Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution, Kenneth R. Miller (Cliff St. Books, HarperCollins, 1999) (read winter 2012)

The author, a cell biologist and professor of biology at Brown University, quotes Charles Darwin as saying that true knowledge can be found "in the book of God's word, or in the book of God's works," and Professor Miller says he wrote this book to validate that point. (Preface, p. xii). He says his book is about the ultimate "Where are you from?" question, or "Who made us?" (p. 1) Stating it another way, he says, "The question is whether or not God and evolution can coexist." (p. 3)

Miller summarizes the "four building blocks" of Darwin's theory as (2) domesticated plants and animals show a tremendous range of variation, which breeders draw upon to create new varieties of plants and animals; (2) a similar range of variation exists in nature among wild species, which is illustrated by the fact that naturalists were always arguing about whether the individuals of a widely dispersed type were one species or two; (3) all living things are engaged in a struggle for existence, because there are not enough resources for all offspring of all plants and animals to survive; and (4) those that survive are likely to be those variations in each species with the strongest traits for survival; consequently their offspring, and not those of weaker variations, live on to constitute the next generation. (pp. 7-9) In a more pithy summary, he says evolution is a "three-part mechanism: Mutation, variation, and natural selection." (p. 51)

Asking whether we can be absolutely certain of evolution, Miller says, "In the strictest sense, no. Scientific knowledge, in the absolute sense, is always tentative. Science is founded on the proposition that everything we think we know about the natural world can, in principle, be rejected if it does not meet the test of observation and experiment." (p. 21) He acknowledges that "there is an assumption woven into the heart of the scientific method," which he calls "scientific materialism." (p. 27)

"Scientific materialism assumes that the objects and events of the natural world can be explained in terms of their natural properties." (p. 27) For example, the properties of the sun, which cannot be observed directly, can be explained by what we can find in the sun's radiation, which does reach us. An equally valid assumption might be that light from the sun is simply a miracle, but ultimately that explanation, says Miller, negates science itself. (p. 28)

In arguing that the conflict between the biblical creation story in Genesis and evolution, although real, is resolvable, Miller notes that for thousands of years humans thought the earth was the center of the universe, and that the sun and moon revolved around a human center, with the stars as "decoration on a distant ceiling of the nighttime sky." (p. 55) We have long since come to accept the scientific view that "we inhabit a small planet that moves around a smaller-than-average star, occupying a peripheral position on a nondescript galaxy in the vastness of space." (p. 55) Why then don't we abandon the view that God brought our species and all others abruptly into existence by his direct action? He says it is "high time that we grew up and left the Garden [of Eden]." (p. 56)

My answer is that Scriptural support for a God who directly created everything is much stronger than its support for a geocentric universe, which mostly relies on poetic descriptions in the Bible, such as that of the sun as a warrior who gets up in the morning and races across the sky from east to west. So it comes down to the authority of the Bible; if it is just a book of myths, then of course there is

no obstacle to believers accepting the total theory of evolution. (Miller says evolution is both a "theory" and a "fact"; p. 54)

Beginning with chapter 3, entitled "God the Charlatan," Miller examines three anti-evolutionary viewpoints: (1) "young earth" creationism, which believes that the earth is less than 10,000 years old and that the fossil record that apparently shows evolution at work is really a result of Noah's flood leaving layers of fossil-embedded sedimentation; (2) attacks on the fossil record to show that it does not document how evolution actually took place; and (3) "intelligent design," which argues that evolution cannot account for the biochemical machinery of the living cell and thus God must have designed it.

Chapter 3 provides detailed evidence that, in my opinion, effectively demolishes "young earth" creationism, exemplified by Henry Morris, founder of the Institute for Creation Research. The explanations from geology were more complex than I could follow, but Miller's conclusion to this chapter makes a very good point. He says that in view of the irrefutable evidence that the universe is billions of years old, the sad thing about the notion that it is not more than 10,000 years old is that it makes God into "a schemer, a trickster, even a charlatan. ... who intentionally plants misleading clues beneath our feet and in the heavens themselves. ... In other words, their God has negated science by rigging the universe with fiction and deception. To embrace that God, we must reject science and worship deception itself." (p. 80)

In Chapter 4, "God the Magician," Miller attacks "intelligent design" and one of its main proponents, Phillip Johnson, who wrote *Darwin on Trial*. The development that gave rise to the current interest in intelligent design, according to Miller, was the discovery (or promotion) of the concept of "punctuated equilibrium" by scientist Stephen Jay Gould and Niles Eldredge, which basically means that rather than showing a smooth gradual development of species, the fossil record shows millions of years of equilibrium, or stasis, followed by brief periods of rapid change. That is claimed to indicate the hand of a designer.

The problem with this, says Miller, is that when you apply that idea across the board, it reveals not a master designer who creates perfect species, but a designer whose work has "a host of flaws and imperfections," (p. 101) and whose designs are not good enough to survive (since "ninety-nine percent of his creations have become extinct" (p. 102). He gives two examples. First, the fact that species found on two isolated groups of islands, Cape Verde, off the coast of Africa, and the Galapagos, off the western coast of South America, are unique to those islands, and yet bear striking resemblances to species found on the nearest mainland (Africa and South America, respectively). (pp. 93-94) His other example is the two modern species of the elephant, for which the fossil record shows an ancestry of 22 distinct, but now extinct, species in the last six million years. (pp. 94-97) Is there really a designer who "over time, ... crafted scores of new species, his designs gradually drifting closer and closer to the modern elephant?" (p. 97)

As I understand his argument, Miller says that if intelligent design is true, then it must, to be at all rational, be applied to every species documented in the fossil record, which makes sense to me. He also says that, if evolution is not true, there must be some rational explanation for the "host of flaws and imperfections" in our bodies (p. 101) and also for the great number of transitional forms, like

fish-like features in the first amphibian-like tetrapods, found in the fossil record. Was the Creator both inept and deceptive, leaving the world strewn with misleading clues?

These are questions I cannot answer. However, it seems to me that Miller, while mocking Phillip Johnson, does some of what he criticizes Johnson for, just knocking holes in Johnson's argument instead of answering all the questions he raises. (To be fair, some of his mocking or derision may be due to his effort to make the book readable for lay readers.) For example, if punctuated equilibrium is true, what is the explanation for "millions of years of stasis" – why is evolution put on pause? And why does Miller say, "The appearance of new species out of thin air doesn't seem to happen anymore"? (p. 100) How can you possibly tell that until at least a few hundred thousand years have gone by?

Chapter 5, "God the Mechanic," is devoted to refuting another critic of evolution, Michael Behe, a professor of biochemistry at Lehigh University, who claims that "irreducibly complex systems *cannot* be produced by evolution." (p. 132, emphasis by author) The idea here is that some biological mechanisms are so complex, they cannot have evolved because if you take away one part, they don't work, and natural selection cannot function to produce inoperable parts. The classic example is the eye, which needs the lens, retina, iris, optic nerve, and many other parts to function. Why would parts of the eye that are useless by themselves ever evolve and come together to form an eye?

Miller's answer is that evolution can produce the eye, for example, because "biologists have realized that any ability, no matter how slight, to sense light would have had adaptive value." (p. 136) In other words, just because a component of a complex biological organ is useless when separated from the organ, that doesn't mean it didn't evolve to serve *some* useful purpose, even one entirely unrelated to the final complex organ.

Focusing on tiny biochemical mechanisms, Miller shows that while all the complex mechanisms in biochemistry have not yet been fully understood or explained in evolutionary terms, there is plenty of evidence that, in fact, "[e]volution assembles complex biochemical machines ... from smaller working assemblies that are adapted to fit novel functions. The multiple parts of complex biochemical machines are themselves assembled from smaller, working machines developed by natural selection." (p. 150)

This is not entirely convincing to me, although it is persuasive and perhaps if I had a better understanding of the science involved I would be more impressed. But it's difficult to see a lot of difference, sometimes, between "apparent design" in nature and the "could-have-happened-this-way" explanations of evolution. It seems to me there is a built-in bias there against design, although no doubt there is also a built-in bias against evolution on the part of those who believe creation was designed.

The second half of the book, chapters 6 through 9, explain the author's reasons for widespread public rejection of evolution and his ideas for reconciling evolution with religion.

He notes that in the late 1990s, the National Academy of Sciences published a ringing endorsement of evolution and embarked on a program to "update public understanding" of the issue. Miller

agrees wholeheartedly with the Academy's view of evolution, but disagrees that education is the way to enlighten the public. He writes:

> In a subtle way, the National Academy misread the issue, because public acceptance of evolution – or any other scientific idea – doesn't turn on the logical weight of carefully considered scientific issues. It hinges instead on the *complete* effect that acceptance of an idea, a world view, a scientific principle, has on their own lives and *their* vew of life itself. (p. 167, emphasis by author).

After talking with creationist Henry Morris, Miller grasped an important insight: "the appeal of creationism is emotional, not scientific." (p. 173) That would seem to me to apply to many areas where Christians seemingly hold illogical or inconsistent beliefs (like the argument to evangelicals about loving homosexuals, welcoming immigrants, and opposing the use of military force). It confirms the saying, "My mind is made up; don't confuse me with facts."

However, Miller shows that scientists, too, often have that prior philosophical commitment that can make contrary facts irrelevant. In a very interesting section, just three pages long, entitled "The Fabric of Disbelief," he writes that although western intellectual life is "tolerant almost by reflex," nevertheless the core beliefs of many scientists "do not allow them to accept religion as the intellectual equal of a well-informed atheistic materialism." (pp. 184-185) He quotes the Harvard geneticist Richard Lewontin, who says those in the scientific community have "a prior commitment, a commitment to materialism. As he explains:

> It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our *a priori* adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door. (p. 186)

All this is a tremendous challenge for believers, and Miller – who says he is one of them – now proceeds to show how one can believe in evolution and also believe in God. He argues that to creationists the real threat of evolution is not that it challenges their belief in divine creation, but that it teaches the lesson that life is fundamentally purposeless. "Without purpose to the universe, there is no meaning, there are no absolutes, and there is no reason for existence." (p. 187) He disagrees that this is true, and says at least part of the blame for the opposition to evolution is on the evolutionists who apply the *biological* concept of evolution to the soft sciences, like sociology and psychology. As he explains,

> The backlash to evolution is a natural reaction to the ways in which evolution's most eloquent advocates have handled Darwin's great idea, distilling from the raw materials of biology an acid of hostility to anything and everything spiritual. (p. 189)

His starting point is the theory of quantum mechanics, which leads to the "uncertainty principle" – that science cannot determine everything about subatomic particles, like electrons. The reason is ap-

parently because science has conclusively proved that light, for example, is both a *wave* (a steady stream of electrons that can be diffracted so that it spreads out like a wave on the surface of a pond) and a *particle* (a stream of tiny separate packets of photons). Under classical physics, that does not make sense, since it means that events are not governed by fixed laws, but rather at the quantum level, there is a built-in randomness that cannot be predicted. The world seems orderly and predictable because at a human-scale level the randomness of individual atoms or electrons evens itself out, so we don't notice the stray movements of some of them. (That's my understanding, anyway; see pp. 198-204)

Miller says opponents of evolution confuse "random" with "indeterminate." If everything were truly random, any result would be possible; all outcomes have equal probabilities, like a good shuffling of a deck of cards. But nature is actually indeterminate, which means that events follow understandable statistical patterns; electrons – and therefore all larger events, like human life – can move in a certain range of ways, and we cannot tell in advance where they will end up, but that range is not unlimited; some possibilities are so remote that they can be considered impossible. (pp. 212-213)

In other words, there is a boundary set by the nature of quantum physics around our ability to understand nature. Miller suggests that this boundary "was the necessary handiwork of a Creator who fashioned it to allow us the freedom and independence necessary to make our acceptance or rejection of His love a genuinely free choice." (p. 213) His conclusion: "In the final analysis, absolute materialism does not triumph because it cannot fully explain the nature of reality." (p. 219)

In a brief section entitled "Deism, Real and Imagined," Miller argues that anti-evolutionists are the true deists, because they accept a scientific, materialist explanation for life *today* – for example, that a single fertilized egg cell contains the full and complex set of instructions to transform itself into a complex multicellular organism – but are unwilling to accept the same kind of explanation historically. They insist that evolution cannot account for the development of life originally, since God is the true explanation. Thus they believe, like classic deists, that God acted to start things off but then let his clockwork creation unfold. "What this means, in plain and simple terms, is that ordinary processes, rooted in the genuine materialism of science, ought to be sufficient to allow for God's work – yesterday, today, and tomorrow." (pp. 214-218)

Whoa, sorry, Professor Miller, but you lost me there. This does not make sense to me. If I accept everything that science, particularly biology, tells me about life today, but believe that God originally created life, and intervened through history in many and various ways (like through the miracles recorded in the Bible), how does that make me a deist? He writes, "If God is real, *this* is the world He has to work in." (p. 218, emphasis by author) Well, no, this world is only a tiny fraction of what God has created, and He is not limited in the slightest to this world, nor does he have to conform to the scientific laws that govern this world.

My illustration would be to think of a kind of pinball machine containing a bunch of ping pong balls that are continuously punched upward and fall back down. Most of them land on spring-like disks that bounce them upward again. However, there are a couple of holes in the bottom, amidst the little discs, that are just big enough for an occasional ball to fall through. Although the force exerted by the discs, the bounciness of the balls, and other factors might theoretically be measured, I think, for

practical purposes, that this describes a truly random process, in which no one could predict which balls would fall through the holes. This is what I understand evolution to be like.

However, suppose I, looking down at all these bouncing balls, reach out and deflect one so that instead of hitting a springy disc and bouncing upward again, it falls through a hole. The rest of the balls keep bouncing around. Now the process is still truly random, except for the occasional outside interference. To some little observer on a level with the bouncing balls, who could not see me standing outside the machine, the outside interference could not be detected, and he or she would go on blissfully believing there's no one out there who makes a difference to these bouncing ping pong balls. Why isn't it like that with God and human life on earth?

In the chapter entitled "The Road Back Home," Miller notes that it is possible to have weak and pale forms of scientific "religion" (like "God is the laws of nature") that "dilute religion to the point of meaninglessness." But that is not what he embraces:

> Such "Gods" aren't God at all – they are just clever and disingenuous restatements of empirical science contrived to wrap an appearance of religion around them, and they have neither religious nor scientific significance. (p. 221)

Instead he focuses on what the "three great Western religions" share in common: (1) the primacy of a genuine, personal, eternal God who created the universe and everything within it by his will; (2) the existence of humans who are God's intentional creations, endowed with physical bodies but immortal, spiritual souls, and with free will so that we can choose good or evil, to love God or reject him; and (3) the belief that God has revealed Himself ("through the prophets, or by the words of Jesus, or through Muhammad") and continues to reveal himself by direct, personal contact with individuals of faith. (p. 222)

Miller points out that the physical structure of the universe points to (but does not, of course, prove) the existence of God. For example, the value of the gravitational constant is just right for the existence of life. "A little bigger, and the universe would have collapsed before we could evolve; a little smaller, and the planet upon which we stand would never have formed." (p. 228) The same is true of electromagnetism, another fundamental force. This perfect calibration of fundamental physical laws necessary to produce life is called the "anthropic principle:" "The physical constants of the universe in which we live *have to be* favorable to human life, because if they were not, nobody would be around to observe them." (p. 228) This sounds tautological to me.

When Miller attempts to reconcile the idea of "chance" with "God's will," he loses me. He points out that if God "rigged" everything, there would be no free will, and God could be blamed for everything that goes wrong in the world. But he says, "chance events are genuine because the physical world has an existence independent of God's will." (p. 234) Then he seems to slide into an argument that God's ways are just too deep for any human to understand, but we can still believe that He has a plan and is working out his will in our lives. Huh?

One of my main questions is how miracles can occur if everything came about through evolution. Miller answers that, in a sense, by saying, well, that's separate from science:

> What can science say about a miracle? Nothing. By definition, the miraculous is beyond explanation, beyond our understanding, beyond science. This does not mean that miracles do not occur. A key doctrine in my own faith is that Jesus was born of a virgin, even though it makes no scientific sense – there is the matter of Jesus's Y-chromosome to account for. But that is the point. Miracles, by definition, do not have to make scientific sense. They are specific acts of God, designed in most cases to get a message across. Their very rarity is what makes them remarkable. (pp. 239-240)

He goes on to suggest a number of ways that God can subtly influence the course of history, as well as our own individual lives (sometimes in response to our prayers), without our having a clue, but He acts in ways that preserve our own freedom, so that in general we reap the rewards and consequences of our own free will. (pp. 240-243)

How could God bring into existence creatures with a free will – free to love Him, free to reject Him – in a world governed by natural laws? Miller says the answer is in the theory, or fact, of quantum indeterminacy:

> His solution was to fashion a material universe in which the conditions of precise determinism do not apply. On the larger scale, He made the averaged behavior of matter sensible and predictable, making it possible to construct organisms and environments that work according to natural laws, which His creatures were sure to discover. Then He ensured that the behavior of the material fine structure of the universe was inherently unpredictable due to the multiple effects of quantum indeterminacy. This would allow His creatures to develop a science that applies to large-scale interactions, but one that is forever forbidden from grasping the detailed behavior of the units from which the material world is fashioned. (p. 251)

What does evolution have to do with this? In a paragraph I don't completely understand, Miller writes,

> By choosing evolution as His way to fashion the living world, He emphasized our material nature and our unity with other forms of life. He made the world today contingent upon the events of the past. He made our choices matter, our actions genuine, our lives important. In the final analysis, He used evolution as the tool to set us free. (p. 253)

In an extremely important discussion about Genesis and evolution, Miller openly confesses his own faith as a Christian Although this sounds paradoxical, he writes,

> As a scientist, I know very well that the earth is billions of years old and that the appearance of living organisms was not sudden, but gradual. As a Christian, I believe that Genesis is a true account of the way in which God's relationship with the world was formed. And as a human being, I find value in both descriptions. (p. 257)

Not sure about that last sentence, but clearly in the first two sentences Miller totally embraces both biblical Christianity and evolution. The key is how the Bible is to be interpreted, and here I don't think Miller is very helpful. He believes, of course, that the first two chapters of Genesis are not lit-

eral descriptions of how God created everything. But does that mean there is nothing *factual* about those chapters except what is consistent with evolution? He points out that the account of the creation of humans is quite different in chapters one and two. (pp. 256-257) But he does not discuss the fact that in each chapter (and, in fact, throughout the Bible), humans are said to be created separately from the creation of other animate life. Nowhere, to my knowledge, does Genesis or any other book of the Bible even intimate that humans were merely the next step in the evolutionary development of the most advanced non-human primates.

To support his interpretation of Genesis, Miller cites Augustine, especially his book *The Literal Meaning of Genesis*, and Howard Van Till, an evangelical professor of physics at Calvin College. (pp. 255-258) Miller's conclusion is that, "By any standard, Gods work in creating the universe amounts – literally – to a command that the earth and its waters bring forth life." (p. 257)

I agree with his view that, contrary to the view of atheistic scientists, "To a believer, the world makes sense, human actions have a certain value, and there is a moral order to the universe." (p. 258) But even though I agree with the sentiment, I do not understand the reasoning behind this statement:

> By recognizing the continuing force of evolution, a religious person acknowledges that God is every bit as creative in the present as He was in the past. That – and not a rejection of any of the core ideas of evolution – is why I am a believer. (p. 258)

How is God creative *in the present* if everything is unfolding out of a brilliant divine plan of using random selection as his means of creating everything from the first atom to human beings? Of course, Miller allows (I think) that God can intervene in the world directly, but that is quite different from saying that He is presently creating by means of evolution. Rather, it seems to me that it is only by *interfering* with evolution that God presently creates anything.

Did God create the daffodil? Miller's parish priest told him and others in his communicants class that only God can make a flower. Then many years later Miller was at a scientific lecture and heard a plant scientist explain how plants make flowers. (pp. 260-261) Miller uses this illustration to explain that just as we don't believe that God makes each flower bloom, so He does not make each human being or even the human specie, or any of the species of life. "Life, in all its glory, is based on the physical reality of the natural world. We are dust, and from that dust come the molecules of life to make both flowers and the dreamers who contemplate them." (p. 266)

He says, "There is neither logical nor theological basis for excluding God's use of natural processes to originate species, ourselves included." (p. 267) Well, how about God's revealed word? Doesn't it say pretty clearly that God created plants and animals and then in a second, discrete step, created humans? Miller does not address this.

Miller challenges his atheistic colleagues who say that the lesson to be learned from evolution is that life, including human life, has no purpose. He says this conclusion is beyond the realm of science, and that it is just as reasonable for him to claim that on the basis of science he had concluded that there is a purpose to life. (p. 269) On the other hand, also he criticizes a "simplistic reading of Genesis" and says it plays right into the hands of "the agents of disbelief," because, in effect, it treats Gen-

esis as a scientific document, which is easy to disprove and even ridicule. (p. 270)

The common belief of Christians (including me) that we humans are the pinnacle of God's creation is not true, says Miller, even if we concede that God used evolution to produce us. Essentially, he says that with evolution there were so many possible outcomes, and so many possible dead ends, that

> mankind's appearance on this planet was *not* preordained, that we are here not as the products of an inevitable procession of evolutionary success, but as an afterthought, a minor detail, a happenstance in a story that might just as well have left us out. (p. 272; emphasis by author)

Doesn't this presume God's inability to intervene to tweak the process, so that every possible thwarting of the evolutionary line leading to humans was avoided? That's what Miller seems to be saying. However, he has another answer that he believes overcomes this problem.

He says that even though "the explosive diversification of life on this planet was an unpredictable and historically contingent process," this does not mean that intelligent life would not be produced by evolution. All it means is that the chain that looked like it might lead to intelligent life was cut off. He says, "After 4.5 billion years, can we be sure He wouldn't have been happy to wait a few million longer?" for such life to appear? Then he adds,

> The vastness of the universe itself gives a hint that this was exactly God's approach. If a Creator were to fashion a world in which the constants of matter and energy made the evolution of life *possible*, then by forming millions of galaxies and billions of stars with planets, he would have made its appearance *certain*. (pp. 273-275; emphasis by author)

This does make sense to me, but he still hasn't, in my opinion, dealt with the question of that authority of Scripture. He admits that Genesis 1:26 assures us that "our hearts and minds are fashioned in the likeness of God," but if that's true, what about its factual assertions? Can we dismiss them all by just saying it is not a textbook of science?

In a section entitled "Amazing Grace," Miller says, "To a believer, grace is as real as the presence of God Himself" and "To a believer, grace is a gift from God that enables us to place our lives in their proper context – not by denying our biological heritage, but by using it in His service." (p. 280) Since in the same paragraph he recognizes "our fears, our desires, our jealousies," apparently he sees grace as something God gives us to enable us to choose not to yield to this negative passions, but to choose to serve God.

One of the sticking points for me is the idea that even life itself, at its tiniest level, was not, according to Miller's view of evolution, a direct creative act of God, but rather life evolved from inanimate matter. (p. 276) I find this difficult to accept, but it seems to me there are two possible sources of this difficulty. First, I am unable to comprehend, based on a lifetime of recognizing what seems to clearly to be a basic distinction between *inanimate things* and *plant and animal life*, how non-living matter can become alive without any external action. Second, I cannot square that kind of creation with *any* of the salient points of Genesis. The idea that God just created a material universe, with

certain physical constants, and let it roll, does not seem remotely compatible with the separate stages of creation described in Genesis.

That Kenneth Miller is deeply committed to his faith is made clear by his cogent rebuttals to the claims of atheistic scientists that religious faith is just a by-product of evolution that will fade away when people understand this. Thus he takes on biologist Edward O. Wilson ("On Human Nature") and cognitive scientist Steven Pinker, pointing out that the logic underlying their view that faith is just a product of evolutionary forces can just as well be applied to their views; i.e., that lack of faith or a predisposition to atheism is also just result of evolution. (pp. 284-285) He writes,

> It is a wonderful strategy to claim that you have found a scientific reason to explain why the other guy believes what he does (*he's* the prisoner of biology, of course), and slickly declare that your own beliefs rise above such impediments. (p. 285; emphasis by author)

The book ends with a testament of faith, sort of. (pp. 285-292) Professor Miller cites the views of atheists who claim, in effect, that science has so fully triumphed that whatever is left of religious doctrines must be changed and adjusted to meet the truth of science. Miller disagrees with this, but he never, to my satisfaction, explains *any* way in which religious truth might trump scientific understanding.

He does acknowledge that God "could have fashioned anything, ourselves included, *ex nihilo*, from his wish alone," but says that would have left his creatures "with neither freedom nor the independence required to exercise that freedom." (p. 291)

He says that Darwin himself was a "fence-sitter," at one point writing that he would be correctly described as an "agnostic" but another time writing that he "deserve[d] to be called a Theist." (p. 28 7) But then Miller's final sentence is, "I believe in Darwin's God." (p. 292)

Some challengeable statements: "New England leads the United States in church attendance and ice cream consumption ...." (p. 20) I don't know about ice cream consumption, but do people in New England really go to church more regularly than in the Bible Belt south, or in conservative mid-western states? I don't think so!

Interesting note about bias or subjectivity in science:

> "Don't rock the boat" might be good advice for an organization man trying to climb the corporate ladder, but for a scientific career, that slogan doesn't work. In science, where confirmatory data and consistency with established theory are regarded as boring, the best advice would be to rock the boat vigorously – maybe even to turn the damn thing over. (p. 83)

Illustration of creation-by-evolution: Miller anonymously quotes a speaker at a graduate seminar who said,

> If you deny evolution, then the sort of God you have in mind is a bit like a pool player who can sink fifteen balls in a row, but only by taking fifteen separate shots. My God plays the

> game a little differently. He walk up to the table, takes just one shot, and sinks all the balls. I ask you which pool player, which God, is more worthy of praise and worship? (pp. 283-284)

(Of course, this is inconsistent with Miller's own thesis that God did *not* arrange all the contingencies inherent in random selection to arrive at a pre-determined result.)

Key questions: If we grant that every form of life that exists started with a single molecule and developed through evolution, who or what made the jump from unliving matter to life? Was it some kind of a chemical reaction? If so, that would seem to be replicable in a laboratory.

If the Bible (the "book of God's word" and nature (the "book of God's works"), are both sources of truth, why does nature always trump the Bible? Why is there not at least one nugget of truth revealed in the Bible that trumps nature, or natural, scientific explanations?

If Jesus was truly human, as orthodox Christianity has always taught, was he the product of natural selection from random mutations; i.e., of evolution? If so, in what sense did God send him from heaven and cause him to be born of Mary?

Bottom line. This is a very, very good book, well-written, incisive, and mostly persuasive. The author is clearly a Christian who cares very much about his faith and how it can be understood as consistent with what he has learned from science. This book has convinced me that all the major points of evolution are true (as I understand them), but it has not altered my view that all the major points made in the Bible are also true. Most of the apparent conflicts, I believe, can be resolved by a non-literal interpretation of Scripture, but not all of them. I still believe that God somehow tweaked or rigged the evolutionary process to produce not only Adam and Eve (or the first humans) but also every single person who ever lived, and that, observing the sin and corruption produced by his creatures (exercising their free will), He sent his own Son, Jesus, from heaven to earth to save us. That is the Gospel truth!