

Living with Darwin: Evolution, Design, and the Future of Faith
by [Philip Kitcher](#)

A Religion for Darwinians?

A Review by H. Allen Orr

Darwinism seems to occupy a special place at the intersection of science, philosophy, and religion. One result is that evolution gets featured in controversies as different as those over theism versus materialism and nature versus nurture, to mention just two. In America, any discussion of evolution typically turns to the subject of creationism, the idea that an intelligent agent played a part in designing life. (According to this definition, creationism includes, but is not restricted to, the biblical account of life's origins.) Though some of us doubt that creationism provides an ideal vehicle for serious discussion of science and religion, the topic won't go away. In his latest book, *Living with Darwin*, Philip Kitcher considers creationist claims and uses them as a springboard for discussing subtler issues.

Kitcher, the John Dewey Professor of Philosophy at Columbia University, is a leading philosopher of science. His work concentrates on problems raised by biological, and especially evolutionary, research. His previous books, including [Abusing Science: The Case Against Creationism](#) (1982) and [Vaulting Ambition: Sociobiology and the Quest for Human Nature](#) (1985), have been read widely by both philosophers and scientists. *Abusing Science* was arguably Kitcher's most important book to date. A critical examination of the so-called scientific creationism prominent in America in the 1970s and 1980s, Kitcher's study deftly deflated the creationist balloon, pointing out its many absurdities as well as its disingenuous use of the scientific literature. "Scientific creationists," he showed, offered dubious geological and physical objections to the dating of fossils, among other things. They also had a habit of quoting biologists out of context, thereby manufacturing false crises within evolutionary biology. There seems little doubt that *Abusing Science* played a part in the demise of scientific creationism.

Kitcher now tells us that, given the rise of the movement claiming that "intelligent design" is revealed in nature, colleagues convinced him the time was right for another look at creationism. Though short, the resulting book is authoritative. It is also finely written. As Kitcher emphasizes, though, *Living with Darwin* is no mere update of *Abusing Science*. It's a different kind of book, with different goals.

Kitcher hopes to accomplish two things in *Living with Darwin*. One is to survey various versions of creationism and to recount the arguments against them. In doing so, he hopes to present a positive case for Darwinism and "to formulate it in a way that people with no great training in science, history, or philosophy could appreciate." Kitcher's other goal is more ambitious and -- given the current noisy debate over science and religion -- perhaps more important. He hopes to get at just what it is about Darwinism that's so threatening to religion. Why is it that of all intellectual enterprises, this one "particular piece of science provokes such passions, requires such continual scrutiny, demands such constant reenactment of old battles?" Kitcher believes that unless this question is answered, we are destined to repeat the wars between evolution and creation. In the final part of his book, Kitcher thus offers his diagnosis of the difficulties

Darwinism poses to faith and describes the adjustments to religion that he believes are demanded by science.

1.

Unlike many recent discussions, *Living with Darwin* surveys all the historical phases of creationism -- from the biblical accounts in Genesis to contemporary claims of intelligent design in nature. This approach is useful for two reasons. First, some people seem to believe that creationism represents a more or less coherent body of thought. It does not. Instead, the history of creationism is characterized by cycles involving the elaboration of a theory, its wholesale collapse, a lull of decades, and, ultimately, the elaboration of a radically different theory -- one that, without quite saying so, rejects all earlier varieties of creationism. Invariably, this newer theory makes claims that are considerably less ambitious than those of its predecessors. Seen historically, then, creationism looks less like a continuous body of thought and more like an extended exercise in backpedaling.

Second, it's not widely appreciated just how devastating the attacks on early creationist claims were. These were not episodes in which a theory met with mild difficulties, but ones in which theories imploded spectacularly. Kitcher draws an important conclusion from this fact. The problem with creationism, he insists, is not that it's not a science (because, for example, it is untestable); the problem is that it's a dead science. Creationist claims *have* been tested repeatedly against the facts of nature and they have failed badly. Unfortunately, this has not prevented the attempted resurrection of these claims by religiously motivated individuals or groups, often many decades after the ideas were falsified by scientists.

Kitcher distinguishes among several creationist positions, each of which has been important during one of creationism's historical phases. The simplest and earliest type of creationism was based on Genesis; a subtler and later position was what he calls novelty creationism; and a yet subtler and yet later position is anti-selectionism.

Creationism based on Genesis was popular in the eighteenth and early nineteenth centuries, when it more or less represented scientific orthodoxy. This species of creationism was committed to the literal truth of the Bible. Because both the Book of God and now, thanks to science, the Book of Nature could be read -- and because truth cannot contradict truth -- it became important to reconcile the nascent sciences of geology and biology with scripture. Natural theologians came to focus on two topics: the age of the earth and the meaning of fossils. Biblical genealogies suggested that the earth was about six thousand years old. Geological studies, though, soon made it clear that something was amiss with this conclusion. The geological strata -- the layers of rock sometimes visible in canyons or along roads cut through mountains -- are exceptionally deep and analyses of sedimentation rates revealed that hundreds of thousands of years were required to explain their deposition. And the news got worse. Not only were the strata old, they harbored the remains of unfamiliar creatures. This so-called fossil record also revealed striking patterns. The deepest strata, for instance, were clearly the oldest and included fossils of species that were mostly now extinct (primarily marine invertebrates). Higher in the strata more complex organisms appeared in turn: fish, then amphibians, then reptiles, then mammals. Primates and human beings appeared only near the top.

Scripture provided one obvious explanation of the fossil record -- Noah's flood. As Kitcher writes, "if almost all earth's life drowned in a roiling flood, the ordering of the fossils might be an effect of the deluge." The question was how to explain the consistency of the fossil record. Why, for instance, are fish always low in the strata and birds always high? Theorists such as Adam Sedgwick -- Darwin's first mentor in matters geological -- suggested that this consistency reflected the chronology of death from rising waters. Fish, for instance, would quickly succumb to mountains of sediment while birds could fly away. Kitcher skillfully recounts the problems that plagued, and ultimately doomed, this flood geology. Why, for instance, are whales and dolphins higher in the record than fish? Similarly, why do flightless birds like ostriches and penguins -- who should drown quickly -- appear with all other birds in the fossil record? And, among plants, why did ferns drown before conifers, which drowned before deciduous trees? The theory of the deluge degenerated into absurdity as it sorted species by mobility. As Kitcher puts it, "An oak tree leads the way, as a pine labors behind, and an overweight fern puffs in the rear." By about 1830, leading proponents of flood geology, including Sedgwick, began to recant. There was no way to deny the antiquity of the earth or that some organisms -- including human beings - - appeared long after the origin of life on the planet. Genesis was wrong.

The second creationist position concentrated on the origins of novel kinds of organisms. After the collapse of flood geology, scientists realized that there were only two ways to explain the fossil record. On the one hand, new species might appear in the record because they evolved from earlier species. Over long stretches of time, species might change, with, for instance, a group of reptiles slowly morphing into mammals. This idea of evolutionary "descent with modification" also suggested that all species might be related: we may all descend from a common ancestor. On the other hand, new species might appear in the fossil record because, now and then, God creates them. Under this hypothesis, reptiles did not evolve into mammals; instead, God created mammals from scratch. In the decades preceding Darwin's work, the eminent geologist Charles Lyell championed such "novelty creationism."

As Kitcher emphasizes, Darwin's [Origin of Species](#) was largely devoted to distinguishing between these hypotheses. And Darwin's case against novelty creationism -- and for descent with modification -- was overwhelming. Insects that live deep in dark caves are often blind. Did the Creator design a blind insect that was optimally suited to life in darkness? If so, Darwin asked, why do cave insects from America look so much like their seeing neighbors who live above ground, while cave insects from Europe also look so much like their seeing neighbors who live above ground? More to the point, why are blind and seeing insects more similar within continents than blind ones are across continents? This is unexpected according to the creationist idea of optimal design but is just what's expected if blind insects evolve within each continent from their seeing neighbors. As Kitcher also emphasizes, this was merely one of hundreds of examples considered by Darwin:

Why are there birds with webbed feet that live on dry land? Woodpeckers where no tree grows? Why are the fossils of extinct mammal species in Australia similar to the marsupials that inhabit the continent today? Why are the extinct armored mammals of South America akin to the currently living armadillos? Why are the birds of South America so like one another and so different from the birds of the Old World? Why does the same apply in the case of reptiles and

mammals? Why do the floras and faunas of islands regularly resemble those of the neighboring continents?

In all such cases, creationists strained to find explanations while evolutionists easily accounted for the observations. Even before the advent of genetic technologies like DNA sequencing that essentially proved the point, the conclusion grew inescapable: all species are related to one another and can change through time. There is a single "tree of life" and no evidence whatever that this tree has been broken by sudden acts of creative intervention. Lyell was wrong and Darwin right -- although this did not, of course, prevent the recrudescence of novelty creationist claims in the 1920s and 1970s.

The final creationist position, anti-selectionism, is concerned not with evolution per se but with the mechanism Darwin offered to explain this evolution -- natural selection. According to the theory of natural selection, species change through time because random mutations appear in their genetic material. Although these mutations are usually bad, on rare occasions they produce a new type of organism that differs slightly from the standard type in a way that results in its surviving more successfully than its predecessors. Because individuals having this new form leave more offspring on average than individuals having the old form, the new form increases in frequency within the species. Later, another mutation might arise that is still better; if so, this newest form will also increase in frequency. Extended over millions of years, this process should fashion organisms that are exquisitely adapted to their environments.

Anti-selectionism -- which denies that natural selection can do all that biologists say it can -- is the principal objection to Darwinism put forward by the current intelligent design movement. In its usual form (there are schismatic variants), intelligent design accepts both the antiquity of the earth and the relatedness of all species; it rejects, in other words, all previous forms of creationism. Intelligent design denies, however, that natural selection can explain all observed evolutionary transitions, especially those involving the emergence of extremely complex structures. Instead, the argument goes, an intelligent agent must have shaped those structures.

In practice, anti-selectionism often involves detailed analyses of particular biological systems. The biochemist Michael Behe has argued, for instance, that certain cellular structures, like the bacterial flagellum (a whiplike appendage that lets bacteria swim), are too complex to be built by selection. He argues that the flagellum is "irreducibly complex": though it includes some thirty different parts, all must be present for the flagellum to work. The key point is that because natural selection requires every step in evolution to be an improvement on what went before, selection cannot, we are told, gradually build a structure that's irreducibly complex. After all, any putative intermediate step in the evolution of the flagellum -- one that included only, say, fifteen of the requisite parts -- wouldn't function at all.

Evolutionary biologists, myself included, have responded to this claim with a barrage of arguments. The simplest is that evolution doesn't always involve the cobbling together of parts to perform a function that remains constant through time. Instead, evolution sometimes grabs a structure that already performs function X and brings it together with other parts to perform a new function, Y. It doesn't matter that the first structure couldn't perform Y; it was doing

something else. Importantly, evolutionary biologists can sometimes fill in the X and the Y, rendering this abstract argument concrete.

Even better, we can do so for the bacterial flagellum. Recent work strongly suggests that a core set of parts forming the flagellum once functioned in a primitive secretion system. These parts, in other words, once played a role in moving chemicals from inside the bacterial cell to the outside of the cell. It seems possible, then, that the evolution of the flagellum involved the co-option of this secretory system for a wholly new function, bacterial movement.

If you find this sort of Darwinian argument insufficiently detailed, Kitcher asks you to consider the creationist alternative: an intelligent agent created the flagellum. Just how, Kitcher asks, did he do this? Did he arrange the right series of environments such that bacteria loaded down with only half the parts needed to make a flagellum survived? Or did he cause all the mutations required to make a flagellum appear at once? And if the Creator can do such things, why doesn't he perform the far simpler trick of correcting the single mutations that cause so many terrible human diseases? Intelligent design is stunningly silent on the actual mechanism of creative intervention. Anti-selectionism, Kitcher says, is not only mistaken; it fails to provide any coherent alternative to Darwinism.

Kitcher's survey of creationist thought is superb and his conclusion unequivocal: all three creationist positions are hopelessly flawed. They are dead science.

2.

After summarizing the case against creationism and the one for Darwinism, Kitcher turns to the question that seems most to motivate *Living with Darwin*: Just what is it about evolution that's so dangerous to faith? He embeds his answer in a larger account of what he calls the enlightenment case against religion. This case includes several familiar elements: Hume's skeptical philosophy, the rise of serious biblical scholarship, and the disturbing revelations of science generally and Darwinism particularly. (Kitcher thinks Darwin continues to play an especially prominent role in controversies about religion both because his conclusions are so troubling and because, as a fixture of the high school curriculum, Darwin is more visible to Americans than are, say, Hume or the Jesus Seminar.)

Unlike some scientists and philosophers, Kitcher believes that there is a real and serious conflict between Darwinism and religion. But he argues that the conflict is not necessarily between Darwinism and all varieties of faith. To show this, he distinguishes among three varieties of religion. These suffer, he believes, different fates when confronted with the enlightenment case.

Providentialist religion holds that "the universe has been created by a Being who has a great design"; importantly, this Being is deeply concerned with the welfare of human beings. A providentialist God is a God to whom one might pray. Kitcher believes that providentialist religion ultimately succumbed to the problem of evil. Though theologians struggled for centuries to reconcile the ubiquity of evil with an omnipotent and caring Creator, the problem was exacerbated immensely -- and, Kitcher believes, fatally -- by Darwinism, wherein evil assumes the form of mass suffering under natural selection:

Darwin's account of the history of life greatly enlarges the scale on which suffering takes place. Through millions of years, billions of animals experience vast amounts of pain, supposedly so that, after an enormous number of extinctions of entire species, on the tip of one twig of the evolutionary tree, there may emerge a species with the special properties that make us able to worship the Creator.

Supernaturalist religion is broader. While it features a transcendent Being, that Being may or may not concern itself with human beings. Most of the world's religions are supernaturalist. They rely on "oral traditions or canons of scripture that describe the characteristics and actions of supernatural entities," and belief in such a religion typically requires "belief that many of these descriptions are literally true." Kitcher claims that the enlightenment case mostly closes the door on supernatural religion. Both biblical scholarship and evolutionary research demonstrate that scripture cannot be taken as literally true. The gospels, for example, are riddled with factual inconsistencies (John has Jesus driving the money-changers from the Temple near the start of his ministry, while the synoptic gospels put it near the end) and the descent of all species from a common ancestor forces rejection of Genesis. Since, Kitcher writes, "there is no basis for holding that the received stories of this Creator are literally true," faith totters and intellectual honesty frequently forces believers to seek a basis for faith beyond supernaturalism.

The key question is: Is there any religious faith beyond supernaturalist religion that remains untouched by the enlightenment case? Kitcher concludes that there might well be. He calls this final variety of faith "spiritual religion." Spiritual religion abandons both the supernatural and literalism and, in their place, offers ethical models of right action and moving portraits of nobly lived lives. The "seekers" who pursue spiritual religion are plainly the product of liberal theology, and Kitcher concentrates on Christian versions of the faith. Such Christians surrender the literal resurrection and any prospect of eternal life but celebrate the "teachings, the precepts and parables" of the gospels. Kitcher points to the religious scholar Elaine Pagels as representative of the approach. As described in her [Beyond Belief](#), Pagels discovered in the church a community and a body of religious practice that spoke deeply to her. Pagels steers far clear of biblical literalism (indeed she's famously skeptical of the early Church's selection of texts for the canonical New Testament), and appears uncommitted to particular claims about transcendent beings. She represents a sophisticated form of faith that could never be mistaken for providentialism or supernaturalism.

Because spiritual religion neither makes explicit claims about the state of the world nor holds up any body of sacred texts as literally true, it cannot, Kitcher argues, be contradicted by the findings of science or scriptural scholarship. Secularists, he concludes, must concede that the enlightenment case ceases at the border of spiritual religion.

3.

Although Kitcher's taxonomy of faith highlights several important distinctions, it isn't entirely clear that it accomplishes all he thinks it does. The main problem is that Kitcher ties his category of supernaturalism to two different things: belief in a transcendent Being and the literal truth of texts that allege to tell us about this Being. He seems to think that enlightenment rejection of scriptural literalism leads, probably if not inevitably, to rejection of supernaturalism. But surely

the truth of supernaturalism doesn't depend on the accuracy of any particular text about the supernatural. These are different matters, one metaphysical (does a supernatural Being exist?) and the other epistemological (how could we come to know about such a Being and, in particular, to what extent can we trust traditional sources of knowledge about this Being?). The distinction is perhaps clearest with deism, the idea that a mind underlies the material universe. This species of religion falls between the cracks of Kitcher's taxonomy: it's certainly supernaturalist but it's not remotely literalist. (There is no sacred text of deism.)

To complicate matters further, Kitcher at one point seems to acknowledge all this. He concedes that we must admit that "the history of inquiry shows that our horizons have often expanded to encompass things previously undreamed of in anyone's natural history." Although he doubts such inquiry will reveal anything that might count as transcendent, he admits the formal possibility. But he doesn't seem to appreciate the full logical force of this admission. If supernaturalism can be true despite the falsity of all literalist claims, just how is it that the enlightenment case against literalism weighs decisively against supernaturalism? The problem is not merely logical. As Kitcher acknowledges, Christianity did not, for most of its history, insist on anything like literal interpretation of scripture. Instead, early theologians like Augustine, Origen, and Heracleon often offered loosely metaphorical interpretations. Literalism, at least as a dominant view, appeared surprisingly late in the history of Christianity, in the wake of the Reformation and Counter-Reformation. Surely Kitcher would not have us conclude that early theologians, by eschewing biblical literalism, were eschewing supernaturalism?

It would be churlish, though, to make too much of this point. Kitcher's analysis adroitly handles several other issues, including some that are exceedingly tricky. The most important involves the boundary between spiritual religion and secular humanism. This boundary is blurry and one might ask whether it exists at all. Kitcher is keenly aware of the question and his answer is nuanced. He has shown, he argues, that the enlightenment case against religion goes only so far; by exclusion, he labels whatever lies beyond this point spiritual religion. But he has not shown, and is not himself sure, that this so-called religion is anything but secular humanism viewed through stained glass. Indeed spiritual religion is, he believes, somewhat prone to melting back into either supernaturalism on the one side or humanism on the other. In an important move, Kitcher places on defenders of spiritual religion the burden of distinguishing themselves from secularists. He has shown that the enlightenment case against faith ceases at spiritual religion, but they must show -- "as clearly as they can" -- just what it is that they embrace that secular humanists cannot also embrace. Though Kitcher cannot see just how proponents of spiritual religion can meet this challenge, he cannot exclude the possibility of an adequate response and thus cannot "close the case against religion, period."

Despite this somewhat ambiguous conclusion, Kitcher's treatment does in fact identify one significant difference between spiritual religion and secular humanism, in practice if not in principle: tone. Kitcher is acutely sensitive to this issue and makes it clear that he's deeply disturbed by the rhetoric of some militant secularists:

Often, the voices of reason I hear in contemporary discussions of religion are hectoring, almost exultant that comfort is being stripped away and faith undermined; frequently, they are without charity. And they are always without hope.

Too often, the New Atheism forgets to make its humanism humane.

Spiritual religion, whatever its intellectual content, will have nothing of this. Sensitive to the literature of traditional religion and revering its evocations of a higher life, spiritual religion may have something to teach humanism about tempering its excesses and modulating its tone. Over the years, many have worried about humanism's ability to long survive, independent of its historical roots in religion. Part of the solution, Kitcher seems to suggest, may be to reacquaint humanism with the humility and sensitivity that can characterize spiritual religion. In any case, we must "make secular humanism responsive to our deepest impulses and needs, or to find, if you like, a cosmopolitan version of spiritual religion that will not collapse back into parochial supernaturalism."

There can be little doubt that Kitcher's own book represents a significant step in this direction. In a time of strident pronouncements on the intersection of science and religion, Kitcher has introduced a calm and humane voice. We Darwinians could do much worse than to listen to it.

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