LITERATURE REVIEWS

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Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution. Kenneth Miller. 1999. NY: Cliff Street Books. 338 p. Cloth, $25.00; paper, $14.00.

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Kenneth Miller is a molecular biologist at Brown University who has long been involved in the creation-evolution controversy. He has vigorously defended Darwinian evolution, and yet is a Catholic, while most of his fellow Darwinists are agnostic if not atheist. In fact, he was cited in the recent PBS video documentary series "Evolution" as an example showing that religion, at least some religion, and Darwinism are not incompatible. *Finding Darwin's God* explains Miller's point of view on evolution, theism, and their relationship.

Miller makes it clear in the Introduction and Chapter 1 that he believes evolution to be the correct way to view the history of life on Earth, and also that he believes in God. He acknowledges that these ideas are not usually thought to be compatible, but intends to explain why he believes they are. First, however, he intends to make it clear why he thinks that evolution is correct.

In Chapter 2 Miller recounts some of the history of Darwin's theory. He readily admits that, like all scientific theories, it is not beyond theoretical question (see also p 130), but thinks that in practice it is extremely well confirmed, so that in the scientific world it might as well be fact. In one sense he states that evolution is a fact; the fossil record was laid down over long ages and organisms that existed long ago are related to organisms that exist today (sometimes called descent with modification; p 53-54). In another sense evolution is theory, as the precise mechanism (natural selection acting on random mutations) is not provable, but he states that this theory is as well established as atomic theory or germ theory (p 54). He does a good job disposing of the idea that because some object cannot be touched, or because some event occurred in the past,

we cannot study it scientifically. He also defends what he calls scientific materialism, or what is elsewhere called methodological naturalism, as the fundamental assumption of science. What he does not do is establish that methodological naturalism must be able to explain the entire universe. This point becomes important in two ways, which we will discuss later. First, Miller himself believes that some events are not explained by methodological naturalism. Second, he sometimes uses methodological naturalism against his creationist opponents.

Chapter 3 explains why Miller thinks that special creationists are wrong. Basically he believes that science can establish the age of Earth, of the universe, and of life on Earth, and that this age is incompatible with special creation. He relies heavily on radiometric dating. He acknowledges other dating methods, but believes them to have major flaws. His criticism of the use of volcanism and erosion to date the earth is correct. Volcanism and erosion are opposite processes, and cannot be used uncritically to date the age of Earth without consideration of each other, and other processes such as continental uplift. In other cases he is not quite as fair, as when he suggests that the mineral content of seawater cannot limit its age (p 64-65). For some minerals, such as aluminum, he is undoubtedly right. However, his hypothesis, that aluminum forms insoluble complexes and settles out, will only work for minerals that are at or near saturation in seawater. Sodium, and especially potassium, may still be useful in setting an upper limit for the age of the ocean, as they are nowhere near the saturation point in seawater.

Miller's treatment of radiometric dating is heavily dependent on Brent Dalrymple (p xiii). Miller's discussion of potassium-argon dating assumes that a given crystalline material "contains no initial argon" (p 68). This statement is demonstrably false for lava. Modern lava commonly has argon that matches the isotopic composition of air and therefore dates to zero using the standard formula, but practically all modern lava contains significant amounts of argon (see, e.g., Dalrymple 1969). The same holds true for synthetic muscovite (Karpinskaya 1967), and there is no reason to suspect that it is not true for biotite. Other minerals, such as sylvite, may be more likely to exclude argon, but they are somewhat of an embarrassment to evolutionists (see the discussion in Giem 1997, p 131-132).

The discussion of short-lived isotopes (p 69-72) is technically incorrect (not all Miller's "Yes-P" nuclides are produced as the result of decay series), but the point is still valid. Isotopes with a long half-life are found

on Earth, whereas isotopes with a shorter half-life are not found unless they are being produced by some other process. However, if either Earth (but not life on Earth) is old, or rapid decay occurred during creation and/or the Flood, one would also expect this pattern from a creationist standpoint.

When Miller discusses rubidium-strontium dating, he states (p 76), "However, no natural process exists that could produce overestimates of age that would pass the rigorous test of isochron analysis." In this he is simply wrong. Two-component mixing lines always precisely mimic isochrons, and it is nearly universally accepted that some "isochron" lines are in fact mixing lines (see Giem 1997, p 144-147). What is not clear is how many "isochron" lines are mixing lines. Speeding up radioactive decay could also explain radiometric dates, although Miller points out problems with this approach.

Finally, Miller criticizes the young-universe theory. Here is where many special creationists are perhaps most vulnerable to criticism. The "appearance of age" is theoretically possible, but scientifically completely unfruitful, whereas conventional cosmology is reasonably cohesive. However, there are other possible creationist solutions to the problem. Russell Humphreys (1994) has proposed one possible solution. Another one is that Genesis records only the creation of the solar system, or even only Earth's surface. If the scientific evidence for the age of life on Earth can reasonably be matched with the Genesis account, I do not see that the problem of the age of the universe should cause one to abandon special creationism.

Chapter 4 discusses multiple creations. Now that Miller thinks that he has established the age of life on Earth, he criticizes, on theological grounds, those creationists who believe in long ages for life on Earth. He notes imperfection, at least theoretical imperfection, in design in nature, and therefore postulates that any designer must be imperfect. Furthermore, the designer must not care about animal life, as he created multiple species, genera, classes, and even phyla, which went extinct after short geological periods, and were therefore wasted, at least from our point of view.

In addition, Miller insists that evolution is up to the job of creating new species, and therefore new genera, classes, and phyla (which does not necessarily follow). He notes that measures of evolutionary change in the present are 10,000 to 10,000,000 times as fast as was apparently the case in the fossil record. He points out that Gould and Eldridge

were evolutionists, and believes that they had successfully harmonized the fossil record with Darwinian theory. Miller may be right, although certainly Gould's and Eldridge's initial statements sound like they disagreed with Darwinian theory, and sudden appearance and stasis were historically more expected by creationists than by evolutionists. His interpretation also has difficulty with the Cambrian explosion, which he barely mentions in this context, without mentioning the problems it causes for him (p 127). He later mentions the Cambrian explosion on p 210-211, and again on p 240, this time in a context which shows that he recognizes the problem.

In my opinion, Miller's attack on Behe's concept of irreducible complexity (Chapter 5) fails. He agrees with Behe on the general principle: truly irreducible complexity (biochemical machines made up of several parts, all of which must be present for significant function) means that direct evolution is not possible (see p 133,143,161). And I agree with him that the cilium is not the best example of irreducible complexity, although he misrepresents Behe's argument. (Behe discusses the basic requirements for a structural protein, a linking protein, and a powering protein, not how many tubules one needs for motion of a cilium.) The other examples Miller gives, with the possible exception of blood clotting, are all examples where irreducible complexity does not exist, and in the case of the Krebs cycle, Behe (1996, p 62-65) had already explicitly noted that this was the case. Here Miller is setting up straw men. Behe's best example, the bacterial flagellum, Miller simply sidesteps (p 147-148), in my opinion unfairly (I have seen him, in a debate with Paul Nelson and William Dembski in Burbank, CA, on 21 June 2002, admit that the flagellum is a point for intelligent design advocates.) Miller's comments on the anatomy of the middle ear are irrelevant to the biochemistry of irreducible complexity (at least with our present knowledge), as Behe (1996, p 15-18) correctly noted in principle.

Miller does make one correct objection to Behe's synthesis. If God created life with all the DNA necessary for the major divisions of life, as Behe postulated, without continued Divine intervention how could the DNA have kept its integrity and not been destroyed by mutations during the presumed 3 billion years while it was silent and not under pressure from natural selection to stay intact? Miller's point is a good one.

But it seems to me that Miller is missing an important point. Behe's argument against undirected evolution may be true even if his personal

synthesis is wrong. Miller's frustration with Johnson may be at least partly misplaced for the same reason. Since Philip Johnson does not take a firm position, Miller is unable to attack Johnson's position. But Johnson's criticisms of undirected evolution may very well be valid even if Johnson does not present a specific substitute for undirected evolution that is theologically and scientifically coherent.

Later on Miller will again misstep while discussing Behe. On p 264 he states, "Michael Behe was correct to point out that Darwinian explanations of biochemical machines are rare, but his arguments require that they be absolutely non-existent." Of course this is not true. To disprove mechanistic evolution, Behe's argument requires only that Darwinian explanations of biochemical machines are truly nonexistent in one instance, although the more instances the stronger the argument. This condition is hard to establish, because we do not always know all of the possible explanations for a given phenomenon. But in theory, if naturalistic explanations of the universe are all that is needed, then there must be at least one naturalistic explanation for each and every event in nature.

In Chapter 6 (amplifying comments in Chapters 1 and 2), Miller notes that atheists try to use evolution to advance atheism. He identifies this linkage as the reason why there is such a negative reaction in some quarters to the theory of evolution. In this Miller is partly right (there are also scientific reasons). He documents the comments of several evolutionists who explicitly state that evolution implies atheism, and creationists who react to atheistic philosophy. He believes that the linkage between evolution and atheism is not valid.

In the rest of the book, Miller starts to create his own synthesis. He starts out with science. However, he rejects determinism, based mostly on quantum theory, with a little chaos theory thrown in (p 241). In fact, since quantum theory can influence genetics, he rejects determinism in the history of life, and hints that determinism is not sufficient to explain thought. He seems to indicate that God could act in quantum gaps (p 213), although he does not expand on that idea. He also argues for the existence of God from the Big Bang and the anthropic coincidences, although he is careful not to press the point too strongly. In fact, he seems to pull most of his punches when attacking atheists. Perhaps he is aware that his arguments for the existence of God are also "God of the gaps" arguments. Certainly he is aware that many, himself included, believe that a "God of the gaps" will eventually be unemployed. Perhaps

he should note that there are different kinds of "God of the gaps" arguments, some more valid than others because they are based on knowledge rather than ignorance.

The nearest I can sum up Miller's belief is the following: God created the universe, and God is continually active in the universe. The way God created life was by evolution. This allows life to be free, and not determined either by God or by initial conditions. It also absolves God of the direct responsibility for evil in this world (but only to the extent that God cannot interfere in nature).

Miller is "interested in a traditional view of God — the one described by the great Western monotheistic religions", not "something smart, modern, and sophisticated" (p 221). He also believes that the great Western religions have three principles in common (p 222). They are: 1) the primacy of God in the universe, 2) that we exist as the direct result of God's will, and 3) God has revealed Himself to us. The last principle prevents us from being deists (reinforced on p 216).

He believes in miracles. He notes (p 239), "Any God worthy of the name has to be capable of miracles," and, "Miracles, by definition, do not have to make scientific sense." Instead (p 240), "They reflect a greater reality, a spiritual reality, and they occur in a context that makes religious, not scientific, sense." That is, they are not irrational. They are just not mechanistic. He accepts such miracles as the Virgin Birth of Christ (p 239).

Miller would prefer to have a universe where God does not have to actively intervene in nature. His theology appears to be akin to that of Howard Van Till, whom Miller cites. He asks, through a quoted lecturer (p 283-284), which pool player is more impressive: one who cleans the table with fifteen shots, or one who takes one shot and sinks all fifteen balls? Miller obviously favors the latter.

This is not just an intellectual preference. Recall Miller's vigorous defense of evolution from its detractors, sometimes using straw men, and his tepid defense of theism. Put with that his pleased reaction when he found out his catechist, Father Murphy, was wrong; there is a naturalistic explanation for flowers (p 260-262). Note his admission that he did "my best to demolish the very idea" that "we were put here for a reason" (p 58, while acknowledging on p 233 that "all Western religions teach," presumably including his own, that "mankind is the *intentional* creation of God" [his italics]). Finally, note that he does not concede to Behe, at least temporarily, regarding the flagellum. One

gets the feeling that at least some of his arguments are not determined solely by the evidence, but have partly to do with his philosophical comfort zone and/or other factors.

There are three questions where Miller is not so clear. The first is whether quantum events are always truly random. As noted above, he hints that God can act in quantum events without violating the laws of nature. But if those events are always truly random, then to ascribe them to God is not necessary, or even meaningful, and God cannot guide the universe in any meaningful way. This brings up the second question. Can God violate the second law of thermodynamics? It is, after all, a statistical law. If He can, then such things as walking on water, feeding 5,000 people, or raising the dead are perfectly possible.

However, this also means that science, as usually understood, has its limits and cannot explain the entire universe. This will not make Miller's evolutionary colleagues happy. The fact that Miller believes in miracles (p 239-240) argues that he does believe in some kind of Divine intervention in nature, but in other places he seems to accept scientific materialism uncritically (e.g., p 14, 27-28), and use it against creationists. One of the important questions is whether God is capable of guiding evolution. If He is (as Miller hints He could be on p 241), then it is not necessary to explain all events as explainable by laws acting on random events. This implies that Darwinian evolution (*random* mutations and natural selection) should not be expected to be the only reason why we are here.

The third question is whether the origin of life can be explained on the basis of purely naturalistic causes. On this point Miller appears to be inconsistent, or at least unclear. Although he admits (p 276) that we do not have "a detailed, step-by-step account of the origin of life from non-living matter," he notes that this is true "only for the moment." He therefore cautions that "it would be foolish to pretend that religious faith must be predicated on the inability of science to cross such a line" (see also his comments on p 215, 262). Perhaps so. But if he can attempt to discredit creationists on the basis of fallible scientific constructs, such as radiometric dating, why can not mechanistic evolution receive the same treatment? Perhaps the argument would not be religious. But surely it could be scientific.

It is important to note that, in spite of his comments on simple and complex compounds, self-replicating RNA, and energy inputs, the gap between life and nonlife puts the flagellum to shame in terms of com-

plexity. There is no known resting point until one has a living cell. A Darwinian explanation would require thousands if not millions of such self-replicating assemblies, each slightly more reproductively fit than the last, at least in some circumstances. In addition, there is the question of the origin of the information content of the cell. This raises the question whether it is proper to greet evolutionary scenarios of the cell with the same skepticism with which we react to purported perpetual motion machines.

Miller appears to get cold feet on pressing this point. For he goes on to say, "Evolution, after all, does not require that life must have originated from naturalistic causes...." In fact, **atheistic** evolution **does** require that life must have originated from naturalistic causes. The only reason why he would make this statement would appear to be to insulate his personal theory from the possibility that the origin of life is in fact not explainable by natural causes. In fact, the most straightforward way of interpreting his final comments is that he believes in a "Creator" who "breathed" "life" into "a few forms or into one" (p 292, quoting Darwin). At least this is what Miller appears to mean when he says, "I believe in Darwin's God." (One may note that Darwin himself appeared to sit on the fence regarding this question, sometimes suggesting a Creator as the origin of life, sometimes suggesting a warm little pond with ammonium and phosphoric salts and electricity.)

The answer to the question of the origin of life is critical. If Miller concedes that the origin of life is not likely to be explained by random processes (note: *not* random mutations) plus natural laws, then his naturalistic friends will forsake him. Furthermore, he will have to give up any idea of a functionally complete universe. For if life is a miracle, his God also intervened in natural history and did not sink all the billiard balls with one shot, so to speak. It took Him at least two. In that case Miller should be more careful of criticizing those who believe in more than two shots, or continuous guidance, or even one recent shot.

However, if Miller chooses to insist that God did not interfere with the universe once He got it started, then Miller has a theological problem. For in that case, how can he believe in miracles in the historical past or the present? The theology of a functionally complete universe has no room for God's intervention in His creation in any way since the Big Bang. If God intervened in the ovum that eventually produced Jesus, then God has intervened in the physical world. If God answers prayer or performs miracles (see p 223), then God intervened in history. Then

one might expect God to also intervene in nature, and nature might not be complete without God's intervention. Miller calls creationists "the true deists" (p 218). But most creationists also believe in the intermittent or continuous intervention of God in His creation. In fact, unless Miller believes in God's special intervention in nature and/or history, he is in practice a true deist. And as he noted (p 216), deism is incompatible with the great Western religions, including Catholicism.

Either God "interferes" in nature, or He does not. You can't have it both ways. If He does interfere, then creationists are not out of line, at least in principle (as Miller admits on p 240). If He does not interfere, then not only are creationists out of line, but also believers in the Virgin Birth, the Resurrection of Jesus, the infallibility of the pope, Mohammed's authority, or that of the 10 commandments.

Some relatively minor observations are in order. It is inconsistent to insist that Genesis is "scientifically incorrect" (p 254) and still insist that "Genesis 1:26 tells us" (p 275) anything reliable. What Genesis 1:26 says may be true, but it is not valid to argue that way; if Genesis is not basically accurate the text is at best a lucky guess. Miller also argues that the early Church Fathers were not Biblical literalists (p 255-256). This is demonstrably wrong (Rose 2000). Augustine, the one example he cites, is the odd man out. In fact, Augustine uses his non-literal understanding to argue, not for long ages, but for an instantaneous creation as opposed to one in six days (Wells 1998). None of the early Fathers believed in evolution remotely resembling the modern sense.

On p 284-285, Miller expertly defends religion against those who would explain it away using evolutionary psychology. His defense is good, and can even be sharpened. If mechanistic evolution were true, we should never know it. Postmodernism is the logical product of an evolutionary psychology. This is certainly not where Miller wishes to go, or most scientists, for that matter.

It is reasonable to ask if Miller's Catholicism is a dumbed-down version with minimal content. Apparently not. He apparently believes in miracles, the Virgin Birth, a literal hell (p 291), and transubstantiation (p 223). Since Pope John Paul II has accepted evolution as scientific fact, I have no reason to suspect that Miller is not orthodox Catholic. However, this should give him some insight into Behe's motivation. Behe, also being Catholic, has no more religious need to challenge the adequacy of evolution than Miller does. Behe's motivation (and perhaps that of others) is that the science won't fit. He should not be put off as

religiously biased. Perhaps Miller should reconsider the scientific evidence.

To summarize the book, Miller makes a valiant attempt to defend Darwinian evolution as the sole cause of the vast variety of life on Earth, and at the same time to defend traditional monotheism. He does not quite succeed. His arguments against short-age creationists are scientifically flawed, and his defense against irreducible complexity, although ingenious, ultimately fails. He prefers to view the universe as having functional integrity, similar to the view of Van Till. However, Miller fails to explain the origin of life itself from natural causes, a necessary part of the functional integrity argument. He also fails to explain how the idea of functional integrity can be compatible with miracles in the historical past or present (which, after all, are a part of our universe). Miller faces a choice. Either he needs to go all the way with functional integrity, argue with atheistic evolutionists for a naturalistic origin of life, and jettison miracles and traditional monotheism, or else he needs to admit that the universe is not functionally complete without God. In that case he can keep miracles and traditional monotheism, and need not have a naturalistic explanation for the origin of life. He will then probably adopt some form of creationism. But he needs to decide whether to be an orthodox Catholic believer, or a believer in God's nonintervention in the universe. He can't have it both ways.

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