

Signs of design: Is there purpose in evolution?

by [J. Scott Turner](#) in the [June 12, 2007](#) issue

Because I am a biologist, evolution is at the core of virtually everything I think about. Like most of my colleagues, I've kept an eye on the emerging "intelligent design" movement. Unlike most of my colleagues, however, I don't see ID as a threat to biology, public education or the ideals of the republic. To the contrary, what worries me more is the way that many of my colleagues have responded to the challenge.

ID proponents claim that Darwinism is insufficient to explain the origin and evolution of life on Earth. All is better explained, they say, if there is some kind of designing intelligence guiding things. These assertions are based on two core ideas. The first is essentially a scientific theory of miracles that is the brainchild of philosopher and mathematician William Dembski, one of ID's leading intellectual lights. According to Dembski, one can use rules of probability and information theory to construct "explanatory filters" that can objectively distinguish between purely natural phenomena that come about on their own and phenomena that require some kind of intelligent guidance—a miracle, in a word. Applying an explanatory filter to, say, the origin of life reveals that the probability that life arose by chance is infinitesimal. This in itself is not a particularly novel or controversial idea—no biologist I know would disagree. But Dembski parts company with the rest of us when he insists that a designing intelligence is the only agency that could bring such an improbable event to pass. What heats people up, of course, is that Dembski's "designing intelligence" strikes many as code for "God."

The second core idea comes from microbiologist Michael Behe, who is another of ID's leading lights. He asserts that living systems exhibit a sort of "irreducible complexity" that cannot be derived from the piecemeal evolution that Darwinism demands. The poster child for this argument is the bacterial flagellum, a whiplike device that bacteria use to propel themselves around their environment. This remarkable contrivance, which resembles an electric motor, is built from protein parts and will work only when all the parts are assembled into the complex

whole—and this is why Behe calls its complexity irreducible. Whether the flagellum actually is irreducibly complex is questionable: scientists have proposed reasonable models for how its design could have emerged via piecemeal evolution.

Nevertheless, Behe considers irreducible complexity to be proof positive of a designing intelligence at work: how could the flagellum have developed by natural selection if none of its elements by themselves would have made the organism's predecessor more fit to survive? Behe claims that many other attributes of living systems, including the complicated structure of genomes, mechanisms for gene replication, and complex metabolic pathways in cells, are likewise irreducibly complex. What stirs the pot is ID's claim that all this irreducible complexity constitutes a rhetorical dagger pointed at the heart of Darwinism.

If all this sounds familiar, it should: it is essentially natural theology and the argument from design dressed up in modern clothes—William Paley equipped with a computer and electron microscope. Looked at in this way, ID seems not so much like the radical alternative to Darwinism that it claims to be, and more like nostalgia for the Platonic tradition in natural history that prevailed prior to Darwin.

The nostalgia is puzzling: for centuries, the Platonic tradition tied natural history into knots, with some of the most intractable tangles woven around the nature of species and the meaning of the apparent design that abounds in the living world. In a single decisive stroke, Darwin cut a wide path through this Platonic morass with a simple and, most important, reasonable natural explanation for why species exist and why they exist in such marvelous diversity and complexity. To extend Richard Dawkins's famous quip that Darwin made it possible to be an intellectually fulfilled atheist, so too did Darwin make it difficult to be an intellectually credible Platonist.

Nevertheless, ID is as popular as it is controversial, and Platonic nostalgia is not enough to explain why. Something deeper is obviously at play.

To most people who contemplate the natural world, it seems self-evident that the world is a designed place. Despite its many difficulties, the Platonic tradition endured because it offered a satisfying explanation for why: the world reflects God's purposeful design for creation. In dethroning the Platonic tradition, Darwin seemed to take that purpose away, and this has obviously been a difficult pill for many to swallow. It's not so clear, however, that Darwin did divorce design and purpose so decisively from the living world. Indeed, to claim that he did is to misread the history

of Darwinism.

Consider, for example, the bedrock concept of Darwinian fitness. Natural selection operates because “fit” individuals are more fecund than “unfit” individuals. This should, over time, produce populations of fitter creatures, even though there is no purpose at work here, no striving for perfection. However, a problem lurks in this seemingly simple explanation. For a scientific idea to be credible, there must at least be the possibility that one can show it to be incorrect. Darwin ran into early difficulty on this score because the conventional depiction of fitness cannot be false—fecundity is fitness, and fitness is fecundity. To Darwin’s early critics, a veritable fountain of doubt gushed from this tautology at the heart of his theory.

Edward Drinker Cope, a 19th-century American paleontologist, probably expressed the issue best. The problem is not so much the origin of species as it is the origin of fitness: how, precisely, do organisms become well-crafted—*fit*—things? To Cope, and to many of Darwin’s contemporary critics, the way out of the tautology was the very purposefulness that Darwin so adamantly insisted we reject.

Interestingly, Darwin himself was a little muddy on the issue. Asa Gray, the Harvard botanist who was Darwin’s most energetic advocate in the 19th-century U.S., actually saw in Darwinian adaptation the vindication of purposefulness in biology—to Darwin’s chagrin. Darwin’s most enthusiastic German convert, Ernst Haeckel, did Gray one better, crafting his own theory of evolution by melding Darwinian natural selection with the purposeful *Naturphilosophie* of romantics like Goethe—and leaving Darwin not just exasperated but aghast.

One could argue that Gray and Haeckel simply failed to understand Darwin’s elegantly simple idea, but that argument doesn’t hold water. Alfred Russell Wallace, who independently conceived the idea of natural selection and whose thinking surely would be most closely aligned to Darwin’s own, thought that purpose in some form had to have guided the origin of life and the origin of consciousness in the higher animals, particularly humans. One finds similar doubts cropping up among thinkers throughout the late 19th and early 20th centuries—Freud, Louis Agassiz, Carl Jung and Henri Bergson, to name a few—and all were concerned about Darwin’s insistence that a purposeless materialism is all there is.

To be fair, much of the ambiguity and unease swirling around during Darwinism’s early years was fueled by a lack of knowledge about how another core Darwinian

concept—heredity—works. For a time, it was thought that we could resolve Cope’s question about how organisms came to be fit by clarifying the material nature of the gene, Mendel’s “atom of heredity.” That quest succeeded spectacularly, culminating in today’s remarkable revolution in molecular biology, and engendering along the way our modern answer to Cope’s question: the gene-centered conception of Darwinism—neo-Darwinism, as it is called—in which fitness arises by way of the selection of “good-function genes” at the expense of “poor-function genes.”

For a time, neo-Darwinism triumphantly swept away quaint notions of purposeful evolution, to the point where Will Provine, the eminent Darwin historian, could confidently say that there are “no designing agents in evolution.” That confident pronouncement may have been premature, however. As we discover more about how genes work, the stranger they become; they are far from the simple specifiers of good and poor function that they were classically thought to be. Paradoxically, this has breathed new life into Cope’s question, making it more acute, not less so. Indeed, my own scientific work has led me to a conclusion that is precisely the opposite of Provine’s: designing agents are in fact everywhere, if only you know how to spot them. The ubiquity of these designing agents may make evolution a far more purposeful phenomenon than neo-Darwinists have been willing to allow.

This puts intelligent design into what I believe is its proper perspective: it is one of multiple emerging critiques of materialism in science and evolution. Unfortunately, many scientists fail to see this, preferring the gross caricature that ID is simply “stealth creationism.” But this strategy fails to meet the challenge. Rather than simply lament that so many people take ID seriously, scientists would do better to ask *why* so many take it seriously. The answer would be hard for us to bear: ID is popular not because the stupid or ignorant like it, but because neo-Darwinism’s principled banishment of purpose seems less defensible with each passing day.

A more constructive response to the ID challenge would ask whether ID is a credible critique of Darwinian materialism. In my opinion, that judgment should turn on one simple criterion: Will ID pose testable answers to Cope’s question? By this measure, a fair reading of ID’s prospects shows that it is in the game, though it has stepped up to the plate with two self-inflicted strikes against it. The first strike is its philosophical commitment to the argument from design and to the Platonic intelligent designer it implies. The second strike is that the testable ideas it has produced, like Behe’s irreducible complexity, have not so far measured up. Whether ID gets a third strike will depend on whether it can come up with a credible and

scientific theory of purposeful evolution. Most scientists, including me, doubt that it will be able to, but of all people scientists should know that the world is full of surprising things. ID might surprise us still.

It seems less than sporting, then, to call the pitch while it's still in the air, which is precisely what many of my colleagues insist on doing, sometimes quite vehemently. This, to me, is the most problematic thing about the controversy: it's not ID that keeps me awake at nights, but the tactics and attitudes of certain colleagues who really should know better. In Pogo's immortal words, "We have met the enemy and he is us."

One doesn't have to look far to find examples of conduct unbecoming. There is the recent case of Richard Sternberg, an unpaid staffer at the National Museum of Natural History (part of the Smithsonian), who became the object of a malicious campaign to oust him from the museum. Sternberg's crime? As managing editor of a Smithsonian-affiliated journal, he decided to publish an article that was sympathetic to ID on the seemingly reasonable grounds that a scientific journal is the appropriate venue for an advocate of a controversial theory to state his case. The Justice Department rapped the museum's knuckles for its treatment of Sternberg.

It would be comforting if one could dismiss such incidents as the actions of a misguided few. But the intolerance that gave rise to the Sternberg debacle is all too common: you can see it in its unfiltered glory by taking a look at Web sites like pandasthumb.org or recursed.blogspot.com and following a few of the threads on ID. The attitudes on display there, which at the extreme verge on antireligious hysteria, can hardly be squared with the relatively innocuous (even if wrong-headed) ideas that sit at ID's core. Why, then, are such attitudes commonplace? The only explanation I can come up with is that many biologists regard ID as a dire existential threat. And that is what really troubles me about the ID controversy: the animal that feels threatened is the one most likely to do something irrational and destructive.

Consider, for example, the most emotionally charged issue related to ID—whether it has any place in our classrooms. One can render plausible arguments that it does: even if ID is wrong, students are interested in the issue, and it offers a wealth of teachable moments to explore deeper issues of the philosophical roots of biology and the nature of science. What, then, is the harm in allowing teachers to deal with the subject as each sees fit? Advance this seemingly reasonable proposition, and you are likely to see scientists rolling their eyes; some may even become apoplectic.

When pressed to explain why normal standards of tolerance and academic freedom should not apply in the case of ID, scientists typically reply with all manner of evasions and prevarications that are quite out of character for otherwise balanced, intelligent and reasonable people. To give just one argument that has turned up frequently in my correspondence with colleagues: because ID has its roots in fundamentalist Christianity (a dubious proposition in itself), admitting it into our classrooms will foster an exclusionary and hurtful climate, as would admitting other exclusionary sins such as racism or sexism.

Even setting aside the numerous head-turning non sequiturs that weave through this argument, a stroll through most modern universities will quickly reveal how hollow the argument is. Each day as I make my way to my office, for example, I pass the usual gauntlet of Bushitler cartoons and “Duck, it’s Dick” posters, and doors plastered with lame jokes and cartoons about Republicans, Christians and conservatives. “Abortion Stops a Beating Heart” posters, on the other hand, are as rare as four-leaf clovers. The display is a stark panorama of what the modern academy is evolving into: a tedious intellectual monoculture where conformity and not contention is the norm. Reflexive hostility to ID is largely cut from that cloth: some ID critics are worried not so much about a hurtful climate as they are about a climate in which people are free to disagree with them.

Such things are easily laughed off as the foibles of the modern academy. My blood chills, however, when these essentially harmless hypocrisies are joined with the all-American tradition of litigiousness, for it is in the hands of courts and lawyers that real damage to cherished academic ideals is likely to be done. This is not mere lawyer-bashing: as universities become more corporatized and politicized, academic freedom and open inquiry are coming under an ever more grave threat. A case in point is the recent federal court decision in *Mayer v. Monroe County Community School Corporation*, which essentially dismisses the notion of academic freedom in high schools. The court found that teachers have no academic autonomy but are only instruments for advancing the interests of school boards.

My university colleagues should not take much comfort in the fact that this decision involved a high school, because it would require only a short step to apply the same logic to them—a step that some administrators are eager to take. A high-level administrator at the prestigious university near my own has gone on record saying that First Amendment rights of free speech do not apply at an “educational corporation” like a private university. We should take heed: courts, ambitious

attorneys and lawsuit-averse administrators are manifestly not academics' friends when it comes to unfettered free speech. Yet the courts are where many of my colleagues seem determined to go with the ID issue. I believe we will ultimately come to regret this.

Take, for example, the recent case in Dover, Pennsylvania, where a group of parents sued the local school board over its requirement that a statement be read to biology students encouraging them to keep an open mind about alternatives to Darwinism. The plaintiffs regarded this requirement as “stealth creationism”—an unanswerable criticism if you think about it—and, backed by the ACLU, they sought relief in the federal courts. There were few heroes to be found in the spectacle that followed. The only bright spot was when a larger group of grown-ups, the Dover electorate, put a stop to the circus by voting out the school board that had put the offending policy in place. Unfortunately, this happy outcome did not keep the judge from ruling for the plaintiffs, decreeing that teaching about ID is constitutionally proscribed.

Many of my scientific colleagues were involved in this case. One would hope that they would have taken a stance of principled neutrality, offering a robust defense of academic freedom tempered with the sober recognition that freedom means that sometimes people will think, speak and even teach things one disagrees with. Instead, my colleagues took sides; many were actively involved as advocates for the plaintiffs, and they were cheered on by many more from the sidelines. Although there was general jubilation at the ruling, I think the joy will be short-lived, for we have affirmed the principle that a federal judge, not scientists or teachers, can dictate what is and what is not science, and what may or may not be taught in a classroom. Forgive me if I do not feel more free.