

# When Faith and Reason Clash: Evolution and the Bible.

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**M**y 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 4 1/2 billion years old, but still hardly a spring chicken. Primitive life arose on earth perhaps 3 1/2 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 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.

But first, a quick gesture towards the history of our problem. Our specific problem-faith and evolution-has of course been with the church since Darwinian evolution started to achieve wide acceptance, a little more than a hundred years ago. And this question is only a special case of two more general questions, questions that the Christian Church has faced since its beginnings nearly two millennia ago: first, what shall we do when there appears to be a conflict between the deliverances of faith and the deliverances of reason? And another question, related but distinct: how shall we evaluate and react to the dominant teachings, the dominant intellectual motifs, the dominant commitments of the society in which we find ourselves? These two questions, not always clearly distinguished, dominate the writings of the early church fathers from the second century on.

Naturally enough, there have been a variety of responses. There is a temptation, first of all, to declare that there really can't be any conflict between faith and reason. The no-conflict view comes in two quite different versions. According to the first, there is no such thing as truth *simpliciter*, truth just as such: there is only truth from one or another perspective. An extreme version of this view is the medieval two-truth theory associated with Averroes and some of his followers: some of these thinkers apparently held that the same proposition can be true according to philosophy or reason, but false according to theology or faith; true as science but false as theology. Thinking hard about this view can easily induce vertigo: the idea, apparently, is that one ought to affirm and believe the proposition as science, but deny it as theology. How you are supposed to do that isn't clear. But the main problem is simply that truth isn't merely truth with respect to some standpoint. Indeed, any attempt to explain what *truth from a standpoint* might mean inevitably involves the notion of truth *simpliciter*.

A more contemporary version of this way of thinking-the truth-from-a-standpoint way of thinking-takes its inspiration from contemporary physics. To oversimplify shamelessly, there is a problem: light seems to display both the properties of a wave in a medium and also the properties of something that comes in particles. And of course the problem is that these properties are not like, say, *being green* and *being square*, which can easily be

exemplified by the same object; the problem is that it looks for all the world as if light *can't* be both a particle and a wave. According to Niels Bohr, the father of the Copenhagen interpretation of quantum mechanics, the solution is to be found in the idea of *complementarity*. We must recognize that there can be descriptions of the same object or phenomenon which are both true, and relevantly complete, but nonetheless such that we can't see how they could both hold. From one point of view light displays the particle set of properties; from another point of view, it displays the wave properties. We can't see how both these descriptions can be true, but in fact they are. Of course the theological application is obvious: there is the broadly scientific view of things, and the broadly religious view of things; both are perfectly acceptable, perfectly correct, even though they appear to contradict one another.<sup>1</sup> And the point of the doctrine is that we must learn to live with and love this situation.

But this view itself is not easy to learn to love. Is the idea that the properties in question *really are* inconsistent with each other, so that it isn't possible that the same thing have both sets of properties? Then clearly enough they *can't* both be correct descriptions of the matter, and the view is simply false. Is the idea instead that while the properties are *apparently* inconsistent, they aren't really inconsistent? Then the view might be correct, but wouldn't be much by way of a *view*, being instead nothing but a redescription of the problem.

Perhaps a more promising approach is by way of territorial division, like that until recently between East and West Germany, for instance. We assign some of the conceptual territory to faith and Scripture, and some of it to reason and science. Some questions fall within the jurisdiction of faith and Scripture; others within that of reason and science, but none within both. These questions, furthermore, are such that their answers can't conflict; they simply concern different aspects of the cosmos. Hence, so long as there is no illegal territorial encroachment, there will be no possibility of contradiction or incompatibility between the teachings of faith and those of science. Conflict arises only when there is trespass, violation of territorial integrity, by one side or the other. A limited version of this approach is espoused by our colleague Howard van Till in *The Fourth Day*. Science, he says, properly deals only with matters *internal* to the universe. It deals with the properties, behavior and history of the cosmos and the objects to be found therein; but it can tell us nothing about the *purpose* of the universe, or about its *significance*, or its *governance*, or its *status*; that territory has been reserved for Scripture. The Bible addresses itself only to questions of external relationships, relationships of the cosmos or the things it contains to things beyond it, such as God. Scripture deals with the status, origin, value, governance and purpose of the cosmos and the things it contains, but says nothing of their properties, behavior or history.

Now van Till means to limit these claims to the *prehistory* (i.e., history prior to the appearance of human beings) of the cosmos; he does not hold that science and Scripture cannot both speak on matter of *human* history, for example.<sup>2</sup> This means that his view doesn't give us a general approach to *prima facie* conflicts between science and Scripture; for it says nothing about such apparent conflicts that pertain to matters of human history, or to matters concerning how things have gone in the cosmos since the appearance of

human beings. Van Till limits his approval of this approach for very good reason; taken as a *general* claim, the contention that Scripture and science never speak on the same topic is obviously much too simple. First, there are many questions such that both science (taken broadly) and the Bible purport to answer them: for example, *Was there such a person as Abraham? Was Jesus Christ crucified? Has anyone ever caught fish in the Sea of Galilee? Do ax heads ever float?* Indeed, even if we restrict or limit the claim, in van Till's way, to the prehistory of the cosmos, we still find questions that both Scripture and science seem to answer: for example, *Has the cosmos existed for an infinite stretch of time?*

Further, it is of the first importance to see that when we remove that limitation (and here, of course, van Till would agree), then it isn't true at all that the Bible tells only about status, value, purpose, origin, and the like. It tells us about Abraham, for example, and not only about his status and purpose; it tells us he lived in a certain place, made the long journey from Ur to Canaan, had a wife Sarah who had a son when she was really much too old, proposed at one time to sacrifice Isaac in obedience to the Lord, and so on. Even more important, the Bible tells us about Jesus Christ, and not simply about his origin and significance. It *does* tell us about those things, and of course they are of absolutely crucial importance to its central message; but it also tells us much else about Christ. We learn what he did: he preached and taught, drew large crowds, performed miracles. It tells us that he was crucified, that he died, and that he rose from the dead. Some of the teachings most central to Scripture and to the Christian faith tell us of concrete historical events; they therefore tell us of the history and properties of things within the cosmos. Christ died and then rose again; this tells us much about some of the entities within the cosmos. It tells us something about the history, properties, and behavior of his body, for example: namely, that it was dead and then later on alive. It thus tells us that some of the things in the cosmos behaved very differently on *this* occasion from the way in which they *ordinarily* behave. The same goes, of course, for the Ascension of Christ, and for the many other miracles reported in Scripture.

So we can't start, I think, by declaring that the teachings of contemporary science cannot conflict with the deliverances of the faith; obviously they can. We can't sensibly decide in advance what topics Scripture can or does speak on: instead we must look and see. And in fact it speaks on an enormous variety of topics and questions—some having to do with origin, governance, status and the like, but many more having to do with what happened within the cosmos at a particular place and time, and hence with what also falls within the province of science. It speaks of history, of miracles, of communications from the Lord, of what people did and didn't do, of battles, healings, deaths, resurrections, and a thousand other things.

Let's look a little deeper. 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 know 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.<sup>3</sup> 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. 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.<sup>4</sup> 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 what 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."<sup>5</sup> 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.<sup>6</sup> 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 mistaken, 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.<sup>7</sup> 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 extremely 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.<sup>8</sup>

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."<sup>9</sup> (Let me recommend Dawkins' book to you: it is brilliantly written, unfailingly 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."<sup>10</sup> 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."<sup>11</sup>

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 nonliving 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."<sup>12</sup> 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 marshaled 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 These, 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.<sup>13</sup>

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 contradicting 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."<sup>14</sup> 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.<sup>15</sup> 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."<sup>16</sup> 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 behavior, 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.)<sup>17</sup> 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? That 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 .... <sup>18</sup>

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?<sup>19</sup>

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."<sup>20</sup> 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 probably 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 account 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 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."<sup>21</sup> 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.<sup>22</sup> And still more epicycles are required to account for puzzling discoveries in molecular biology during the last twenty years.<sup>23</sup> 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 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,-A<sub>n</sub> mutated (due to some perhaps unspecified cause), leading to some structural and functional change which was adaptively beneficial; the bearers of A,-A<sub>n</sub> thus had an advantage and came to dominate the population. Then genes B,-B<sub>n</sub> mutated in an individual or two, and the same thing happened again; then gene C,-C<sub>n</sub>.. 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 a 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, or course, *are* naturalists—Gould, Dawkins, and Stabbings, 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."<sup>24</sup> 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:<sup>25</sup> 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 natural 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 Avala, 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.

Judgements here, of course, may differ widely between believer 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 see the matter differently. The believer in God, unlike her naturalistic counterpart, is free to look at the evidence for the Grand Evolutionary Scheme and follows it where it leads, revising 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 Science," "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  $10^{300}$  with 300 zeros after it if there were that many of us the whole universe would be packed with us. 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 about 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 good thing for our scientists to point out some of these 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 rages in many areas of contemporary culture-the courts and in the so-called media-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 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 in 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

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 about God, and what we know by faith, by way of revelation, as well as know in other ways. In many areas, this means that Christians must rework 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 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 mentioned 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 course of 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 isolated 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

<sup>1</sup>Perhaps the shrewdest contemporary spokesman for this view is the late Donald MacKay in *The Clockwork Image. A Christian Perspective on Science* (London: Intervarsity Press, 1974) and "'Complementarity' in Scientific and Theological Thinking" in *Zygon*, Sept. 1974, pp. 225 ff.

<sup>2</sup>*The Fourth Day* (Grand Rapids: Wm. B. Eerdmans Publishing Co., 1986), p. 195.

<sup>3</sup> Ps. 104 vs. 5.

<sup>4</sup> See Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), pp. 115 ff.

<sup>5</sup> *Christian Observer* 1832, p. 437.

<sup>6</sup> Here the work of Bas van Fraassen is particularly instructive.

<sup>7</sup> As with the intuitionist and constructivist mathematics, idealistic interpretations of quantum mechanics, and Bell theoretical questions about information transfer violating relativistic constraints on velocity.

<sup>8</sup> Thus according to Anthony Flew, to suggest that there is real doubt about evolution is to corrupt the youth.

<sup>9</sup> Richard Dawkins, *The Blind Watchmaker* (London and New York: W. W. Norton and Co., 1986), pp. 6 and 7.

<sup>10</sup> Quoted in Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976), p. 1,

<sup>11</sup> *Darwinism Defended*, pp. 326-327.

<sup>12</sup> "Evolution as Fact and Theory" in *Hen's Teeth and Horse's Toes* (New York Norton, 1983).

<sup>13</sup> 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* (Further publication data on these books, if desired, is to be found in the bibliography). The authors of the first book believe that God created life specially, the authors of the others do not.

<sup>14</sup> "The Theory of Evolution: Recent Successes and Challenges," in *Evolution and Creation*, ed. Eman McMullin (Notre Dame: University of Notre Dame Press, 1985), p. 60.

<sup>15</sup> "Evolution as Fact and Theory" in *Hen's Teeth and Horse's Toes* (New York: W. W. Norton and Company, 1980), pp. 254-55.

<sup>16</sup> "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.

<sup>17</sup> 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).

<sup>18</sup> Op. cite.!. p. 257.

<sup>19</sup> Op. cit., pp. 258-259.

<sup>20</sup> Claude A. Vilee, 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.

<sup>21</sup> *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."

<sup>22</sup> ,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.

<sup>23</sup> Here see Michael Denton, *Evolution: A Theory in Crisis* (London: Burnet Books, 1985), chapter 12.

<sup>24</sup> *Op. Cit.*, p. 28.

<sup>25</sup> "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).

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