for the environment of artificial incubators human beings have provided for them. They might note that the Pekingese was pathetically ill suited for fending for itself in any demanding environment. The barn swallow's fondness for carpentered nest sites might fool them into the view that it was some sort of pet, and whatever features of the cheetah convinced them that it was a creature of the wild might also be found in greyhounds, and have been patiently encouraged by breeders. Artificial environments are themselves a part of nature, after all.
>
> Prehistoric fiddling by intergalactic visitors with the DNA of earthly species cannot be ruled out, except on

> grounds that it is an entirely gratuitous fantasy. Nothing we have found (so far) on earth so much as hints that such a hypothesis is worth further exploration. (And note—I hasten to add, lest creationists take heart—that even if we were to discover and translate such a "trademark message" in our spare DNA, this would do nothing to rescind the claim of the theory of natural selection to explain all design in nature without invocation of a foresighted Designer-Creator outside the system. If the theory of evolution by natural selection can account for the existence of the people at NovaGene who dreamt up DNA branding, it can also account for the existence of any predecessors who may have left their signatures around for us to discover.) The power of the theory of natural selection is not the power to prove exactly how (pre-)history was, but only the power to prove how it could have been, given what we know about how things are.[1]

So I agree that contemporary evolutionary theory can't *demonstrate* the absence of intelligent design, and any biologist who insists that we can is overstating the case. But Plantinga must deal with the implications of one sentence in the passage above: "Prehistoric fiddling by intergalactic visitors with the DNA of earthly species cannot be ruled out, except on grounds that *it is an entirely gratuitous fantasy*" (emphasis added). Now we might draw the debate to a close right here. I could happily concede that anybody who wishes to entertain the fantasy that intelligent designers from another galaxy (or another dimension) fiddled with our evolutionary prehistory, or salted Earth with life forms, or even arranged for the constants of physics to take on their particular "local" values will find their fantasy consistent with contemporary evolutionary biology. There is not a shred of evidence for any such fantasy, but it's a free country, and it might be harmless enough to keep such fairy tales alive, but in general, I think, it is wise of

us not to respect such frivolities, since they can, in fact, do serious damage to the epistemological fabric of our society. For instance, they might mislead deluded people into basing policy on them, for instance, by offering public sacrifices to those imagined intelligent designers in hopes of enticing them to return and repair our damaged planet, or, to take two entirely real and utterly deplorable examples, they might mislead deluded people into dismissing environmental concerns since the End Times will soon be upon us in any case, or spawn hatred of a political candidate because he is deemed to be the Antichrist. (I call on all Christians to speak out publicly and explicitly to dismiss as pernicious nonsense such obscene creeds, which have an altogether worrying grip on the popular imagination of too many of our fellow citizens.)

Perhaps, you think, Plantinga's theistic creed is in better position than any science-fictional fantasy. Let us consider, for concreteness's sake, a candidate. Superman, son of Jor-el, also later known as Clark Kent, came from the planet Krypton about 530 million years ago and ignited the Cambrian explosion. Superman "could have caused the right mutations to arise at the right time, he could have preserved populations from perils of various sorts, and so on; in this way, by orchestrating the course of evolution, he could have ensured that there come to be creatures of the kind he intends" (Plantinga, p. 4).

Superman, according to my hypothesis, seeded a handy planet so that in the fullness of time he could have playthings, a sort of Super Ken and Barbie World. A rather adolescent project, perhaps, but nevertheless a motivated instance of intelligent design.

Now the burden of proof falls on Plantinga to show why his theist story deserves any more respect or credence than

this one. I myself cannot see any rational grounds for preferring his theism over my Supermanism—which I don't espouse, but see as perfectly consistent with contemporary evolutionary theory. Moreover, I can describe experiments that *could* make my Superman hypothesis highly probable if they panned out.

Here's a crude example: We drill and dynamite a big crater in the Burgess Shale, and thereby expose, for the first time in over half a billion years, a set of golden plates, not the Angel Moroni's golden plates, but Jor-el's golden plates, which, unlike Moroni's, don't conveniently disappear, and are soon carefully studied by the National Academy of Sciences. The inscriptions on them prove to be instructions from Jor-el to his son, explaining how to ensure that the intended gene duplications occur to hasten the path to new body plans, the evolution of vision, and eventually of vertebrates.

Of course it is just as true that tomorrow the clouds could part, and a giant voice could boom out in all the languages of the world simultaneously, saying "I, Allah, of whom Muhammad is the prophet, have been intervening in evolution for billions of years on this little planet." I wonder if Plantinga would say, "You see? You see? I was right!"

II. Plantinga is right that "it is no part of current evolutionary theory to say that...mutations are random in a sense implying that they are uncaused (they are said to be caused by cosmic rays, for example); still less that they occur just by chance."

This is often misunderstood. As I pointed out in *Elbow Room,*[2] even so great an evolutionist as Nobel Laureate Jacques Monod could make the mistake of thinking that

evolution could not occur in "Laplace's world, from which chance is excluded by definition."[3] Evolution can occur just fine in deterministic worlds, as thousands of deterministic computer models of evolution demonstrate on a daily basis (they are all deterministic, relying on pseudo-random number generators as their source of "random" mutation). Indeterminism is indeed a red herring, both for evolution and for free will, as I have argued for decades.

III. Plantinga's largest claim is that "Naturalism and evolutionary theory *together* imply the denial of divine design, but evolutionary biology *by itself* doesn't have that implication."

This is also true, but in its own special way, which I illustrate with a parallel story:

Fred the nasty art critic has published a scathing review of an exhibit of Tom's art, and is found dead in his apartment the next day, his head bashed in by one of Tom's sculptures, which lies soaked in blood beside the corpse, with the published review draped over the body. Murder most foul, it appears, but at Tom's trial the defense is impressive: The sculpture in question had belonged to Fred for years, and can be seen perched precariously on the high shelf above his reading chair in a photograph taken a week earlier. Moreover, that morning shortly after 9, at which time Fred habitually read the morning paper, a moderate earthquake (see the evidence here on the seismograph) had shaken all the houses in the neighborhood. Many similar items were jiggled off shelves and tables in the neighborhood that day, and there was no evidence that Tom was anywhere nearby: no sign of breaking and entering, no fingerprints, no DNA, etc. In all likelihood, Fred's death was *by natural causes, not a murder, not a death with an intending and intelligent author.*

Tom's acquittal now seems assured, but the prosecutor isn't finished; he calls an expert witness, Professor Plantinga.

"Do you believe Tom murdered Fred?"

"Yes I do."

"But hasn't the defense shown that it was an accident, a death by natural causes, not a murder?"

"No, the defense has shown, I grant, that it *could* have been an accident, but not that it *was* an accident. There is no inconsistency between the case that the defense has made and the proposition, which I find entirely reasonable, that Tom was the deliberate author of Fred's death."

"Do you deny that there was an earthquake sufficient to topple the sculpture?"

"No, but Tom could have arranged for the earthquake to happen just so! Nothing we know in geology *by itself* rules out the possibility that people can cause earthquakes by wishing for them hard enough. Or, as I have said, 'Satan and his minions'... may be involved in one way or another."

"But..."

"I grant you that *naturalism* combined with what we know of geology has the implication that Fred's death was almost certainly not a murder, but naturalism has not been established or even defended in this court."

Of course not, because naturalism is ***tacitly assumed*** in all reputable courts of law, and throughout scientific investigation.

As Plantinga makes clear, naturalism is the creed he wants to discredit. This puts him in an awkward position. If he wants to champion the "much maligned" Michael Behe, he needs to make his peace with naturalism. Behe's so-called scientific work has been carefully judged by the

scientific community and thoroughly rejected. The last thing Michael Behe needs is a defender who insists that naturalism is not to be assumed for the sake of argument. Without naturalism Behe is just another theological speculator, not the scientist he claims to be.

In this regard, a little history is relevant. In 1997, Plantinga and Peter van Inwagen issued a challenge to me. According to them, the Lehigh University biochemist Michael Behe's forthcoming book, *Darwin's Black Box,*[4] was a deeply serious, high-quality challenge to evolutionary theory, and my intellectual integrity as a Darwinian was on the line. Would I debate him? I took their endorsement seriously, and, not being a biochemist, asked for their permission to team up with somebody who knew the technicalities better than I did. I passed on their endorsement of Behe's book to my friend, the eminent Harvard evolutionary biologist David Haig, and he agreed to join me. When copies of the book arrived, we were appalled. This was not at all a serious science book, but hugely disingenuous propaganda, full of telling omissions and misrepresentations. We went to Notre Dame in April and dealt firmly, fairly, and objectively with Behe's claims, pointing out that his arguments were not just inconclusive; they gave every sign of willfully ignoring contrary evidence and argument. There was precious little rebuttal at that meeting in Notre Dame, and I figured that Haig and I had done our duty. I see that Plantinga no longer expresses any endorsement of Behe's first book, but now gives his layman's approval to his second book. I'm not biting. I've paid my dues.

Plantinga says, "If Behe is right, or anywhere near right, the probability of the existence of the cell as we find it is much greater on theism than on naturalism" (p. 9). Since

Plantinga is a layman, as he notes, he is really in no position to assess the antecedent of this claim: He finds the case that Behe makes is "reasonably powerful though far from conclusive." Where might an inquiring layman turn, then, for further guidance? He might turn to the scientific reviews, which have been uniformly devastating.[5] Or he might consider the following argument:

> Let B be "Behe is right, or anywhere near right."
> Let N be "Knowledgeable scientists rush to their labs to steal Behe's thunder and win the Nobel Prizes that will surely be awarded to anyone who demonstrates irreducible complexity."

Here then is my argument:

> P(N/B) is very high. (Remember cold fusion?)
> N is false.
> ∴ P that Behe is right, or anywhere near right, is negligible.

But there is more to be said about this interesting case of a dog that isn't barking. There's one thing Michael Behe is right about: There are large gaps in our detailed accounts of the evolution of many complex features—for the trivial reason that it will take biologists centuries to investigate all the nooks and crannies of the biosphere. But more to the point, there are complex features—are they "irreducibly complex"?—that we know quite a bit about but still haven't much of a clue about how they evolved (if they did).

The question of how they evolved hasn't been studied for an interesting sociological reason: The young researchers who have the training to do it prefer to tackle other topics.

Why? Not because they fear that there is no evolutionary explanation of them, but for roughly the opposite reason. They fear that they would work hard for a decade, solve the problem, and show exactly how the features evolved, and hence are not, in spite of first appearances "irreducibly complex"—and their scientific colleagues would say, in effect, "What else is new? Of course they evolved. Thanks for proving something we never doubted in the first place." It's not just that most researchers, being prudent and cautious with their careers, prefer to work on the low-hanging fruit first, the topics that appear likely to produce significant results in a relatively short time, but that even those who are comfortable with the strategy of risking all for a Nobel Prize no matter how arduous and uncertain the prospect, are pretty sure that no Nobel Prizes are to be found down the ID pathways. That's how sure they are that the theory of evolution by natural selection is fundamentally confirmed. Of course they *might* be wrong, but who would advise them to risk wasting their professional careers on such a hunch?

That's why we should welcome the founding of Biologic, the Redmond, Washington, research entity (funded by the Discovery Institute) designed to house and fund those talented researchers—if such can be found—who think they *can* disprove the theory of evolution.[6] Let's hope they do first-rate science, and fill in a lot of the mildly embarrassing gaps in our knowledge of how various features evolved. If history is any guide, their quest for skyhooks will net them some interesting new cranes, and we'll all learn something. And in the meantime, we needn't lose any sleep over their spending their time on wild goose chases; they'll be on a crusade, and what could be more fulfilling than that, even if you come back empty-handed?

IV. Is naturalism incompatible with evolution?

What, finally, of Plantinga's argument that "naturalism is incompatible with evolution" (p. 17)? He's given the argument elsewhere, he says, so he can be brief. As he surmises, his first premise is the problematic one:

1. P(R/N&E) is low.

In everyday language, this says that the probability is low that our cognitive faculties are reliable, given naturalism and evolutionary theory. I have given the arguments against this premise elsewhere, and at great length, over more than thirty years, so I can be even briefer.[7]

Evolution by natural selection, with its naturalistic presuppositions, *explains why* hearts are highly reliable pumps, lungs are highly reliable blood oxygenators, eyes are highly reliable distal-information acquirers, and the beliefs that are provoked by those eyes (and other senses) are highly reliable truth trackers. I'm not sure what Pat Churchland meant when she said, "Truth, whatever that is, definitely takes the hindmost," but it shouldn't be taken to have the implication Plantinga puts on it. It is true that every belief state is what it is, and locally causes whatever it causes, independently of whether it is true or false. As I have said, our brains are *syntactic engines,* not *semantic engines,* which, like perpetual motion machines, are impossible. But syntactic engines can be designed to track truth, and that is just what evolution has done. A useful comparison might be with a hand calculator.

Arithmetical truth, whatever it is, definitely takes the hindmost, when it comes to what happens inside a hand calculator. For instance, it would be easy enough to design a bogus hand calculator that usually, or always, got its

arithmetical answers wrong. Such a device is just as physically possible as a highly reliable calculator. But for obvious reasons, such devices have not been made. For the same sorts of reasons, unreliable empirical-belief calculators have not been generated by evolution. And in the case of *human* belief generation, we can add that cultural evolution over thousands but not millions of years has honed our belief-tracking systems by detecting and correcting dozens of blind spots and flaws discovered by...the very belief-tracking mechanisms that evolution endowed us with.

Descartes may have thought that we need God's benign intervention to have any trust in our cognitive abilities, but Descartes didn't have the benefit of Darwin's insights when he wrote (cf. my "Descartes's Argument from Design," *Journal of Philosophy* 2008).

NOTES

1. Daniel Dennett, "The Interpretation of Texts, People and Other Artifacts," *Philosophy and Phenomenological Research* (L, Supplement, 177–94, Fall 1990), 189–190.
2. Daniel Dennett, *Elbow Room* (Cambridge, MA: MIT Press, 1984), 149–50.
3. Jacques Monod, *Chance and Necessity* (New York: Knopf, 1971), 115.
4. Michael Behe, *Darwin's Black Box* (New York: Free Press, 1996).
5. See, for example, Sean B. Carroll, "Evolution: God as Genetic Engineer," *Science* (2007, June 8), 1427–1428; P. Z. Myers, http://scienceblogs.com/pharyngula/2007/06/behes_edge_of_evolution_part_i.php.
6. See *New Scientist* (2006, December 16), 9–11.

7. My arguments can be found in Daniel Dennett, *The Intentional Stance* (Cambridge, MA: MIT Press, 1987) and *Darwin's Dangerous Idea* (New York: Simon & Schuster, 1995). Among the others who have offered arguments along these lines are Elliott Sober, *From a Biological Point of View* (Cambridge University Press, 1994); Peter Godfrey Smith, *Complexity and the Function of Mind in Nature* (Cambridge Universtiy Press, 1996); and Kim Sterelny, *Thought in a Hostile World* (Oxford: Blackwell, 2003).