

game. We're content to *argue* with those who disagree with us. We don't kill them.

But I would want to deny even the lesser charge of purely verbal zealotry. There is a very, very important difference between feeling strongly, even passionately, about something because we have thought about and examined the evidence for it on the one hand, and feeling strongly about something because it

has been internally revealed to us, or internally revealed to somebody else in history and subsequently hallowed by tradition. There's all the difference in the world between a belief that one is prepared to defend by quoting evidence and logic and a belief that is supported by nothing more than tradition, authority, or revelation.



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ALVIN PLANTINGA

When Faith and Reason Clash: Evolution and the Bible

My question is simple: how shall we Christians deal with apparent conflicts, between faith and reason, between what we know as Christians and what we know in other ways, between teaching of the Bible and the teachings of science? As a special case, how shall we deal with apparent conflicts between what the Bible initially seems to tell us about the origin and development of life, and what contemporary science seems to tell us about it? Taken at face value, the Bible seems to teach that God created the world relatively recently, that he created life by way of several separate acts of creation, that in another separate act of creation, he created an original human pair, Adam and Eve, and that these our original parents disobeyed God, thereby bringing ruinous calamity on themselves, their posterity and the rest of creation.

According to contemporary science, on the other hand, the universe is exceedingly old—some 15 or 16

billion years or so, give or take a billion or two. The earth is much younger, maybe 4½ billion years old, but still hardly a spring chicken. Primitive life arose on earth perhaps 3½ billion years ago, by virtue of processes that are completely natural if so far not well understood; and subsequent forms of life developed from these aboriginal forms by way of natural processes, the most popular candidates being perhaps random genetic mutation and natural selection.

Now we Reformed Christians are wholly in earnest about the Bible. We are people of the Word; *Sola Scriptura* is our cry; we take Scripture to be a special revelation from God Himself, demanding our absolute trust and allegiance. But we are equally enthusiastic about *reason*, a God-given power by virtue of which we have knowledge of ourselves, our world, our past, logic and mathematics, right and wrong, and God himself; reason is one of the chief features of the image of God in us. And if we are enthusiastic about reason, we must also be enthusiastic about contemporary natural science, which is a powerful and vastly impressive manifestation of reason. So

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this is my question: given our Reformed proclivities and this apparent conflict, what are we to do? How shall we think about this matter?

I. WHEN FAITH AND REASON CLASH

If the question is simple, the answer is enormously difficult. To think about it properly, one must obviously know a great deal of science. On the other hand, the question crucially involves both philosophy and theology: one must have a serious and penetrating grasp of the relevant theological and philosophical issues. And who among us can fill a bill like that? Certainly I can't. (And that, as my colleague Ralph McInerny once said in another connection, is no idle boast.) The scientists among us don't ordinarily have a sufficient grasp of the relevant philosophy and theology; the philosophers and theologians don't know enough science; consequently, hardly anyone is qualified to speak here with real authority. This must be one of those areas where fools rush in and angels fear to tread. Whether or not it is an area where angels fear to tread, it is obviously an area where fools rush in. I hope this essay isn't just one more confirmation of that dismal fact. . . .

As everyone knows, there are various intellectual or cognitive powers, belief-producing mechanisms or powers, various sources of belief and knowledge. For example, there are perception, memory, induction, and testimony, or what we learn from others. There is also reason, taken narrowly as the source of logic and mathematics, and reason taken more broadly as including perception, testimony and both inductive and deductive processes; it is reason taken this broader way that is the source of science. But the serious Christian will also take our grasp of Scripture to be a proper source of knowledge and justified belief. Just how does Scripture work as a source of proper belief? An answer as good as any I now was given by John Calvin and endorsed by the Belgic Confession: this is Calvin's doctrine of the Internal Testimony of the Holy Spirit. This is a fascinating and important contribution that doesn't get nearly the attention it deserves; but here I don't have time to go into the matter. Whatever the mechanism, the Lord speaks to us in Scripture.

And of course what the Lord proposes for our belief is indeed what we should believe. Here there will be enthusiastic agreement on all sides. Some conclude, however, that when there is a conflict between Scripture (or our grasp of it) and science, we must reject science; such conflict automatically shows science to be wrong, at least on the point in question. In the immortal words of the inspired Scottish bard William E. McGonagall, poet and tragedian,

When faith and reason clash,
Let reason go to smash.

But clearly this conclusion doesn't follow. *The Lord* can't make a mistake: fair enough; but *we* can. Our grasp of what the Lord proposes to teach us can be faulty and flawed in a thousand ways. This is obvious, if only because of the widespread disagreement among serious Christians as to just what it is the Lord *does* propose for our belief in one or another portion of Scripture. Scripture is indeed perspicuous: what it teaches with respect to the way of salvation is indeed such that she who runs may read. It is also clear, however, that serious, well-intentioned Christians can disagree as to what the teaching of Scripture, at one point or another, really is. Scripture is inerrant: the Lord makes no mistakes; what he proposes for our belief is what we ought to believe. Sadly enough, however, our grasp of what he proposes to teach is fallible. Hence we cannot simply identify the teaching of Scripture with our grasp of that teaching; we must ruefully bear in mind the possibility that we are mistaken. "He sets the Earth on its foundations; it can never be moved," says the Psalmist.¹ Some sixteenth-century Christians took the Lord to be teaching here that the earth neither rotates on its axis nor goes around the sun; and they were mistaken.

So we can't identify our understanding or grasp of the teaching of Scripture with the teaching of Scripture; hence we can't automatically assume that conflict between what we see as the teaching of Scripture, and what we seem to have learned in some other way must always be resolved in favor of the former. Sadly enough, we have no guarantee that on every point our grasp of what Scripture teaches is correct; hence it is possible that our grasp of the teaching of Scripture be corrected or improved by what we learn in some other way—by way of science, for example.

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But neither, of course, can we identify either the current deliverances of reason or our best contemporary science (or philosophy, or history, or literary criticism, or intellectual efforts of any kind) with the truth. No doubt what reason, taken broadly, teaches is by and large reliable; this is, I should think, a consequence of the fact that we have been created in the image of God. Of course we must reckon with the fall and its noetic effects; but the sensible view here, overall, is that the deliverances of reason are for the most part reliable. Perhaps they are most reliable with respect to such common everyday judgments as that there are people here, that it is cold outside, that the pointer points to 4, that I had breakfast this morning, that $2 + 1 = 3$, and so on; perhaps they are less reliable when it comes to matters near the limits of our abilities, as with certain questions in set theory, or in areas for which our faculties don't seem to be primarily designed, as perhaps in the world of quantum mechanics. By and large, however, and over enormous swatches of cognitive territory, reason is reliable.

Still, we can't simply embrace current science (or current anything else either) as the truth. We can't identify the teaching of Scripture with our grasp of it because serious and sensible Christians disagree as to what Scripture teaches; we can't identify the current teachings of science with truth, because the current teachings of science change. And they don't change just by the accumulation of new facts. A few years back, the dominant view among astronomers and cosmologists was that the universe is infinitely old; at present the prevailing opinion is that the universe began some 16 billion years ago; but now there are straws in the wind suggesting a step back towards the idea that there was no beginning.² Or think of the enormous changes from nineteenth- to twentieth-century physics. A prevailing attitude at the end of the nineteenth century was that physics was pretty well accomplished; there were a few loose ends here and there to tie up and a few mopping up operations left to do, but the fundamental lineaments and characteristics of physical reality had been described. And we all know that happened next.

As I said above, we can't automatically assume that when there is a conflict between science and our grasp of the teaching of Scripture, it is science that is wrong and must give way. But the same holds

vice versa; when there is a conflict between our grasp of the teaching of Scripture and current science, we can't assume that it is our interpretation of Scripture that is at fault. It *could* be that, but it doesn't *have* to be; it could be because of some mistake or flaw in current science. The attitude I mean to reject was expressed by a group of serious Christians as far back as 1832, when deep time was first being discovered; "If sound science appears to contradict the Bible," they said, "we may be sure that it is our interpretation of the Bible that is at fault."³ To return to the great poet McGonagall.

When faith and reason clash,
'Tis faith must go to smash.

This attitude—the belief that when there is a conflict, the problem must inevitably lie with our interpretation of Scripture, so that the correct course is always to modify that understanding in such a way as to accommodate current science—is every bit as deplorable as the opposite error. No doubt science can correct our grasp of Scripture; but Scripture can also correct current science. If, for example, current science were to return to the view that the world has no beginning, and is infinitely old, then current science would be wrong.

So what, precisely, must we do in such a situation? Which do we go with: faith or reason? More exactly, which do we go with, our grasp of Scripture or current science? I don't know of any infallible rule, or even any pretty reliable general recipe. All we can do is weigh and evaluate the relative warrant, the relative backing or strength, of the conflicting teachings. We must do our best to apprehend both the teachings of Scripture and the deliverances of reason; in either case we will have much more warrant for some apparent teachings than for others. It may be hard to see just what the Lord proposes to teach us in the Song of Solomon or Old Testament genealogies; it is vastly easier to see what he proposes to teach us in the Gospel accounts of Christ's resurrection from the dead. On the other side, it is clear that among the deliverances of reason is the proposition that the earth is round rather than flat; it is enormously harder to be sure, however, that contemporary quantum mechanics, taken realistically, has things right.⁴ We must make as careful an estimate as we can of the degrees of warrant of the

conflicting doctrines; we may then make a judgment as to where the balance of probability lies, or alternatively, we may suspend judgment. After all, we don't *have* to have a view on all these matters.

Let me illustrate from the topic under discussion. Consider that list of apparent teachings of Genesis: that God has created the world, that the earth is young, that human beings and many different kinds of plants and animals were separately created, and that there was an original human pair whose sin has afflicted both human nature and some of the rest of the world. At least one of these claims—the claim that the universe is young—is very hard to square with a variety of types of scientific evidence: geological, paleontological, cosmological and so on. Nonetheless a sensible person might be convinced, after careful and prayerful study of the Scriptures, that what the Lord teaches there implies that this evidence is misleading and that as a matter of fact the earth really *is* very young. So far as I can see, there is nothing to rule this out as automatically pathological or irrational or irresponsible or stupid.

And of course this sort of view can be developed in more subtle and nuanced detail. For example, the above teachings may be graded with respect to the probability that they really are what the Lord intends us to learn from early Genesis. Most clear, perhaps, is that God created the world, so that it and everything in it depends upon him and neither it nor anything in it has existed for an infinite stretch of time. Next clearest, perhaps, is that there was an original human pair who sinned and through whose sinning disaster befell both man and nature; for this is attested to not only here but in many other places in Scripture. That humankind was separately created is perhaps less clearly taught; that many other kinds of living beings were separately created might be still less clearly taught; that the earth is young, still less clearly taught. One who accepted all of these theses ought to be much more confident of some than of others—both because of the scientific evidence against some of them, and because some are much more clearly the teachings of Scripture than others. I do not mean to endorse the view that all of these propositions are true: but it isn't just silly or irrational to do so. One need not be a fanatic, or a Flat Earther, or an ignorant Fundamentalist in order to hold it. In my judgment the view is mis-

taken, because I take the evidence for an old earth to be strong and the warrant for the view that the Lord teaches that the earth is young to be relatively weak. But these judgments are not simply *obvious*, or inevitable, or such that anyone with any sense will automatically be obliged to agree.

II. FAITH AND EVOLUTION

So I can properly correct my view as to what reason teaches by appealing to my understanding of Scripture; and I can properly correct my understanding of Scripture by appealing to the teachings of reason. It is of the first importance, however, that we correctly *identify* the relevant teachings of reason. Here I want to turn directly to the present problem, the apparent disparity between what Scripture and science teach us about the origin and development of life. Like any good Christian Reformed preacher, I have three points here. First, I shall argue that the theory of evolution is by no means religiously or theologically neutral. Second, I want to ask how we Christians should in fact think about evolution; how probable is it, all things considered, that the Grand Evolutionary Hypothesis is true? And third, I want to make a remark about how, as I see it, our intellectuals and academics should serve us, the Christian community, in this area.

A. Evolution Religiously Neutral?

According to a popular contemporary myth, science is a cool, reasoned, wholly dispassionate attempt to figure out the truth about ourselves and our world, entirely independent of religion, or ideology, or moral convictions, or theological commitments. I believe this is deeply mistaken. Following Augustine (and Abraham Kuyper, Herman Dooyeweerd, Harry Jellema, Henry Stob and other Reformed thinkers), I believe that there is conflict, a battle between the *Civitas Dei*, the City of God, and the City of the World. As a matter of fact, what we have, I think, is a three-way battle. On the one hand there is Perennial Naturalism, a view going back to the ancient world, a view according to which there is no God, nature is all there is, and mankind is to be understood as a part of nature. Second, there is what I

shall call 'Enlightenment Humanism': we could also call it 'Enlightenment Subjectivism' or 'Enlightenment Antirealism': this way of thinking goes back substantially to the great eighteenth-century enlightenment philosopher Immanuel Kant. According to its central tenet, it is really we human beings, we men and women, who structure the world, who are responsible for its fundamental outline and lineaments. Naturally enough, a view as startling as this comes in several forms. According to Jean Paul Sartre and his existentialist friends, we do this world-structuring freely and individually; according to Ludwig Wittgenstein and his followers we do it communally and by way of language; according to Kant himself it is done by the transcendental ego which, oddly enough, is neither one nor many, being itself the source of the one-many structure of the world. So two of the parties to this three-way contest are Perennial Naturalism and Enlightenment Humanism; the third party, of course, is Christian theism. Of course there are many unthinking and ill-conceived combinations, much blurring of lines, many cross currents and eddies, many halfway houses, much halting between two opinions. Nevertheless I think these are the three basic contemporary Western ways of looking at reality, three basically *religious* ways of viewing ourselves and the world. The conflict is real, and of profound importance. The stakes, furthermore, are high; this is a battle for men's souls.

Now it would be excessively naive to think that contemporary science is religiously and theologically neutral, standing serenely above this battle and wholly irrelevant to it. Perhaps *parts* of science are like that: mathematics, for example, and perhaps physics, or parts of physics—although even in these areas there are connections.⁵ Other parts are obviously and deeply involved in this battle: and the closer the science in question is to what is distinctively human, the deeper the involvement.

To turn to the bit of science in question, the theory of evolution plays a fascinating and crucial role in contemporary Western culture. The enormous controversy about it is what is most striking, a controversy that goes back to Darwin and continues full force today. Evolution is the regular subject of courtroom drama; one such trial—the spectacular Scopes trial of 1925—has been made the subject of an ex-

remely popular film. Fundamentalists regard evolution as the work of the Devil. In academia, on the other hand, it is an idol of the contemporary tribe; it serves as a shibboleth, a litmus test distinguishing the ignorant and bigoted fundamentalist goats from the properly acculturated and scientifically receptive sheep. Apparently this litmus test extends far beyond the confines of this terrestrial globe: according to the Oxford biologist Richard Dawkins, "If superior creatures from space ever visit earth, the first question they will ask, in order to assess the level of our civilization, is: 'Have they discovered evolution yet?'" Indeed many of the experts—for example, Dawkins, William Provine, Stephen Gould—display a sort of revulsion at the very idea of special creation by God, as if this idea is not merely not good science, but somehow a bit obscene, or at least unseemly; it borders on the immoral; it is worthy of disdain and contempt. In some circles, confessing to finding evolution attractive will get you disapproval and ostracism and may lose you your job; in others, confessing doubts about evolution will have the same doleful effect. In Darwin's day, some suggested that it was all well and good to discuss evolution in the universities and among the *cognoscenti*; they thought *public* discussion unwise, however; for it would be a shame if the lower classes found out about it. Now, ironically enough, the shoe is sometimes on the other foot; it is the devotees of evolution who sometimes express the fear that public discussion of doubts and difficulties with evolution could have harmful political effects.⁶

So why all the furor? The answer is obvious: evolution has deep religious connections; deep connections with how we understand ourselves at the most fundamental level. Many evangelicals and fundamentalists see in it a threat to the faith, they don't want it taught to their children, at any rate as scientifically established fact, and they see acceptance of it as corroding proper acceptance of the Bible. On the other side, among the secularists, evolution functions as a *myth*, in a technical sense of that term: a shared way of understanding ourselves at the deep level of religion, a deep interpretation of ourselves to ourselves, a way of telling us why we are here, where we come from, and where we are going.

It was serving in this capacity when Richard Dawkins (according to Peter Medawar, "one of the most brilliant of the rising generation of biologists")

leaned over and remarked to A. J. Ayer at one of those elegant, candle-lit, bibulous Oxford dinners that he couldn't imagine being an atheist before 1859 (the year Darwin's *Origin of Species* was published); "although atheism might have been logically tenable before Darwin," said he, "Darwin made it possible to be an intellectually fulfilled atheist."⁷ (Let me recommend Dawkins' book to you: it is brilliantly written, unflinchingly fascinating, and utterly wrongheaded. It was second on the British best-seller list for some considerable time, second only to Mamie Jenkins' *Hip and Thigh Diet*.) Dawkins goes on:

All appearances to the contrary, the only watchmaker in nature is the blind forces of physics, albeit deployed in a very special way. A true watchmaker has foresight: he designs his cogs and springs, and plans their interconnections, with a future purpose in his mind's eye. Natural selection, the blind, unconscious automatic process which Darwin discovered, and which we now know is the explanation for the existence and apparently purposeful form of all life, has no purpose in mind. It has no mind and no mind's eye. It does not plan for the future. It has no vision, no foresight, no sight at all. If it can be said to play the role of watchmaker in nature, it is the *blind* watchmaker (p. 5).

Evolution was functioning in that same mythic capacity in the remark of the famous zoologist G. G. Simpson: after posing the question "What is man?" he answers, "The point I want to make now is that all attempts to answer that question before 1859 are worthless and that we will be better off if we ignore them completely."⁸ Of course it also functions in that capacity in serving as a litmus test to distinguish the ignorant fundamentalists from the properly enlightened *cognoscenti*; it functions in the same way in many of the debates, in and out of the courts, as to whether it should be taught in the schools, whether other views should be given equal time, and the like. Thus Michael Ruse: "the fight against creationism is a fight for all knowledge, and that battle can be won if we all work to see that Darwinism, which has had a great past, has an even greater future."⁹

The essential point here is really Dawkins' point: Darwinism, the Grand Evolutionary Story, makes it possible to be an intellectually fulfilled atheist. What

he means is simple enough. If you are Christian, or a theist of some other kind, you have a ready answer to the question, how did it all happen? How is it that there are all the kinds of floras and faunas we behold; how did they all get here? The answer, of course, is that they have been created by the Lord. But if you are not a believer in God, things are enormously more difficult. How did all these things get here? How did life get started and how did it come to assume its present multifarious forms? It seems monumentally implausible to think these forms just popped into existence; that goes contrary to all our experience. So how did it happen? Atheism and Secularism need an answer to this question. And the Grand Evolutionary Story gives the answer: somehow life arose from non-living matter by way of purely natural means and in accord with the fundamental laws of physics; and once life started, all the vast profusion of contemporary plant and animal life arose from those early ancestors by way of common descent, driven by random variation and natural selection. I said earlier that we can't automatically identify the deliverances of reason with the teaching of current science because the teaching of current science keeps changing. Here we have another reason for resisting that identification: a good deal more than reason goes into the acceptance of such a theory as the Grand Evolutionary Story. For the nontheist, evolution is the only game in town; it is an essential part of any reasonably complete nontheistic way of thinking; hence the devotion to it, the suggestions that it shouldn't be discussed in public, and the venom, the theological odium with which dissent is greeted.

B. The Likelihood of Evolution

Of course the fact that evolution makes it possible to be a fulfilled atheist doesn't show either that the theory isn't true or that there isn't powerful evidence for it. Well then, how likely is it that this theory is true? Suppose we think about the question from an explicitly theistic and Christian perspective; but suppose we temporarily set to one side the evidence, whatever exactly it is, from early Genesis. From this perspective, how good is the evidence for the theory of evolution?

The first thing to see is that a number of *different* large-scale claims fall under this general rubric of

evolution. First, there is the claim that the earth is very old, perhaps some 4.5 billion years old: The *Ancient Earth Thesis*, as we may call it. Second, there is the claim that life has progressed from relatively simple to relatively complex forms of life. In the beginning there was relatively simple unicellular life, perhaps of the sort represented by bacteria and blue green algae, or perhaps still simpler unknown forms of life. (Although bacteria are simple compared to some other living beings, they are in fact enormously complex creatures.) Then more complex unicellular life, then relatively simple multicellular life such as seagoing worms, coral, and jelly fish, then fish, then amphibia, then reptiles, birds, mammals, and finally, as the culmination of the whole process, human beings: the *Progress Thesis*, as we humans may like to call it (jelly fish might have a different view as to where the whole process culminates). Third, there is the *Common Ancestry Thesis*: that life originated at only one place on earth, all subsequent life being related by descent to those original living creatures—the claim that, as Stephen Gould puts it, there is a “tree of evolutionary descent linking all organisms by ties of genealogy.”¹⁰ According to the Common Ancestry Thesis, we are literally cousins of all living things—horses, oak trees and even poison ivy—distant cousins, no doubt, but still cousins. (This is much easier to imagine for some of us than for others.) Fourth, there is the claim that there is a (naturalistic) *explanation* of this development of life from simple to complex forms; call this thesis *Darwinism*, because according to the most popular and well-known suggestions, the evolutionary mechanism would be natural selection operating on random genetic mutation (due to copy error or ultra violet radiation or other causes); and this is similar to Darwin’s proposals. Finally, there is the claim that life itself developed from non-living matter without any special creative activity of God but just by virtue of the ordinary laws of physics and chemistry: call this the *Naturalistic Origins Thesis*. These five theses are of course importantly different from each other. They are also logically independent in pairs, except for the third and fourth theses: the fourth entails the third, in that you can’t sensibly propose a mechanism or an explanation for evolution without agreeing that evolution has indeed occurred. The combination of all five of these theses is what I have been calling “The Grand Evolutionary Story”; the Common Ancestry Thesis together

with Darwinism (remember, Darwinism isn’t the view that the mechanism driving evolution is just what Darwin says it is) is what one most naturally thinks of as the Theory of Evolution.

So how shall we think of these five theses? First, let me remind you once more that I am no expert in this area. And second, let me say that, as I see it, the empirical or scientific evidence for these five different claims differs enormously in quality and quantity. There is excellent evidence for an ancient earth: a whole series of interlocking different kinds of evidence, some of which is marshalled by Howard van Till in *The Fourth Day*. Given the strength of this evidence, one would need powerful evidence on the other side—from Scriptural considerations, say—in order to hold sensibly that the earth is young. There is less evidence, but still good evidence in the fossil record for the Progress Thesis, the claim that there were bacteria before fish, fish before reptiles, reptiles before mammals, and mice before men (or wombats before women, for the feminists in the crowd). The third and fourth theses, the Common Ancestry and Darwinian Theses, are what is commonly and popularly identified with evolution; I shall return to them in a moment. The fourth thesis, of course, is no more likely than the third, since it includes the third and proposes a mechanism to account for it. Finally, there is the fifth thesis, the Naturalistic Origins Thesis, the claim that life arose by naturalistic means. This seems to me to be for the most part mere arrogant bluster; given our present state of knowledge, I believe it is vastly less probable, on our present evidence, than is its denial. Darwin thought this claim very chancy; discoveries since Darwin and in particular recent discoveries in molecular biology make it much less likely than it was in Darwin’s day. I can’t summarize the evidence and the difficulties here.¹¹

Now return to evolution more narrowly so-called: the Common Ancestry Thesis and the Darwinian Thesis. Contemporary intellectual orthodoxy is summarized by the 1979 edition of the *New Encyclopedia Britannica*, according to which “evolution is accepted by all biologists and natural selection is recognized as its cause. . . . Objections . . . have come from theological and, for a time, from political standpoints” (Vol. 7). It goes on to add that “Darwin did two things; he showed that evolution was in fact con-

tradicting Scriptural legends of creation and that its cause, natural selection, was automatic, with no room for divine guidance or design." According to most of the experts, furthermore, evolution, taken as the Thesis of Common Ancestry, is not something about which there can be sensible difference of opinion. Here is a random selection of claims of certainty on the part of the experts. Evolution is certain, says Francisco J. Ayala, as certain as "the roundness of the earth, the motions of the planets, and the molecular constitution of matter."¹² According to Stephen J. Gould, evolution is an established fact, not a mere theory; and no sensible person who was acquainted with the evidence could demur.¹³ According to Richard Dawkins, the theory of evolution is as certainly true as that the earth goes around the sun. This comparison with Copernicus apparently suggests itself to many; according to Philip Spieth, "A century and a quarter after the publication of the *Origin of Species*, biologists can say with confidence that universal genealogical relatedness is a conclusion of science that is as firmly established as the revolution of the earth about the sun."¹⁴ Michael Ruse trumpets, or perhaps screams, that "evolution is Fact, FACT, FACT!" If you venture to suggest doubts about evolution, you are likely to be called ignorant or stupid or worse. In fact this isn't merely *likely*; you have already *been* so-called: in a recent review in the *New York Times*, Richard Dawkins claims that "It is absolutely safe to say that if you meet someone who claims not to believe in evolution, that person is ignorant, stupid or insane (or wicked, but I'd rather not consider that)." (Dawkins indulgently adds that "You are probably not stupid, insane or wicked, and ignorance is not a crime. . . .")

Well then, how should a serious Christian think about the Common Ancestry and Darwinian Theses? The first and most obvious thing, of course, is that a Christian holds that all plants and animals, past as well as present, have been created by the Lord. Now suppose we set to one side what we take to be the best understanding of early Genesis. Then the next thing to see is that God could have accomplished this creating in a thousand different ways. It was entirely within his power to create life in a way corresponding to the Grand Evolutionary scenario: it was within his power to create matter and energy, as in the Big Bang, together with laws for its behav-

ior, in such a way that the outcome would be first, life's coming into existence three or four billion years ago, and then the various higher forms of life, culminating, as we like to think, in humankind. This is a semideistic view of God and his workings: he starts everything off and sits back to watch it develop. (One who held this view could also hold that God constantly *sustains* the world in existence—hence the view is only *semideistic*—and even that any given causal transaction in the universe requires specific divine concurrent activity.)¹⁵ On the other hand, of course, God could have done things very differently. He has created matter and energy with their tendencies to behave in certain ways—ways summed up in the laws of physics—but perhaps these laws are *not* such that given enough time, life would automatically arise. Perhaps he did something different and special in the creation of life. Perhaps he did something different and special in creating the various kinds of animals and plants. Perhaps he did something different and special in the creation of human beings. Perhaps in these cases his action with respect to what he has created was different from the ways in which he ordinarily treats them.

How shall we decide which of these is initially the more likely? This is not an easy question. It is important to remember, however, that the Lord has not merely left the Cosmos to develop according to an initial creation and an initial set of physical laws. According to Scripture, he has often intervened in the working of his cosmos. This isn't a good way of putting the matter (because of its deistic suggestions); it is better to say that he has often treated what he has created in a way different from the way in which he ordinarily treats it. There are miracles reported in Scripture, for example; and, towering above all, there is the unthinkable gift of salvation for humankind by way of the life, death, and resurrection of Jesus Christ, his son. According to Scripture, God has often treated what he has made in a way different from the way in which he ordinarily treats it; there is therefore no initial edge to the idea that he would be more likely to have created life in all its variety in the broadly deistic way. In fact it looks to me as if there is an initial probability on the other side; it is a bit more probable, before we look at the scientific evidence, that the Lord created life and some of its forms—in particular human life—specially.

From this perspective, then, how shall we evaluate the evidence for evolution? Despite the claims of Ayala, Dawkins, Gould, Simpson and the other experts, I think the evidence here has to be rated as ambiguous and inconclusive. The two hypotheses to be compared are (1) the claim that God has created us in such a way that (a) all of contemporary plants and animals are related by common ancestry, and (b) the mechanism driving evolution is natural selection working on random genetic variation and (2) the claim that God created mankind as well as many kinds of plants and animals separately and specially, in such a way that the thesis of common ancestry is false. Which of these is the more probable, given the empirical evidence and the theistic context? I think the second, the special creation thesis, is somewhat more probable with respect to the evidence (given theism) than the first.

There isn't the space, here, for more than the merest hand waving with respect to marshalling and evaluating the evidence. But according to Stephen Jay Gould, certainly a leading contemporary spokesman,

our confidence that evolution occurred centers upon three general arguments. First, we have abundant, direct observational evidence of evolution in action, from both field and laboratory. This evidence ranges from countless experiments on change in nearly everything about fruit flies subjected to artificial selection in the laboratory to the famous populations of British moths that became black when industrial soot darkened the trees upon which the moths rest. . . .¹⁶

Second, Gould mentions homologies: "Why should a rat run, a bat fly, a porpoise swim, and I type this essay with structures built of the same bones," he asks, "unless we all inherited them from a common ancestor?" Third, he says, there is the fossil record:

transitions are often found in the fossil record. Preserved transitions are not common, . . . but they are not entirely wanting. . . . For that matter, what better transitional form could we expect to find than the oldest human, *Australopithecus afarensis*, with its apelike palate, its human upright stance, and a cranial capacity larger than any ape's of the same body size but a full 1000

cubic centimeters below ours? If God made each of the half-dozen human species discovered in ancient rocks, why did he create in an unbroken temporal sequence of progressively more modern features, increasing cranial capacity, reduced face and teeth, larger body size? Did he create to mimic evolution and test our faith thereby?¹⁷

Here we could add a couple of other commonly cited kinds of evidence: (a) we along with other animals display vestigial organs (appendix, coccyx, muscles that move ears and nose); it is suggested that the best explanation is evolution. (b) There is alleged evidence from biochemistry: according to the authors of a popular college textbook, "All organisms . . . employ DNA, and most use the citric acid cycle, cytochromes, and so forth. It seems inconceivable that the biochemistry of living things would be so similar if all life did not develop from a single common ancestral group."¹⁸ There is also (c) the fact that human embryos during their development display some of the characteristics of simpler forms of life (for example, at a certain stage they display gill-like structures). Finally, (d) there is the fact that certain patterns of geographical distribution—that there are orchids and alligators only in the American south and in China, for example—are susceptible to a nice evolutionary explanation.

Suppose we briefly consider the last four first. The arguments from vestigial organs, geographical distribution and embryology are suggestive, but of course nowhere near conclusive. As for the similarity in biochemistry of all life, this is reasonably probable on the hypothesis of special creation, hence not much by way of evidence against it, hence not much by way of evidence for evolution.

Turning to the evidence Gould develops, it too is suggestive, but far from conclusive; some of it, furthermore, is seriously flawed. First, those famous British moths didn't produce a new species; there were both dark and light moths around before, the dark ones coming to predominate when the industrial revolution deposited a layer of soot on trees, making the light moths more visible to predators. More broadly, while there is wide agreement that there is such a thing as microevolution, the question is whether we can extrapolate to macroevolution, with the claim that enough microevolution can ac-

count for the enormous differences between, say, bacteria and human beings. There is some experiential reason to think not; there seems to be a sort of envelope of limited variability surrounding a species and its near relatives. Artificial selection can produce several different kinds of fruit flies and several different kinds of dogs, but, starting with fruit flies, what it produces is only more fruit flies. As plants or animals are bred in a certain direction, a sort of barrier is encountered; further selective breeding brings about sterility or a reversion to earlier forms. Partisans of evolution suggest that in nature, genetic mutation of one sort or another can appropriately augment the reservoir of genetic variation. That it can do so sufficiently, however, is not known; and the assertion that it does is a sort of Ptolemaic epicycle attaching to the theory.

Next, there is the argument from the fossil record; but as Gould himself points out, the fossil record shows very few transitional forms. "The extreme rarity of transitional forms in the fossil record," he says, "persists as the trade secret of paleontology. The evolutionary trees that adorn our textbooks have data only at the tips and nodes of their branches; the rest is inference, however reasonable, not the evidence of fossils."¹⁹ Nearly all species appear for the first time in the fossil record fully formed, without the vast chains of intermediary forms evolution would suggest. Gradualistic evolutionists claim that the fossil record is woefully incomplete. Gould, Eldredge and others have a different response to this difficulty: punctuated equilibriumism, according to which long periods of evolutionary stasis are interrupted by relatively brief periods of very rapid evolution. This response helps the theory accommodate some of the fossil data, but at the cost of another Ptolemaic epicycle.²⁰ And still more epicycles are required to account for puzzling discoveries in molecular biology during the last twenty years.²¹ And as for the argument from homologies, this too is suggestive but far from decisive. First, there are of course many examples of architectural similarity that are not attributed to common ancestry, as in the case of the Tasmanian wolf and the European wolf; the anatomical givens are by no means conclusive proof of common ancestry. And secondly, God created several different kinds of animals; what would prevent him from using similar structures?

But perhaps the most important difficulty lies in a slightly different direction. Consider the mammalian eye: a marvelous and highly complex instrument resembling a telescope of the highest quality, with a lens, an adjustable focus, a variable diaphragm for controlling the amount of light, and optical corrections for spherical and chromatic aberration. And here is the problem: how does the lens, for example, get developed by the proposed means—random genetic variation and natural selection—when at the same time there has to be development of the optic nerve, the relevant muscles, the retina, the rods and cones, and many other delicate and complicated structures, all of which have to be adjusted to each other in such a way that they can work together? Indeed, what is involved isn't, of course, just the eye; it is the whole visual system, including the relevant parts of the brain. Many different organs and suborgans have to be developed together, and it is hard to envisage a series of mutations which is such that each member of the series has adaptive value, is also a step on the way to the eye, and is such that the last member is an animal with such an eye.

We can consider the problem a bit more abstractly. Think of a sort of space, in which the points are organic forms (possible organisms) and in which neighboring forms are so related that one could have originated from the other with some minimum probability by way of random genetic mutation. Imagine starting with a population of animals without eyes, and trace through the space in question all the paths that lead from this form to forms with eyes. The chief problem is that the vast majority of these paths contain long sections with adjacent points such that there would be no adaptive advantage in going from one point to the next, so that, on Darwinian assumptions, none of them could be the path in fact taken. How could the eye have evolved in this way, so that each point on its path through that space would be adaptive and a step on the way to the eye? (Perhaps it is possible that some of these sections could be traversed by way of steps that were not adaptive and were fixed by genetic drift; but the probability of the population's crossing such stretches will be much less than that of its crossing a similar stretch where natural selection is operative.) Darwin himself wrote, "To suppose that the eye, with all its inimitable contrivances . . . could have been formed by natural selection seems absurd in

the highest degree." "When I think of the eye, I shudder" he said (3-4). And the complexity of the eye is enormously greater than was known in Darwin's time.

We are never, of course, given the *actual* explanation of the evolution of the eye, the actual evolutionary history of the eye (or brain or hand or whatever). That would take the form: in that original population of eyeless life forms, genes A_1 - A_n mutated (due to some perhaps unspecified cause), leading to some structural and functional change which was adaptively beneficial; the bearers of A_1 - A_n thus had an advantage and came to dominate the population. Then genes B_1 - B_n mutated in an individual or two, and the same thing happened again; then gene C_1 - C_n , etc. Nor are we even given any possibilities of these sorts. (We couldn't be, since, for most genes, we don't know enough about their functions.) We are instead treated to broad brush scenarios at the macroscopic level: perhaps reptiles gradually developed feathers, and wings, and warm-bloodedness, and the other features of birds. We are given possible evolutionary histories, not of the detailed genetic sort mentioned above, but broad macroscopic scenarios: what Gould calls "just-so stories."

And the real problem is that we don't know how to evaluate these suggestions. To know how to do *that* (in the case of the eye, say), we should have to start with some population of animals without eyes; and then we should have to know the rate at which mutations occur for that population; the proportion of those mutations that are on one of those paths through that space to the condition of having eyes; the proportion of *those* that are adaptive, and, at each stage, given the sort of environment enjoyed by the organisms at that stage, the rate at which such adaptive modifications would have spread through the population in question. Then we'd have to compare our results with the time available to evaluate the probability of the suggestion in question. But we don't know what these rates and proportions are. No doubt we *can't* know what they are, given the scarcity of operable time-machines; still, the fact is we don't know them. And hence we don't really know whether evolution is so much as biologically possible: maybe there is no path through that space. It is *epistemically* possible that evolution has occurred—that is, we don't know that it hasn't; for all we know, it has. But

it doesn't follow that it is *biologically* possible. (Whether every even number is the sum of two primes is an open question; hence it is epistemically possible that every even number is the sum of two primes, and also epistemically possible that some even numbers are not the sum of two primes; but one or the other of those epistemic possibilities is in fact mathematically impossible.) Assuming that it *is* biologically possible, furthermore, we don't know that it is not prohibitively improbable (in the statistical sense), given the time available. But then (given the Christian faith and leaving to one side our evaluation of the evidence from early Genesis) the right attitude towards the claim of universal common descent is, I think, one of certain interested but wary skepticism. It is *possible* (epistemically possible) that this is how things happened; God could have done it that way; but the evidence is ambiguous. That it is *possible* is clear; that it *happened* is doubtful; that it is *certain*, however, is ridiculous.

But then what about all those exuberant cries of certainty from Gould, Ayala, Dawkins, Simpson and the other experts? What about those claims that evolution, universal common ancestry, is a rock-ribbed certainty, to be compared with the fact that the earth is round and goes around the sun? What we have here is at best enormous exaggeration. But then what accounts for the fact that these claims are made by such intelligent luminaries as the above? There are at least two reasons. First, there is the cultural and religious, the mythic function of the doctrine evolution helps make it possible to be an intellectually fulfilled atheist. From a naturalistic point of view, this is the only answer in sight to the question "How did it all happen? How did all this amazing profusion of life get here?" From a nontheistic point of view, the evolutionary hypothesis is the only game in town. According to the thesis of universal common descent, life arose in just one place, then there was constant development by way of evolutionary mechanisms from that time to the present, this resulting in the profusion of life we presently see. On the alternative hypothesis, different forms of life arose independently of each other; on that suggestion there would be many different genetic trees, the creatures adorning one of these trees genetically unrelated to those on another. From a nontheistic perspective, the first hypothesis will be by far the more probable, if only

because of the extraordinary difficulty in seeing how life could arise even once by any ordinary mechanisms which operate today. That it should arise many different times and at different levels of complexity in this way, is quite incredible.

From a naturalist perspective, furthermore, many of the arguments for evolution are much more powerful than from a theistic perspective. (For example, *given* that life arose naturalistically, it is indeed significant that all life employs the same genetic code.) So from a naturalistic, nontheistic perspective the evolutionary hypothesis will be vastly more probable than alternatives. Many leaders in the field of evolutionary biologists, of course, *are* naturalists—Gould, Dawkins, and Stebbins, for example; and according to William Provine, “very few truly religious evolutionary biologists remain. Most are atheists, and many have been driven there by their understanding of the evolutionary process and other science.”²² If Provine is right or nearly right, it becomes easier to see why we hear this insistence that the evolutionary hypothesis is certain. It is also easy to see how this attitude is passed on to graduate students, and, indeed, how accepting the view that evolution is certain is itself adaptive for life in graduate school and academia generally.

There is a second and related circumstance at work here. We are sometimes told that natural science is *natural* science. So far it is hard to object: but how shall we take the term ‘natural’ here? It could mean that natural science is science devoted to the study of nature. Fair enough. But it is also taken to mean that natural science involves a *methodological naturalism* or provisional atheism:²³ no hypothesis according to which God has done this or that can qualify as a *scientific* hypothesis. It would be interesting to look into this matter: is there really any compelling or even decent reason for thus restricting our study of nature? But suppose we irenically concede, for the moment, that natural science doesn’t or shouldn’t invoke hypotheses essentially involving God. Suppose we restrict our explanatory materials to the ordinary laws of physics and chemistry; suppose we reject divine special creation or other hypotheses about God as *scientific* hypotheses. Perhaps indeed the Lord has engaged in special creation, so we say, but that he has (if he has) is not something with which natural science can deal. So far as natu-

ral science goes, therefore, an acceptable hypothesis must appeal only to the laws that govern the ordinary, day-to-day working of the cosmos. As natural scientists we must eschew the supernatural—although, of course, we don’t mean for a moment to embrace naturalism.

Well, suppose we adopt this attitude. Then perhaps it looks as if by far the most probable of all the properly scientific hypotheses is that of evolution by common ancestry: it is hard to think of any other real possibility. The only alternatives, apparently, would be creatures popping into existence fully formed, and that is wholly contrary to our experience. Of all the scientifically acceptable explanatory hypotheses, therefore, evolution seems by far the most probable. But if this hypothesis is vastly more probable than any of its rivals, then it must be certain, or nearly so.

But to reason this way is to fall into confusion compounded. In the first place, we aren’t just given that one or another of these hypotheses is in fact correct. Granted: if we *knew* that one or another of those scientifically acceptable hypotheses were in fact correct, then perhaps this one would be certain; but of course we don’t know that. One real possibility is that we don’t have a very good idea how it all happened, just as we may not have a very good idea as to what terrorist organization has perpetrated a particular bombing. And secondly, this reasoning involves a confusion between the claim that of all of those *scientifically* acceptable hypotheses, that of common ancestry is by far the most plausible, with the vastly more contentious claim that of all the acceptable hypotheses *whatever* (now placing no restrictions on their kind) this hypothesis is by far the most probable. Christians in particular ought to be alive to the vast difference between these claims; confounding them leads to nothing but confusion.

From a Christian perspective, it is dubious, with respect to our present evidence, that the Common Ancestry Thesis is true. No doubt there has been much by way of microevolution: Ridley’s gulls are an interesting and dramatic case in point. But it isn’t particularly likely, given the Christian faith and the biological evidence, that God created all the flora and fauna by way of some mechanism involving common ancestry. My main point, however, is that Ayala, Gould, Simpson, Stebbins and their coterie

are wildly mistaken in claiming that the Grand Evolutionary Hypothesis is *certain*. And hence the source of this claim has to be looked for elsewhere than in sober scientific evidence.

So it could be that the best scientific hypothesis was evolution by common descent—i.e., of all the hypotheses that conform to methodological naturalism, it is the best. But of course what we really want to know is not which hypothesis is the best from some artificially adopted standpoint of naturalism, but what the best hypothesis is *overall*. We want to know what the *best* hypothesis is, not which of some limited class is best—particularly if the class in question specifically excludes what we hold to be the basic truth of the matter. It could be that the best scientific hypothesis (again supposing that a scientific hypothesis must be naturalistic in the above sense) isn't even a strong competitor in *that* derby.

Judgments here, of course, may differ widely between believers in God and non-believers in God. What for the former is at best a methodological restriction is for the latter the sober metaphysical truth; her naturalism is not merely provisional and methodological, but, as she sees it, settled and fundamental. But believers in God can see the matter differently. The believer in God, unlike her naturalist counterpart, is free to look at the evidence for the Grand Evolutionary Scheme and follow it where it leads, rejecting that scheme if the evidence is insufficient. She has a freedom not available to the naturalist. The latter accepts the Grand Evolutionary Scheme because from a naturalistic point of view this scheme is the only visible answer to the question *what is the explanation of the presence of all these marvelously multifarious forms of life?* The Christian, on the other hand, knows that creation is the Lord's; and she isn't blinkered by *a priori* dogmas as to how the Lord must have accomplished it. Perhaps it was by broadly evolutionary means, but then again perhaps not. At the moment, 'perhaps not' seems the better answer.

Returning to methodological naturalism, if indeed natural science is essentially restricted in this way, if such a restriction is a part of the very essence of science, then what we need here, of course, is not natural science, but a broader inquiry that can include *all* that we know, including the truths that God has created life on earth and could have done it in many different ways. "Unnatural Science," "Creation Sci-

ence," "Theistic Science"—call it what you will: what we need when we want to know how to think about the origin and development of contemporary life is what is most plausible from a Christian point of view. What we need is a scientific account of life that isn't restricted by that methodological naturalism.

C. What Should Christian Intellectuals Tell the Rest of Us?

Alternatively, how can Christian intellectuals—scientists, philosophers, historians, literary and art critics, Christian thinkers of every sort—how can they best serve the Christian community in an area like this? How can they—and since we are they, how can we—best serve the Christian community, the Reformed community of which we are a part, and more importantly, the broader general Christian community? One thing our experts can do for us is help us avoid rejecting evolution for stupid reasons. The early literature of Creation-Science, so-called, is littered with arguments of that eminently rejectable sort. Here is such an argument. Considering the rate of human population growth over the last few centuries, the author points out that even on a most conservative estimate the human population of the earth doubles at least every 1000 years. Then if, as evolutionists claim, the first humans existed at least a million years ago, by now the human population would have doubled 1000 times. It seems hard to see how there could have been fewer than two original human beings, so at that rate, by the inexorable laws of mathematics, after only 60,000 years or so, there would have been something like 36 quintillion people, and by now there would have to be 2^{1000} human beings. 2^{1000} is a large number; it is more than 10^{300} , 1 with 300 zeros after it; if there were that many of us the whole universe would have to be packed solid with people. Since clearly it isn't, human beings couldn't have existed for as long as a million years; so the evolutionists are wrong. This is clearly a lousy argument; I leave as homework the problem of saying just where it goes wrong. There are many other bad arguments against evolution floating around, and it is worth our while to learn that these arguments are indeed bad. We shouldn't reject contemporary science unless we have to, and we shouldn't reject it for the wrong reasons. It is a

good thing for our scientists to point out some of those wrong reasons.

But I'd like to suggest, with all the diffidence I can muster, that there is something better to do here—or at any rate something that should be done in addition to this. And the essence of the matter is fairly simple, despite the daunting complexity that arises when we descend to the nitty-gritty level where the real work has to be done. The first thing to see, as I said before, is that Christianity is indeed engaged in a conflict, a battle. There is indeed a battle between the Christian community and the forces of unbelief. This contest or battle rages in many areas of contemporary culture—the courts, in the so-called media and the like—but perhaps most particularly in academia. And the second thing to see is that important cultural forces such as science are not neutral with respect to this conflict—though of course certain parts of contemporary science and many contemporary scientists might very well be. It is of the first importance that we discern in detail just *how* contemporary science—and contemporary philosophy, history, literary criticism and so on—is involved in the struggle. This is a complicated, many-sided matter; it varies from discipline to discipline, and from area to area within a given discipline. One of our chief tasks, therefore, must be that of cultural criticism. We must *test* the spirits, not automatically welcome them because of their great academic prestige. Academic prestige, wide, even nearly unanimous acceptance in academia, declarations of certainty by important scientists—none of these is a guarantee that what is proposed is true, or a genuine deliverance of reason, or plausible from a theistic point of view. Indeed, none is a guarantee that what is proposed is not animated by a spirit wholly antithetical to Christianity. We must discern the religious and ideological connections; we can't automatically take the word of the experts, because their word might be dead wrong from a Christian standpoint.

Finally, in all the areas of academic endeavor, we Christians must think about the matter at hand from a Christian perspective; we need Theistic Science. Perhaps the discipline in question, as ordinarily practiced, involves a methodological naturalism; if so, then what we need, finally, is not answers to our questions from *that* perspective, valuable in some

ways as it may be. What we really need are answers to our questions from the perspective of *all* that we know—what we know about God, and what we know by faith, by way of revelation, as well as what we know in other ways. In many areas, this means that Christians must rework, rethink the area in question from this perspective. This idea may be shocking, but it is not new. Reformed Christians have long recognized that science and scholarship are by no means religiously neutral. In a way this is our distinctive thread in the tapestry of Christianity, our instrument in the great symphony of Christianity. This recognition underlay the establishment of the Free University of Amsterdam in 1880; it also underlay the establishment of Calvin College. Our forebears recognized the need for the sort of work and inquiry I've been mentioning, and tried to do something about it. What we need from our scientists and other academics, then, is both cultural criticism and Christian science.

We must admit, however, that it is our *lack* of real progress that is striking. Of course there are good reasons for this. To carry out this task with the depth, the authority, the competence it requires is, first of all, enormously difficult. However, it is not just the *difficulty* of this enterprise that accounts for our lackluster performance. Just as important is a whole set of historical or sociological conditions. You may have noticed that at present the Western Christian community is located in the twentieth-century Western world. We Christians who go on to become professional scientists and scholars attend twentieth-century graduate schools and universities. And questions about the bearing of Christianity on these disciplines and the questions within them do not enjoy much by way of prestige and esteem in these universities. There are no courses at Harvard entitled "Molecular Biology and the Christian View of Man." At Oxford they don't teach a course called "Origins of Life from a Christian Perspective." One can't write his Ph.D. thesis on these subjects. The National Science Foundation won't look favorably on them. Working on these questions is not a good way to get tenure at a typical university; and if you are job hunting you would be ill-advised to advertise yourself as proposing to specialize in them. The entire structure of contemporary university life is such as to discourage serious work on these questions.

This is therefore a matter of uncommon difficulty. So far as I know, however, no one in authority has promised us a rose garden; and it is also a matter of absolutely crucial importance to the health of the Christian community. It is worthy of the very best we can muster; it demands powerful, patient, unstinting and tireless effort. But its rewards match its demands; it is exciting, absorbing and crucially important. Most of all, however, it needs to be done. I therefore commend it to you.

NOTES

1. Ps. 104 vs. 5.
2. See Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988) pp. 115ff.
3. *Christian Observer* 1832, p. 437.
4. Here the work of Bas van Fraassen is particularly instructive.
5. As with intuitionist and constructivist mathematics, idealistic interpretations of quantum mechanics and Bell theoretical questions about information transfer violating relativity constraints on velocity.
6. According to Anthony Flew, to suggest that there is real doubt about evolution is to corrupt the youth.
7. Richard Dawkins, *The Blind Watchmaker* (London and New York: W. W. Norton and Co., 1986), pp. 6 and 7.
8. Quoted in Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976), p. 1.
9. *Darwinism Defended*, pp. 326–327.
10. “Evolution as Fact and Theory” in *Hen’s Teeth and Horse’s Toes* (New York: Norton, 1983).
11. Let me refer you to the following books: *The Mystery of Life’s Origins*, by Charles Thaxton, Walter Bradley and Roger Olsen; *Origins*, by Robert Shapiro, *Evolution, Thermodynamics, and Information: Extending the Darwinian Program*, by Jeffrey S. Wicken, *Seven Clues to the Origin of Life and Genetic Takeover and the Mineral Origins of Life*, by A. G. Cairns-Smith, and *Origins of Life*, by Freeman Dyson; see also the relevant chapters of Michael Denton, *Evolution: A Theory in Crisis*. The authors of the first book believe that God created life specially, the authors of the others do not.
12. “The Theory of Evolution: Recent Successes and Challenges,” in *Evolution and Creation*, ed. Ernan McMullin (Notre Dame: University of Notre Dame Press, 1985), p. 60.
13. “Evolution as Fact and Theory” in *Hen’s Teeth and Horse’s Toes* (New York: W. W. Norton and Company, 1980), pp. 254–55.
14. “Evolutionary Biology and the Study of Human Nature,” presented at a consultation on Cosmology and Theology sponsored by the Presbyterian (USA) Church in Dec. 1987.
15. The issues here are complicated and subtle and I can’t go into them; instead I should like to recommend my colleague Alfred Freddoso’s powerful piece, “Medieval Aristotelianism and the Case against Secondary Causation in Nature,” in *Divine and Human Action*, edited by Thomas Morris (Ithaca: Cornell University Press, 1988).
16. *Op. cit.*, p. 257.
17. *Op. cit.*, pp. 258–259.
18. Claude A. Villee, Eldra Pearl Solomon, P. William Davis, *Biology*, Saunders College Publishing 1985, p. 1012. Similarly, Mark Ridley [*The Problems of Evolution* (Oxford: Oxford University Press, 1985)] takes the fact that the genetic code is universal across all forms of life as proof that life originated only once; it would be extremely improbable that life should have stumbled upon the same code more than once.
19. *The Panda’s Thumb* (New York: 1980), p. 181. According to George Gaylord Simpson (1953): “Nearly all categories above the level of families appear in the record suddenly and are not led up to by known, gradual, completely continuous transitional sequences.”
20. And even so it helps much less than you might think. It does offer an explanation of the absence of fossil forms intermediate with respect to closely related or adjoining species; the real problem, though, is what Simpson refers to in the quote in the previous footnote: the fact that nearly all categories above the level of families appear in the record suddenly without the gradual and continuous sequences we should expect. Punctuated equilibriumism does nothing to explain the nearly complete absence, in the fossil record, of intermediates between such major divisions as, say, reptiles and birds, or fish and reptiles, or reptiles and mammals.
21. Here see Michael Denton, *Evolution: A Theory in Crisis* (London: Burnet Books, 1983) chapter 12.
22. *Op. cit.*, p. 28.
23. “Science must be provisionally atheistic or cease to be itself.” Basil Whitley, “Darwin’s Place in the History of Thought” in M. Banton, ed., *Darwinism and the Study of Society* (Chicago: Quadrangle Books, 1961).



ERNAN McMULLIN

Evolution and Special Creation

How did God bring the ancestral living things to be? Two broadly different sorts of answer have found favor with believers in a Creator. One is to suppose that God brings the universe into existence already containing the potentialities that are required in order that the complexities of the world we know should "naturally" develop within it. The other is to say that for some of these complexities to develop, God had to "supplement" nature in certain respects, to act in a special way, special not only in the sense of being different from God's ordinary sustaining of the order accessible to us through natural science, but also in the sense that the interruption of that order is aimed at bringing about results that could not otherwise come to be. The first answer is the evolutionary one. What precise *theories* of evolution one chooses to defend is another matter. *Evolution* is a generic label for the natural process whereby potentialities already present are actualized. The second alternative has the somewhat clumsy title of *special creation*.

One who defends the hypothesis of special creation to account for the origin of a particular sort of being (like the first living cells or the first humans) may be quite content to allow an evolutionary account in other contexts. And one who argues, in principle, for the sufficiency of evolutionary models may (if a theist) insist that the natural order itself is created, dependent on God for its very existence. What separates the two is not the general admissibility of the notions of evolution and creation, but the need for "special" episodes in the

story of cosmic development. According to one account, they were needed; according to the other, they were not. On the face of it, both sides need to exercise logical caution. How can those who invoke special creation to account for a particular cosmic transition exclude the possibility that an as-yet unthought of evolutionary explanation might later be found for it? Short of providing an already-completed evolutionary account, how could defenders of evolution exclude the possibility that special creation might have occurred at some juncture? The evolutionist is not required to hold (and if a theist will not hold) that special creation is in principle *impossible*, only that it is in general unlikely, or unneeded in specific contexts.

The vigorously negative reaction to the claims of "creation science" in recent decades might easily lead one to overlook the logical and epistemological complexities of the underlying disagreement between proponents of evolution and proponents of special creation. What came to be called creation science was an aberrant solution forced on defenders of the special creation alternative by the constraints imposed on public school education due to the accepted interpretation of the Constitution of the United States. Its manifest logical inadequacy led ultimately to the legal findings in the celebrated Overton judgment (Arkansas, 1981) striking down the mandatory teaching of creation science as an alternative to evolution¹ and might easily mislead one into supposing that special creation can at this point be dismissed out of hand in discussions of the origins of life. But creation science is only one of the many variant versions of special creation, and assuredly one of the more vulnerable.

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It seems worthwhile, then, to look closely at a very different and much more sophisticated sort of defense of special creation. Alvin Plantinga is a well-known philosopher of religion whose work in epistemology, metaphysics, and modal logic is widely known and justly respected. In a recent essay, "When Faith and Reason Clash: Evolution and the Bible," he proclaims the merits of special creation in the light of what he perceives as inadequacies in the current evolutionary account of origins, and he proposes the antecedent likelihood, in a general way, of special creation from the theological standpoint of the Christian.² His principal targets are those evolutionists who, he believes, covertly rely on an antitheistic premise in order to make inflated claims for the certainty of what he calls the "Grand Evolutionary Scheme." His essay is an extended exercise in the epistemology of scientific theory from the perspective of a religious believer; though I disagree with some of its main conclusions, I shall not, I hope, underrate their force.

THEISTIC SCIENCE

Plantinga's thesis in regard to evolution is that, for the Christian, the claim that God created humankind, as well as many kinds of plants and animals, separately and specially, is more probable than the thesis of common ancestry (TCA) that is central to the theory of evolution (Plantinga 1991a, 22, 28). His larger context is that of an exhortation to Christian intellectuals to join battle against "the forces of unbelief," particularly in academia, instead of always yielding to "the word of the experts." These intellectuals must be brought to "discern the religious and ideological connections; . . . [they must not] automatically take the word of the experts, because their word might be dead wrong from a Christian standpoint" (1991a, 30). The implication many would take from this is that Christian intellectuals should ally themselves with the critics of evolution, that it may somehow be to their *advantage* to find flaws in the case for evolution.

The "science" these Christian intellectuals profess will not be of the usual naturalist sort. Their account of the origin of species, for instance, will be at odds with that given by Darwin, on grounds that are dis-

tinguishingly Christian in content. Despite the fact that claims such as these on the part of the Christian depend on what he or she knows "by faith, by way of revelation," Plantinga believes that they can appropriately be called science, and he suggests as a label for them "theistic science" (1991a, 29). An important function of this broader knowledge would be revisionary; he reminds us that "Scripture can correct current science." His theistic science bears some similarity to the creation science that has commanded the headlines in the United States so often in recent decades. Like the creation scientists, he maintains that in the present state of knowledge the best explanation of the origin of many kinds of plants and animals is an interruption in the ordinary course of natural process, a moment when God treats "what he has created in a way different from the way in which he ordinarily treats it" (1991a, 22). Like them, he relies on a critique of the theory of evolution, pointing to what he regards as fundamental shortcomings in the Darwinian project of explaining new species by means of natural selection and emphasizing recent criticisms of one or other facet of the synthetic theory from within the scientific community itself. Like them, he calls for a struggle against prevailing scientific orthodoxy, one that may pit the teachers of Christian youth against the "experts."

But the differences between Plantinga and the creation scientists are even more basic. Most of the latter believe in a "young earth" dating back only a few thousand years, and they attempt to undermine the many arguments that can be brought against this view. Plantinga allows "the evidence for an old earth to be strong and the warrant for the view that the Lord teaches that the earth is young to be relatively weak" (1991a, 15). The creation scientists argue for a whole series of related cosmological theses (that stars and galaxies do not change, that the history of the earth is dominated by the occurrence of catastrophe, and so forth); Plantinga focuses on the single issue of the origins of living things, especially of humankind. And he is in the end more concerned with combating the claims of certainty made by many evolutionists than he is with arguing that the Christian is irrevocably committed against a full evolutionary account of origins. He allows, as the creation scientists, I suspect, would not, that as evolutionary science advances, his own present estimate

that special creation is more likely to account for some of the major transitions in the story of life on earth might have to give way.

In the debates regarding the teaching of creation science in the public schools, its defenders attempted to detach their arguments from any sort of reliance on Scripture, or more generally, from theological considerations, whereas Plantinga appeals explicitly to the scriptural understanding of the manner of God's action in the world. The former make a heroic attempt to qualify their creationism as scientific, in what they take to be the conventional sense of the term *scientific*. Their effort, I think it is fair to say, was hopeless right from the start. They would undoubtedly have preferred to defend a view more explicitly based on Genesis, but the exigencies of the constitutional restrictions on the public school curriculum prevented this. The scientists among them attempted to shore up their case by citing various consonances between the catastrophism of their young-earth account and the geological record. But the inspiration for their account lay, and clearly *had* to lie, in the Bible. Trying to fudge this, though understandable under the circumstances, proved a disastrous strategy.

Plantinga offers a far more consistent theme. True, his "theistic science" will not pass constitutional muster, so it will not serve the purposes for which creation science was originally advanced. But that is not an argument against it; it is merely a consequence of the unique situation of public education in the United States, a situation that imposes losses as well as gains. I do not think, however, that theistic science should be described *as* science. It lacks the universality of science, as that term has been understood in the later Western tradition.³ It also lacks the sort of warrant that has gradually come to characterize a properly "scientific" knowledge of nature, one that favors systematic observation, generalization, and the testing of explanatory hypothesis. Theistic science appeals to a specifically Christian belief, one that lays no claim to assent from a Hindu or an agnostic. It requires faith, and faith (we are told) is a gift, a grace, from God. To use the term *science* in this context seems dangerously misleading; it encourages expectations that cannot be fulfilled.

Plantinga objects to the sort of methodological naturalism that would deny the label *science* to any

explanation of natural process that invokes the special action of God; indeed, he characterizes it, in Basil Willey's phrase, as provisional atheism. "Is there really any compelling or even decent reason for thus restricting our study of nature?" he asks (Plantinga 1991a, 27). But, of course, methodological naturalism does not restrict our study of nature; it just lays down which sort of study qualifies as *scientific*. Calling on the special action of God to explain the origins of the major phyla in the way Plantinga does transcends the boundaries of science.⁴ This is not primarily because God is involved (Aristotle's argument for a First Mover, for example, could be counted a broadly naturalistic one), but because the action is a special one inaccessible to any sort of test on our part and because of the sort of evidence that has to be invoked, evidence that does not lend itself to evaluation by the standard techniques of natural science, however loosely these be defined.⁵

If someone wants to pursue another approach to nature—and there are many others—the methodological naturalist has no reason to object. Scientists *have* to proceed in this way; the methodology of natural science gives no purchase on the claim that a particular event or type of event is to be explained by invoking God's "special" action or by calling on the testimony of Scripture. Calling this *methodological* naturalism is simply a way of drawing attention to the fact that it is a way of characterizing a particular *methodology*, no more. In particular, it is not an ontological claim about what sort of agency is or is not possible. Dubbing it *provisional atheism* is objectionable; the scientist who does not include among the alternatives to be tested when attempting to explain some phenomenon an action that would not lend itself to such tests is surely not to be accused of atheism, even of a provisional sort. "What we need," Plantinga tells us, "is a scientific account of life that isn't restricted by methodological naturalism" (1991a, 29). But, of course, if it is not so restricted, it is simply improper to call it *scientific*, in the light of long and unequivocal contrary usage.

Let me make myself clear. I do not object (as the concluding section of this essay makes clear) to the use of theological considerations in the service of a larger and more comprehensive world view in which natural science is only one factor. I would be willing to use the term *knowledge* in an extended sense here,

though I am well aware of some old and intricate issues about how faith and knowledge are to be related. (See, for example, Kellenberger 1972, ch. 10.) But I would not be willing to use the term *science* in this context. Nor do I think it necessary to do so in order to convey the respectability of the claim being made: that theology may appropriately modulate other parts of a person's belief-system, including those deriving from science. I would be much more restrictive than Plantinga is, however, in allowing for the situation he describes as "Scripture correcting current science."⁶ But before I analyze our differences, it may be useful first to lay out the large areas where we agree.

POINTS OF AGREEMENT

What really galls Plantinga are the views of people like Richard Dawkins and William Provine who not only insist that evolution is a proven "fact," but who suppose that this somehow undercuts the reasonableness of any sort of belief in a Creator. Their argument hinges on the notion of design. The role of the Creator in traditional religious belief (they claim) was that of designer; the success of the theory of evolution has shown that design is unnecessary. Hence, there is no longer any valid reason to be a theist. In a recent review of a history of the creationist debate in the United States, Provine lays out this case, and concludes that Christian belief can be made compatible with evolutionary biology only by supposing that God "works through the laws of nature" instead of actively steering biological process by way of miraculous intervention. But his view of God, he says, is "worthless," and "equivalent to atheism" (Provine 1987). (On this last point, Plantinga and he might not be so far apart.) He chides scientists for publicly denying, presumably on pragmatic grounds, that evolution and Christian belief are incompatible; they *must*, he says, know this to be nonsense.

Plantinga puts his finger on an important point when he notes that for someone who does not believe in God, evolution in some form or other is the only *possible* answer to the question of origins. Prior to the publication of *The Origin of Species* in 1859, the argument from design for a Creator was widely regarded as resting directly on biological science.

The founders of physico-theology two centuries earlier (naturalists like John Ray and William Derham) had shown the pervasive presence in nature of means-end relationships, the apparently purposive adjusting of structure and instinctive behavior to the welfare of each kind of organism. Someone who rejected the idea of a designer, therefore, had to face some awkward problems in explaining some of the most obvious features of the living world; it seemed to many as though science itself testified to the existence of God (McMullin 1988).⁷

Darwin changed all this. By undermining the classical arguments from design, he showed that atheism was not, after all, inconsistent with biological science; from then on, the fortunes of atheism as a form of intellectual belief would, to some extent at least, be perceived as depending upon the fortunes of the theory of evolution. No wonder, then, that evolution became a crucial myth of our secular culture (as Plantinga puts it), replacing for many the Christian myth as "a shared way of understanding ourselves at the deep level of religion" (Plantinga 1991a, 17). No wonder also that an attack on the credentials of evolutionary theory would so often evoke from its defenders a reaction reminiscent in its ferocity of the response to heresy in other days.

Is evolution fact or theory? No other question has divided the two sides in the creation-science controversy as sharply. Plantinga argues that someone who denies the existence of a Creator is left with no other option for explaining the origin of living things than an evolutionary-type account. The account thus becomes "fact" not just because of the strength of the scientific evidence in its favor, but because, for the atheist, no other explanation is available. Plantinga objects to the use of the word *fact* in this context because it seems to exclude in principle the possibility of divine intervention, and hence by implication, the possibility of the existence of a Creator. *Fact* seems to convey not just the assurance of a well-supported theory, but the certainty that no other explanation is open.

The debate may often, therefore, be something other than it seems. Instead of being just a disagreement about the weight to be accorded to a particularly complex scientific theory in the light of the evidence available, the debate may conceal a far more fundamental religious difference, each side

appearing to the other to call into question an article of faith. Religious believers point out that calling the thesis of common ancestry a *fact* violates good scientific usage; no matter how well-supported a theory may be (they argue), it remains a theory. To nonbelievers, the phrase *merely a theory* comes as a provocation because it suggests a substantial doubt about a claim that appears to them as being beyond question, a doubt prompted furthermore in their view by an illegitimate intrusion of religious belief.

At one level, then, Plantinga's essay can be read as a plea for a more informed understanding of the real nature of the creation-science debate, and a more sympathetic appreciation of what led the proponents of creation science to take the stand they did. Even their defense of a "young" earth (a major point of disagreement between his view and theirs) ought not (he says) to be regarded as "silly or irrational"; a "sensible person" might well subscribe to it after a careful study of the Scriptures. One need not be "a fanatic, or a Flat Earther, or an ignorant Fundamentalist" to hold such a view (Plantinga 1991a, 15). The claim that the earth is ancient is neither obvious nor inevitable; it has to be argued for, and disagreement may, therefore, legitimately occur.

Plantinga is right, to my mind, to see more in the creation-science debate than evolutionary scientists (or the media) have been wont to allow. And the sort of challenge he offers to the defenders of evolution, though it is not new, could serve the purposes of science in the long run if it forces a clarification and strengthening of argument on the other side, or if it punctures the sometimes troubling smugness that experts tend to display when dealing with outsiders. Plantinga leans too far in the other direction, however. In the first place, those who affirm that "evolution is a fact" are not necessarily committed to a covert denial of God's existence. The affirmation itself is, of course, an ambiguous one. A plausible construal of it in this context might run as follows: The belief that the relationships attested to by the fossil record, by comparative morphology, and by molecular biology are best explained in broadly evolutionary terms is true. Calling a theoretical belief *true* customarily means that the cumulative evidence in its favor is so strong that it is safe to affirm it without qualification, just as a geologist might, for example, affirm that the continents of Africa and South Amer-

ica, once in physical contact, have gradually separated from one another. This ought *not* be taken to mean that the alternative can be logically excluded in a completely conclusive way; nothing more than overwhelming likelihood is what scientists normally intend by this sort of usage. One may *object* to this usage, but one cannot impute an implicitly atheistic premise to those who follow it. Such a premise *may* be playing a covert role, but it is equally possible that it may not.

In the second place, the reading of creation science that he urges is rather too charitable. A claim does not have to be obvious or inevitable for its rejection to connote fanaticism or ignorance. If the indirect evidence for the great age of the earth is overwhelming (Plantinga himself allows that it is "strong"), if its denial would call into question some of the best-supported theoretical findings of an array of natural sciences (cosmology, astrophysics, geology, biology), then one is entitled to issue a severe judgment on the legitimacy of the challenge. Perusal of some of the standard works in creation science would lead one to suspect that no matter *how* strong the scientific case were in favor of an ancient earth, it would make no difference to their authors. Their implicit commitment to a literalist interpretation of *Genesis* is such that (to my mind, at least) it appears to block a genuinely rational assessment of the alternatives.

What bothers Plantinga, I suspect, about the use of terms like *fanaticism* here is that from *his* point of view the creation-scientist's heart is in the right place. Anyone who stands up for the maxim of *sola Scriptura* ("Scripture alone") in the modern world, even in contexts as unpromising as the debate about the age of the earth, ought not (he suggests) simply be dismissed as irrational. Creation-scientists may be wrong in holding that the earth is only a few thousand years old, but their intellectual commitment to Scripture ought to be regarded with sympathy by their fellow Christians. I am much less sympathetic to them, in part because of a deeper disagreement about the merits of the *sola Scriptura* premise as well as of the remaining major theses of creation science. Though I would not be as harsh on creation scientists as leading evolutionists have been, I would, as a Christian, want to register disapproval of creation science at least as strong as the

latter's, though for reasons that differ in part from theirs. These reasons will become clear, I hope, in what I have to say about Plantinga's analysis of what happens when "faith and reason clash." . . .

THE ANTECEDENT LIKELIHOOD OF SPECIAL CREATION

The most distinctive feature of Plantinga's argument is that he makes a point of *not* calling explicitly upon the two creation narratives in Genesis. Historically, these narratives have provided the main warrant for the traditional Christian belief that God intervened in a special way in the origins of the living world. Defenders of that belief have tended to rely on Genesis, unless they were prevented from doing so, as the recent advocates of creation science were, by extrinsic constraints. Plantinga is, however, under no such constraints. His reason for eschewing the reference to Genesis that one might have expected to find is, rather, an awareness of the problematic character of the literalist approach to the Genesis story of creation (Plantinga 1991b, 81). Instead, he rests his case not on specific scriptural passages, but on a central defining theme in the biblical account of God's dealings with the people of Israel. In this context, at least, God evidently "intervened" or "interrupted" normal human routines in all sorts of ways. (Words like *intervene* are inadequate to convey the action of a Creator with the created universe, Plantinga reminds us, but we do not have any better ones.) Since the God of Abraham brought about God's ends in "special" ways throughout the long history of Israel, it is to be expected (Plantinga suggests) that the same may very well be true at some moments in the much longer story of the development of life on earth.

The issue, be it noted, is not whether God *could* have intervened in the natural order; it is presumably within the power of the Being who holds the universe at every moment in existence to shape that existence freely. The issue, is, rather, whether it is antecedently *likely* that God would do so, and more specifically whether such intervention would have taken the form of special creation of ancestral living kinds. Attaching a degree of *likelihood* to this requires a reason; despite the avowed intention not to

call on Genesis, there might appear to be some sort of residual linkage here. In the absence of the Genesis narrative, would it appear likely that the God of the salvation story would also act in a special way to bring the ancestral living kinds into existence? It hardly seems to be the case.

Might it be that the supposed likelihood of special creation in given cases (e.g., for the "founders" of the major phyla) derives directly from the unlikelihood of there being a scientific explanation in such cases? If there are only two possible types of explanation, and one can be shown to be highly improbable on present evidence, the other automatically gains in likelihood. In this event, a reference to God's dealings with Israel would not be needed. But Plantinga made it clear that this was not his strategy: "It is a bit more probable, *before we look at the scientific evidence*, that the Lord created life and some of its forms—in particular human life—specially" (1991a, 22, emphasis mine).

It is this casting of special creation and evolution as rivals in the domain of cosmological explanation that I find so troubling. If one assumes that there is a presumption in favor of some sort of special creation at the critical moments in the historical development of life (a presumption whose plausibility wanes in regard to specific transitions as the strength of the evolutionary explanation of those transitions increases) one inevitably transforms the field of prehistory into a battleground where the religious believer is engaged in constant skirmishes with the protagonists of evolutionary-type theories, skirmishes that most often end in forced retreat for the religious believer.

Plantinga claims that the Christian believer "has a freedom not available to the naturalist," because the believer is "free to look at the evidence . . . and follow where it leads" (1991a, 28). This would be more persuasive if he were to hold only that the believer holds an extra alternative that allows him or her to be more critical of the shortcomings of the scientific theory. But he proposes something much stronger than that: There is an antecedent *likelihood*, he says, of "special" intervention of this kind at some points in the cosmic process, and hence where the scientific case is weak, the hypothesis of divine intervention has to be allowed the higher likelihood. I am not sure that this *does* in the end allow the Christian believer more freedom than the naturalist. But whatever one

makes of that, it certainly ensures conflict; it is likely to maximize the strain between faith and reason, as the believer searches for the expected gaps in the scientific account.

In his 1991b, Plantinga appears to change ground somewhat. On the one hand, he says: "I remain confident that TCA is relatively unlikely given a Christian or theistic perspective and the empirical evidence" (1991b, 108). But now the warrant for claiming the antecedent likelihood of special creation appears to shift from the salvation story to the "empirical evidence." Quoting Francis Crick and Harold Keen on the difficulty of explaining how the first cells originated, he concludes that "we have every reason to doubt that life arose simply by the workings of the laws of physics" (1991b, 102). He goes on:

It therefore looks as if God did something special in the creation of life. (Of course, things may change; that is how things look *now*.) And if he did something special in creating life, what would prevent him from doing something special at other points, in creating human life, for example, or other forms of life? . . . I am therefore inclined to maintain my suggestion that the antecedent probability, from a theistic point of view, is somewhat against the idea that all the kinds of plants and animals, as well as humankind, would arise just by the workings of the laws of physics and chemistry. (1991b, 102)

The antecedent probability (no longer strictly antecedent) now seems to depend on the current lack of plausible scientific accounts of how the first cells could have originated. (Crick, who is notably unsympathetic to theistic belief, would surely not agree with the inference being drawn from this!) In his 1991b, Plantinga is more intent on shifting the burden of proof, and on combating claims for the antecedent probability, on theological grounds, of a naturalist account favoring TCA. If TCA were correct, "we should expect much stronger evidence than we actually have. . . . The actual empirical evidence must be allowed to speak more loudly than speculative theological assumptions" (1991b, 102). So much for his original claim that the story of God's dealings with Israel spoke loudly in favor of special creation over TCA! . . .

THE INTEGRITY OF GOD'S NATURAL WORLD

Plantinga's original argument relied on the premise that God's special intervention in the cosmic process is antecedently probable. Here is where he and I really part ways. My view would be that from the theological and philosophical standpoints, such intervention is, if anything, antecedently *improbable*. Plantinga builds his case by recalling that "according to Scripture, [God] has often intervened in the working of his cosmos" (Plantinga 1991a, 22). And the examples he gives are the miracles recounted in Scripture and the life, death, and resurrection of Jesus Christ. I want to recall here a set of old and valuable distinctions between nature and supernature, between the order of nature and the order of grace, between cosmic history and salvation history. The train of events linking Abraham to Christ is not to be considered an analog for God's relationship to creation generally. The Incarnation and what led up to it was unique in its manifestation of God's creative power and a loving concern for the created universe. To overcome the consequences of human freedom, a different sort of action on God's part was required, a transformative action culminating in the promise of resurrection for the children of God, something that (despite the immortality claims of the Greek philosophers) lies altogether outside the bounds of nature.

The story of salvation is a story about men and women, about the burden and the promise of being human. It is about free beings who sinned and who therefore *needed* God's intervention. Dealing with the human predicament "naturally," so to speak, would not have been sufficient on God's part. But no such argument can be used with regard to the origins of the first living cells or of plants and animals. The biblical account of God's dealings with humankind provides no warrant whatever for supposing that God would have brought the ancestors of the various kinds of plants and animals to be outside the ordinary order of nature. The story of salvation *does* bear on the origin of the first humans. If Plantinga were merely to say that God somehow leaned into cosmic history at the advent of the human, Scripture would clearly be on his side. How this "leaning" is to be interpreted is, of course, another matter.⁸ But his claim is a much stronger one. . . .

TOO MUCH AUTONOMY?

But what are we to make of Plantinga's objection that having life coming gradually to be according to the normal regularities of natural process is "semi-deistic," i.e., that it attributes too much autonomy to the natural world? He says:

God could have accomplished this creating in a thousand different ways. It was entirely within his power to create life in a way corresponding to the Grand Evolutionary scenario . . . to create matter . . . together with laws for its behavior, in such a way that the inevitable⁹ outcome of matter's working according to these laws would be first, life's coming into existence three or four billion years ago, and then the various higher forms of life, culminating as we like to think, in humankind. This is a semi-deistic view of God and his working. (Plantinga 1991a, 21)

He contrasts this alternative with the one he favors:

Perhaps these laws are *not* such that given enough time, life would automatically emerge. Perhaps he did something different and special in the creation of life. Perhaps he did something different and special in creating the various kinds of animals and plants (Plantinga 1991a, 22).

Plantinga's characterization of the first alternative as semideistic is intended to validate the second alternative as the appropriate one for the Christian to choose. But why should the first alternative be regarded as semideistic? He allows that it was within God's power to bring about cosmic evolution, but then asserts that to say God *did* in fact fashion the world in this way would be semideistic. This is puzzling. It would be semideistic, perhaps, if we *already* knew that God had intervened in bringing into existence some kinds of plants and animals, in which case the "grand evolutionary scenario" would attribute a greater degree of autonomy to the natural world than would be warranted. But this is exactly what we do *not* know. And to assume that we *do* know it would beg the question.

The problem may lie in the use of the label *semi-deistic*.¹⁰ A semideist, Plantinga remarks, could go so far as to allow that God "starts everything off" and "constantly sustains the world in existence" and could

even maintain that "any given causal transaction in the universe requires specific divine concurrent activity." All this would, apparently, not be enough to make such a view acceptable. What more could be needed? Defining God's relationship with the natural order in terms of creation, conservation, and *concursum*, has been standard, after all, among Christian theologians since the Middle Ages. Perhaps what still needs to be made explicit is that God *could* also, if God so chose, relate to the created world in a different way, either by way of special creation, or in the dramatic mode of a grace that overcomes nature and of wonders that draw attention to the covenant with Israel and ultimately to the person of Jesus. The possibility of such an "intrusion" on God's part into human history, of a mode of action that lies *beyond* nature, must not be excluded in advance, must indeed be affirmed. I take it that the denial that such a mode of action is possible on the part of the Being who creates and conserves and concurs is what constitutes semideism, in Plantinga's sense of that term.

But someone who asserts that the evolutionary account of origins is the best-supported *one* is *not* necessarily a semideist in this sense. Some defenders of evolution—notably those who deny the existence of a Creator and are, therefore, not deists of any sort—would, of course, exclude special creation in this way, in principle. But there is no intrinsic connection whatever between the claim that God did, in fact, choose to work through evolutionary means and the far stronger claim that God *could* not have done otherwise. Nor, of course, is there any reason why someone who defends the evolutionary account of origins should go on to deny that God might intervene in the later human story in the way that Christians believe God to have done.

In sum, then, at least *four* alternatives would have to be taken into account here. There are those who defend the evolutionary account of origins, and also rejecting the existence of God, would (if pressed) say that life could not *possibly* have come to be except through evolution. There may be those who maintain that God created, conserves, and concurs in the activity of the universe but *could* not "intervene" in a special way in its history to bring new kinds of animals and plants to be, for example. These (if they exist) are the semideists Plantinga describes. Then there are those who prefer the evolutionary account

of origins on the grounds of evidence that this is in fact most probably the way it happened, but who are perfectly willing to allow that it was within the Creator's power to speed up the story by special creation of ancestral kinds of plants and animals, even though (in their view) this was not what God did. This is a view that a great many Christians from Darwin's day to our own have defended; it is the view I am proposing here. It is *not* semideistic. And finally, there is the option of special creation: that God *did*, in fact, intervene by bringing various kinds of living things to be in a "special" way.

When Plantinga presents two alternatives only, the second being that God might "perhaps" have intervened as defenders of special creation believe occurred, he must be supposing that the other alternative, the "grand evolutionary scenario," is one that excludes such a "perhaps"; i.e., that excludes, *in principle*, the possibility that God could have intervened in a special way in the natural order. What I am challenging is this supposition. The Thesis of Common Ancestry can claim, as we have seen, an impressive body of evidence in its own right. It need not rely on, nor does it entail any in-principle claim about what God could or could not do.¹¹

CONCLUSION

So, finally, how *should* the Christian regard this thesis? Perhaps better, since there are evidently "distinctive threads in the tapestry of Christianity" in Plantinga's evocative metaphor (1991a, 30), how might someone respond who sees in the Christian doctrine of creation an affirmation of the integrity of the natural order? TCA implies a cousinship extending across the entire living world, the sort of coherence (as Leibniz once argued) that one might expect in the work of an all-powerful and all-wise Creator. The "seeds," in Augustine's happy metaphor, have been there from the beginning; the universe has in itself the capacity to become what God destined it to be from the beginning, as a human abode, and for all we know, much else.

When Augustine proposed a developmental cosmology long ago, there was little in the natural science of his day to support such a venture. Now that has changed. What was speculative and not quite coherent has been transformed, thanks to the labors of

countless workers in a variety of different scientific fields. TCA allows the Christian to fill out the metaphysics of creation in a way that (I am persuaded) Augustine and Aquinas would have welcomed. No longer need one suppose that God must have added plants here and animals there. Though God *could* have done so, the evidence is mounting that the resources of the original creation were sufficient for the generation of the successive orders of complexity that make up our world.

Thus, common ancestry gives a meaning to the history of life that it previously lacked. From another perspective, this history now appears as preparation. The uncountable species that flourished and vanished have left a trace of themselves in us. The vast stretches of evolutionary time no longer seem quite so terrifying. Scripture traces the preparation for the coming of Christ back through Abraham to Adam. Is it too fanciful to suggest that natural science now allows us to extend the story indefinitely farther back? When Christ took on human form, the DNA that made him son of Mary may have linked him to a more ancient heritage stretching far beyond Adam to the shallows of unimaginably ancient seas. And so, in the Incarnation, it would not have been just human nature that was joined to the Divine, but in a less direct but no less real sense all those myriad organisms that over the aeons had unknowingly shaped the way for the coming of humanity.¹²

Anthropocentric? But of course: The story of the Incarnation *is* anthropocentric. Reconcilable with the evolutionary story as that is told in terms of chance events and blind alleys? I believe so, but to argue it would require another essay. Unique? Quite possibly not: Other stories may be unfolding in very different ways in other parts of this capacious universe of ours. Terminal? Not necessarily: We have no idea what lies ahead for humankind. The transformations that made us what we are may not yet be ended. Antecedently probable from a Christian perspective? I will have to leave that to the reader.

NOTES

1. For the text of the judgment, "McLean vs. Arkansas," see Gilkey 1985, 266-301. The judgment is not itself without some logical difficulties; see Quinn 1984.

2. Plantinga's essay was featured in a special issue of *Christian Scholar's Review* 21 (1991), 8–32 (here 1991a). The issue carried critical responses by Howard Van Till (33–45), and myself (55–79), as well as a detailed reply by Plantinga (here 1991b). The present essay is a revised and considerably augmented version of my paper in that volume. I am grateful to Dr. Plantinga for our discussions of these issues, and for the characteristic care he took in responding to my original criticisms.
3. In defense of his usage, Plantinga notes that theology at an earlier time was called a science (1991b, 98). But this usage was recognized to be problematic from the Aristotelian viewpoint of that time. To the objection that theology cannot be regarded as a science because it proceeds from premises not admitted by all, Aquinas responds that because these premises are revealed by God, they can be accepted on authority, just as optics takes its principles from geometry (*Summa Theologica*, Vol. 1 q.1, a.2). But this does not really answer the objection adequately, since the revealed character of these premises is not admitted by all. And the Aristotelian distinction between what is better known to us and what is better known "in itself" will not do the work. When the Aristotelian conception of science (deduction from self-evident premises) was gradually abandoned in the seventeenth century, the new conceptions that succeeded it made the extension of the term *science* to theology even more problematic, particularly in the present context of the knowledge of nature.
4. Calling it God's "direct" action would leave matters ambiguous, since it could be said that God's action in sustaining the world in existence is direct action; this sort of action is, of course, not in dispute here. What makes God's "special" action inaccessible to the methods of natural science is that it lies, as medieval philosophers put it, "outside nature," outside the pattern of regularities that afford a foothold for later inquirers. The most that science could do where "special" action is claimed, as in the case of miracles, would be to exclude, as far as possible, alternative "natural" explanations. But when special creation is supposed to have occurred in the early history of life on earth, this (as we shall see) is *very* difficult to do.
5. This argument does not depend on an ability to draw a sharp demarcation between science and nonscience. Scientists often rely on principles of natural order of a broadly metaphysical sort, but these are in principle accessible to all; they are over the long run at least partially adjudicable in terms of the "success" (in a fairly specific sense) of the theories employing them. (See McMullin, 1993.) Reliance on Scripture is another matter entirely.
6. As an illustration of how Scripture could "correct current science," Plantinga remarks: "If, for example, current science were to return to the view that the world has no beginning, and is infinitely old, then current science would be wrong" (Plantinga 1991a, 14). I do not believe that Scripture *does* prescribe that the universe had a beginning in time, in some specific technical sense of the term *time*; the point of the creation narratives is the dependence of the world on God's creative act, to my mind, not that it all began at a finite time in the past. A world that has always existed would still (as Aquinas emphasized) require a creator. As an illustration of how complex the notion of temporal beginnings has become, the Hawking model of cosmic origins mentioned by Plantinga does not imply that the universe is infinitely old (as that phrase would ordinarily be understood), but rather that as we trace time backwards to the Big Bang, the normal concept of time may break down as we approach the initial singularity some 15 billion years ago. The history of "real time" (as Hawking calls it) would still be finite in the same terms as before, as he explicitly points out (Hawking 1988, 138). The question of whether or not the time elapsed in cosmic history is finite or infinite depends, in part, on the choice of physical process on which to base the time scale, particularly on whether it is cyclic or continuous. The question of the finitude or infinity of past time, so much debated by medieval philosophers and theologians, cannot straightforwardly be answered in absolute terms. The notion of time measurement is far more complex and theory-dependent than earlier discussions allowed. But the theological *point* of the biblical account of creation remains untouched by technical developments such as these (McMullin 1981, 35).
7. The exponents of physico-theology were not entirely sure how to classify their arguments from design concerning origins. These could not be directly tested in the normal empirical ways, but it did seem as though "naturalist" explanations could be systematically excluded.
8. "God fashioned Adam from the dust of the earth and breathed into his nostrils the breath of life" (Genesis 2:7). The "fashioning" here could be that of a billion years of evolutionary preparation of that "dust" to form beings that for the first time could freely affirm or freely deny their maker. Pope Pius XII in his encyclical *Humani Generis* (1950) allowed that such an evolutionary origin of the human

body was an acceptable reading of the Genesis text. But he added that the human *soul* could not be so understood; souls must be "immediately created" by God (1950, 181). The Platonic-sounding dualism underlying this distinction requires further scrutiny. The uniqueness of God's covenant with men and women and of the promise of resurrection does not require that there be a naturally immortal soul, distinct in its genesis and history from its "attendant" body. But it is unnecessary to develop this issue here, since Plantinga's challenge extends to the evolutionary account of the plant and animal worlds, not simply of the human alone.

9. *Inevitable* is a word that defenders of evolution, whether theists or not, would be inclined to challenge. It suggests that the evolutionary process is, at least in a general way, deterministic or predictable. But this is just what nearly all theorists of evolution would deny.
10. In the entry under *deism* in *The Encyclopedia of Religion*, Allen Wood remarks that the term *deism* tended over time to become "a vague term of abuse" when used by Christian writers with regard to hypotheses that in their view attributed an undue degree of autonomy to the universe.
11. There is one further perspective on this matter of semideism that I have set aside above. The occasionalists of the fourteenth century maintained that God is the *only* cause, strictly speaking, of what happens in the world. What appears to be causal action within the world is for them no more than temporal succession. Things do not have natures that specify their actions; rather, the fact that they act according to certain norms must be directly attributed to God's intentions. There is no reason in this view why God should not, for example, suddenly make new kinds of plants and animals appear, if God so wishes; since there is no order of *nature*, God is committed only to the reasonable stability of (more or less) regular succession on which human life depends. (The issue that separated the nominalists from the Aristotelian defenders of real causation in nature is brought out very well in the essay by Alfred Freddoso [1988] cited by Plantinga.) In this perspective, the issue of special creation comes to be posed in a quite different way. Any view which affirms the sufficiency of the natural order for bringing about the origins of life might be dubbed by the occasionalist as semideist. When I read the paragraph where Plantinga says that someone who maintains that God creates, conserves, and concurs in the activity of the universe

can still be semideistic, my first reaction was to assume that this committed him to occasionalism, since it would seem that it is *only* from the occasionalist perspective that this view of God's relationship with the natural order would be classed as semideist. But Plantinga is quite evidently not an occasionalist; his treatment of natural science implies that he believes in the operation of secondary causation in nature. Thus, I have assumed in the discussion above that he must have had something else in mind when speaking of semideism, namely, the openness of creation to the supernatural order of grace and miracle. Incidentally, the occasionalist *would* be likely to believe that special creation is antecedently more probable, and (in Berkeley's version, at least) might tend to question a theory, like the theory of evolution, which depends on the reality of such causes as genetic mutation.

12. Though the alert reader will have caught echoes of the theology (not the biology) of Teilhard de Chardin, the affinities with the Christology of Karl Rahner are, perhaps, more immediate. See, for example, Rahner 1961, 30.

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PETER ATKINS

Purposeless People

When confronted with the analysis of any concept, however complex, the only intellectually honest approach is to explore the extent to which an absolutely minimal explanation can account for the reliable evidence. There is no justification for departing from this procedure when the complex concept in question is that of the person, however deeply emotive it may be, and however much we may long for a reassuring outcome. Only if a minimal approach is explicitly demonstrated to be inadequate may there be some justification for indulging in the soft furnishings of additional hypotheses. We should begin our exploration, therefore, by asking whether the concept of person, which I take to be the concept of our individual existence, persistence, and role in this universe, can be explained without the sugar-coating of invented attributes of persons, additions that have been pro-

Persons and Personality, ed. A. Peacocke and G. Gillette (Oxford: Basil Blackwell, 1987) pp. 12-32. Reprinted by permission of the author.

posed by the under-informed or the wily perhaps, and have been adhered to generally by the religious.

We should ask whether the concept of personal existence can survive stripped-down explanations and their ramifications. Is there any support for the existence of something beyond the absolutely sparse? Is there life beyond bones? Are the fat and tallow of religious, philosophical, and psychological forms of justification necessary and not merely desirable? And if fat and tallow are found to be unnecessary, is there any justification for an ethical view amid the bones of people's purposelessness?

I will argue that it is intellectually dishonest at this stage of human development to resort to the artifice of supposing man's existence to be justified by recourse to something beyond this world. I will argue that the time is ripe for the faithful to relinquish their prejudices and to examine with an open mind the possibility that the world is a happy accident, that we might be creatures of chance, nothing more than fragments of highly organized matter, and that