

Dennett's Strange Idea

Natural Selection: Science of Everything, Universal Acid, Cure for the Common Cold . . .

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Darwin's Dangerous Idea

Daniel C. Dennett

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Evolution is henceforth the magic word by which we shall solve all the riddles that surround us.

-- Ernst Haeckel¹

A reviewer has a duty to take a book's intended audience into account. A picture-book of dinosaurs for children and a hefty tome on paleontology should and must be different. I bring this up because the market for Daniel Dennett's new book, *Darwin's Dangerous Idea*, is, at first, unclear: Is this pop science or a serious attempt to think new thoughts? The question matters because the verdict changes with the audience. As a work of popular science (with a healthy dose of philosophy thrown in), Dennett's book is a modest success. Although he lacks the graceful prose of a Gould or Dawkins, Dennett delivers a thoughtful and provocative book, and many of his readers will surely dig deeper into evolution as a result. Because Dennett's book certainly sports many of the trappings of pop science (e.g., Cute New Names for every old idea), my review might have ended here, favorably.

But Dennett is not in the edutainment business. Near the beginning of his book, he tells us: "I want to play a more direct role in changing what is ignorable by whom. I want to get thinkers in other disciplines to take evolutionary theory seriously, to show them how they have been underestimating it, and to show them why they have been listening to the wrong sirens." In short, Dennett wants to talk to the pros. And it is here -- in his attempt to change the way intellectuals, both scientists and humanists, think about Darwinism -- that his book fails.

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Dennett's thesis is simple enough. He is convinced that intellectuals underestimate the explanatory power of evolutionary theory, which to Dennett means natural selection. He is sure that natural selection is both more potent within biology than many biologists believe and more relevant to problems outside biology than many social scientists and philosophers pretend. In an analogy that runs through the book, Dennett likens Darwinism to a "universal acid," an allusion to childhood lore about an acid so corrosive that it eats through everything -- including the jar in which you desperately try to contain it. According to Dennett, the universal acid of natural selection can spread both *downward* from biology, explaining the origins of the universe and life, and *upward* from biology, overturning our views of consciousness, cultural change, and the origin of morality. The resulting Darwinian Science of Everything "eats through just about every concept, and leaves in its wake a revolutionized world-view." Dennett takes this Science of Everything idea very seriously: "The idea of evolution by natural selection unifies the realm of life, meaning and purpose with the realm of space and time, cause and effect, mechanism and

physical law."

The bad guys in Dennett's book are those intellectual reactionaries who have convinced others that Darwinism can be safely bottled up within biology. Panicked by the spread of scientism, they plead:

Cede some or all of modern biology to Darwin, perhaps, but hold the line there! Keep Darwinian thinking out of cosmology, out of psychology, out of human culture, out of ethics, politics, and religion!

Dennett is not shy about identifying the obstructionists. Noam Chomsky is a ringleader, along with the biologists Richard Lewontin and Stephen Jay Gould, and the philosophers John Searle and Jerry Fodor. Remarkably enough, Dennett thinks he has found a common anti-Darwinian sin that binds these men together. In one way or another, Dennett argues, they each invoke a "skyhook" -- a miraculous force or process that gets snuck in the back door to explain some aspect of design in the world, whether a *Bauplan*, Universal Grammar, or even a moral code. Among pre-Darwinian naturalists, God served as an unusually conspicuous skyhook. Why bother with conceiving a natural process that yields adaptation when God will do the trick? But bring on the acid: Darwinism teaches us that skyhooks are mythical. Design -- whether manifest in cuttlefish or culture -- is always built from the ground up by natural selection, without intervention from any outside superintendent.

Sketched like this, Dennett's claims may sound a bit fantastic, the wild dispensations of a barroom know-it-all. They are not. Dennett is an accomplished philosopher who has thought long and hard about these problems. His arguments are sophisticated and are often fleshed out in erudite detail. And judging from the rave reviews on the jacket-cover, he has won over several leading evolutionary biologists. Dennett cannot be dismissed lightly.

That said, I cannot join in the chorus of praise. Dennett's book suffers from a number of problems. The most obvious has nothing to do with the soundness of his arguments, but with how they are tendered -- the book suffers from an annoying stylistic inconsistency. Although many sections are written in a breezy conversational style, the reader, with an almost audible thud, will plow into a technical section laden with alien jargon. Similarly, Dennett will introduce some cute idea that, it seems, will play an important role in his story, e.g., the "Cosmic Pyramid." But that ethereal Pyramid is barely mentioned again and the reasons for its invention and debut are frustratingly unclear. I later discovered one cause of this choppiness: Dennett is not fond of re-working an idea he's once committed to paper. As a result, a ten page section from one of his previous publications in, say, the *Journal of Aesthetics and Art Criticism* will be plopped down nearly verbatim in his book (indeed that particular passage made yet a *third* appearance in another of his books, *Consciousness Explained*). A surprising portion of Dennett's book consists of snippets from previous papers stapled together. The result is not seamless prose.

The book is also marred by factual errors, some scientific and some historical. Population genetic theory, for instance, does not prove that evolution by random change is faster than evolution by natural selection, as Dennett claims. And it was Darwin's theory of sexual, not natural, selection that he called an "awful stretcher." (Darwin branding natural selection a stretcher is about as plausible as Chomsky branding Universal Grammar a real howler.) But these are peccadilloes and do not touch on Dennett's main claims. Unfortunately, Dennett has many main claims and we cannot consider them all. I will focus here on two: the notion that natural selection is more powerful within biology than biologists often claim; and the notion that Darwinism can diffuse out from biology, throwing light on the evolution of cultures and the origin of morality.

Adaptationism

Dennett is deeply troubled by what he sees as assaults on natural selection within biology. He devotes two chapters to defending the view that "Biology is Engineering" -- that organisms are best viewed as machines that have been optimally "designed" by natural selection. If correct, this engineering angle is

immensely important to biologists as it suggests a research program. Just as we can sensibly ask about the purpose of any part in a human-engineered machine ("Why do cars have spark plugs?"), so we can ask about the purpose of any trait in an organism ("Why do men have nipples?"). According to adaptationism, then, evolutionary biologists are in the business of constructing adaptive stories about why organisms are the way they are.

But Dennett does not so much champion adaptationism as excoriate those biologists who dare question it. His main targets are the Harvard biologists, Gould and Lewontin. In 1979, they published an influential (and still-controversial) paper in which they argued that adaptationism is flawed.² Their argument was simple: Although natural selection is an important force driving evolution, it does not follow that each arbitrary character one can point to has an adaptive purpose. Instead, some features of organisms are like "spandrels" in ecclesiastical architecture -- the v-shaped spaces formed when two rounded arches meet at a right angle. Although spandrels are often decked out with mosaics, no one would seriously argue that spandrels are there *because* they provide such swell surfaces for mosaics. Instead, spandrels are there because they *have to be* -- they are, it turns out, an inevitable by-product of putting a dome on rounded arches. Gould and Lewontin's warning was obvious: Organisms may also sport spandrels. Some traits have no adaptive tale to tell, but reflect structural constraints imposed by an organism's development or by its quirky evolutionary history.

Consider, for example, the blind spot, a small hole in our visual field. The blind spot represents the point where the optic nerve -- inside our eye -- plunges through the retina on its way to the brain. The blind spot is a maladaptive legacy of our evolutionary past. Early in vertebrate evolution, light sensitive tissue folded up in such a way that our proto-eye was left with its neuronal wiring *on the inside*.³ Once evolution veered off in this direction, a blind spot was a structural inevitability. If the wiring starts on the inside of the eyeball, some wire somewhere must plunge through the back of the eye to reach the brain. One makes up adaptive stories about the resulting blind spot at some peril.

Although many biologists suspect that Gould and Lewontin overstated their warning, most would, I think, agree with John Maynard Smith's assessment that their paper was "on the whole welcome."⁴ Alas, such moderate positions do not come naturally to Dennett. Although he pays lip service to the notion that any adapted system suffers from "undesigned" features, Dennett is hot under the collar about Gould and Lewontin and their nefarious spandrels. The strange thing is, it's not so obvious why. Why, after all, should a man hoping to export Darwinism from biology be so obsessed with defending the minutiae of adaptive story-telling within biology? I would not think the legitimacy of, say, cultural Darwinism hangs critically on whether selection is very important in biological evolution (as everyone, including Gould and Lewontin, believe) or is almost exclusively important (as Dennett believes). Cultural Darwinism could be right -- or wrong -- in either case. Dennett, though, seems convinced that he has a big stake in this distinction.

Apparently, Dennett sees red whenever adaptationism is questioned because he suspects a plot to sneak in a skyhook: If you don't like adaptationism, what do you think explains all this biological design? Unfortunately, Dennett's skyhook-phobia gets the best of him, undermining any hope of a balanced review of the powers and perils of adaptationism. His review of attempts by biologists to circumscribe the role of natural selection is extraordinarily unbalanced. Consider this remarkable omission. Although a full third of his book examines challenges to evolution by natural selection "that have arisen within biology itself," Dennett never once mentions *the* most serious and famous of all challenges to selectionist story-telling: the neutral theory. Championed by Motoo Kimura,⁵ this theory claims that most evolution at the molecular level is *not* caused by natural selection, but by "genetic drift," the random replacement of one gene by another, functionally equivalent gene. If this is true, many differences between species have no adaptive significance. The fact that your hemoglobin looks like *this* and a spider monkey's looks like *that* reflects chance, not adaptation.

Why doesn't Dennett at least acknowledge this enormous challenge to selectionism? One possibility is that he may not know the neutral theory. Kimura -- a mathematical population geneticist -- is a tad harder to read than the pop biology Dennett appears to devour. This interpretation is supported by Dennett's claim that selection can detect any favorable variant, "[h]owever tiny the advantage in question" -- a claim that the neutral theory shows is false. But this is probably the harmless hyperbole of a popularizer. And in one place Dennett admits that chance replacement of genes can occur, so he has obviously heard the neutralist song. A more serious possibility is that Dennett is interested only in "real" evolution -- the camel's hump and the elephant's trunk -- and not the evolution of molecules. But this can't be, for Dennett never tires of telling molecular stories *when they're adaptive*. Alternatively, Dennett may not want to let the cat out of the bag. Maybe he doesn't want the naive reader to know that biologists *have* found a place where the "universal acid" of selection becomes (quite literally) neutral and that many biologists believe that such "non-Darwinian" evolution is common.

But I suspect the real explanation is that Dennett is interested in Design (the upper-case "D" is his) and the neutralist/selectionist controversy has nothing to say here. If I am right about this, Dennett fundamentally misunderstands biologists' worries about adaptationism. Evolutionists are essentially unanimous that, where there is apparent "Design" in organisms, it is caused by natural selection. Consider the phenomenon of mimicry in butterflies, where a tasty species resembles an unpalatable species. Anyone who denies that selection is at work here simply doesn't know enough about mimicry in butterflies. But the reason this example goes undisputed is that the design is so terribly obvious. Even if we cannot, at first, fathom the precise cause of the remarkable similarity between, say, the monarch and viceroy butterflies, we know that unrelated species do not look alike by accident.

Our problem, as evolutionary biologists, is not a weakness for fictitious alternative causes of Design. Our problem is that, in many adaptive stories, the protagonist does not show dead-obvious signs of Design. Is it obvious that the recessivity of most genetic diseases is adaptive? Evolutionists used to think so, but we now know they were almost surely wrong. Is it obvious that flower color differences in plants are adaptive? Many evolutionary biologists have begged to differ. Is it obvious that most molecular differences between species need adaptive explanation? The neutralists and selectionists give very different answers. And, last, is it obvious that the neural wiring that allows human language evolved as an adaptation *for* language? Different linguists reach different conclusions. The fact is we often have enormous difficulty distinguishing what is and is not "Designed" -- what does and does not require its very own adaptive story.

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If this weren't bad enough, our problem gets exacerbated by a little-noted, but immensely important, characteristic of our scientific culture: *Evolutionary biologists thrive on creating adaptive stories where Design is least obvious*. After all, where is the glory in explaining why some new species of mite is brown ("it hides in dirt")? The great challenge is to explain why some feature -- whose Design is far from apparent -- is actually adaptive and optimally Designed ("this enzyme is more common in the mother than the fetus because . . .").

Given our difficulty discerning Design, and this penchant for concocting adaptive stories just where Design is least conspicuous, how could evolutionary biologists *not* have jitters about adaptationism? It would be an extraordinarily unreflective group indeed that did not ask questions like: How seriously

should we take these endless adaptive explanations of features whose alleged Design may be illusory? Isn't there a difference between those cases where we recognize Design *before* we understand its cause and those cases where we try to make Design manifest *by* concocting a story? And isn't it worrisome that we can make up adaptive stories (and pen wildly speculative papers) faster than we can make up experimental tests? Note that there is no mystical talk here of imagined alternative causes of Design, nor any fatuous Darwin-bashing. There is just sensible concern about how much adaptationism is too much of a good thing. When does adaptationism stop being a useful research strategy and start being a silly exercise in cleverness? Dennett never confronts these legitimate worries. It is far easier for him to ridicule Gould and Lewontin's rhetorical excesses.

I suspect Dennett fails to appreciate these concerns in part because his thinking is guided by a subtly misleading picture of adaptation. Dennett is fond of speaking of selection as leading organisms through "Design Space": Selection "lifts" organisms along "ramps" of good Design. Although this imagery is often useful, it invites two subtle misconceptions about adaptation. The first is that natural selection cares about Design. In reality, selection "sees" only brute birth, death, and reproduction, and knows nothing of Design. Selection -- sheer, cold demographics -- is just as happy to lay waste to the kind of Design we associate with engineering as to build it. Consider the eyes of cave organisms who live in total darkness. If eyes are expensive to make, selection can wreck their exquisite engineering just as surely as it built it. An optic nerve with little or no eye is most assuredly *not* the sort of design one expects on an engineer's blueprint, but we find it in *Gammarus minus*. Whether or not this kind of evolution is common, it betrays the fundamental error in thinking of selection as trading in the currency of Design.

Second, hazy imagery of selection lifting organisms along Design ramps makes it hard to see that selection sometimes moves individual traits *down* ramps. But this surely occurs. The reason is that selection lifts overall "fitness"; it is not in the business of enhancing the design of isolated traits. Adaptation is built from favorable mutations, but favorable mutations are just genetic changes that have *net* good effects. Such mutations needn't have happy effects on every trait they affect. Indeed, this is extremely unlikely. Consequently, adaptive changes may improve traits A and B at the expense of trait C. In a world of two steps forward and one step back, we have no reason to expect optimal Design everywhere. This fact has nothing to do with disreputable non-Darwinian forces "getting in the way" of adaptation. As evolutionary biologists have long understood, it *is* adaptation.

In the end, though, this gnashing of teeth over adaptationism is not supremely important to Dennett. Despite devoting a hefty portion of his book to this problem, Dennett is not ultimately concerned with how natural selection builds organisms. He has much bigger fish to fry.

Genes, Memes, & Cultural Evolution

Except to a handful of biologists, there is little "dangerous" in the idea that Biology is Engineering. There *is* something dangerous, though, in the idea that Darwinism transcends biology, undermining our views of culture, consciousness, and morality. Persuading us of this is Dennett's real agenda. Surprisingly, then, he is quite unclear about precisely how Darwinism transcends biology. Sometimes he suggests that Darwin's dangerous idea is that all Design -- whether natural or man-made -- is connected by lines of descent. But this is only trivially true. *Of course* all of our good ideas (and bad) spring from brains that sprang from lesser brains back to the primordial ooze. If this is Dennett's Big Idea, it is not only an enormous let-down, it is without consequence. One may as well marvel that all our ideas descend from the Big Bang. More often, though, Dennett goes whole hog and argues that all Design -- the spread of good ideas as well as clever adaptations -- reflects the same process, natural selection. Indeed, Dennett has long championed the notion that Darwinism might explain why some ideas and styles flourish while others perish.⁶ Darwinism thus explains not just the biological *origin* of consciousness and culture, but their changing *contents*.

But this leap from origin to content is extraordinarily problematic. Take, for example, the humble medium of radio. Its origin is explained by the laws of electricity and magnetism: no E&M, no radio. But who thinks that the changing content of radio -- the Sex Pistols *versus* Rush Limbaugh -- is described by Maxwell's equations? One does not invoke a "skyhook" when one says, "The laws of E&M do not go this far." One talks sense.

Now Dennett is an able philosopher and this argument is surely not news to him. So why is he ineluctably drawn to the view that cultural change involves some brand of Darwinism? The reason is that he believes natural selection is an "algorithmic process," a blind, formal procedure whose operation is guaranteed to return a certain kind of result. A defining property of an algorithmic process is its "substrate neutrality": An algorithm does a job and returns a result whatever the input. Dennett concludes that natural selection, as an algorithm, is also substrate neutral. One can select between genes on chromosomes, codes in a computer, or ideas in a culture. As long as mutation, replication, and differential survival occur, any substrate can be selected. For instance, ideas can change (mutate), they can spread (replicate), and some can die out while others persist (differential survival), so we would seem to have a substrate suited for selection. Following Dawkins, Dennett claims that the substrate that gets selected in cultural evolution is the "meme," any memorable idea, jingle, or fashion that lasts long enough to get copied by another person.

This substrate neutrality argument is supremely important to Dennett. It -- and nothing else -- explains why selection can be lifted from its historical base in biology. It is what makes Darwinism so dangerous. But Dennett slips here. While it is true that many different kinds of substrate can be selected, it is simply not true that Darwinism works with any substrate, no matter what. Indeed Darwinism can't even explain old-fashioned *biological* evolution if the hereditary substrate doesn't behave just right. Evolution would quickly grind to a halt, for instance, if inheritance were blending, not particulate. With blending inheritance, the genetic material from two parents seamlessly blends together like different colored paints. With particulate Mendelian inheritance, genes from Mom and Dad remain forever distinct in Junior. This substrate problem was so acute that turn-of-the-century biologists -- all fans of blending inheritance -- concluded that Darwinism just can't work. Modern evolutionary genetics was born in 1930 when Sir Ronald Fisher cracked this problem: Population genetics shows that particulate Mendelian inheritance saves the day. It is just the kind of substrate needed for evolution by natural selection to work.

What, then, about Dennett's memes -- all those "tunes, ideas, catch-phrases, clothes-fashions, ways of making pots or of building arches." Do they show particulate or blending inheritance? Do street fashion and high fashion segregate like good genes, or do they first mix before replicating in magazines or storefronts? Does postmodern architecture reflect a blending of the modernist and classical or the inheritance of distinct LeCorbusier and Vitruvius genes? I do not know the answers to these questions. And neither does Dennett. And neither does anyone else.

But it's worse than this. As Dennett reluctantly admits, memes and genes differ in other fundamental ways. Species, once isolated, almost never exchange genes, while exchange between long-isolated cultures is immensely important in the history of ideas. Moreover, new ideas -- but not genes -- are produced by a sort of directed mutation. Newton did not uncover the Fundamental Theorem of Calculus by conceiving millions of random ideas. In addition, the fitness of memes is strangely tautological. While we can often point to ecological reasons why certain genes are fitter than others, a meme is deemed "fit" only because it is common. ("Elvis is alive" is certainly a fit meme, but it is neither true nor helpful. It is merely popular.) Last, Dennett confesses that memes often show a *Lamarckian*, not Darwinian, style of evolution, in that acquired traits get passed along.

Despite Dennett's assurance, then, that "concepts from population genetics transfer quite smoothly" to "population memetics," it is far from clear that Darwinism can account for the percolation of ideas,

styles, and songs through culture. In fact, there is a basic problem with any such claim -- we are very ignorant of how humans hold ideas in their heads and of how the ideas in your head influence the ideas in my head. So how can we possibly conclude that the process "must be" Darwinian? As Searle emphasizes, it is this ignorance of how things actually work that makes the pretensions of these wild theories possible: "Such claims live in the holes of our knowledge."⁷

In light of these problems, how can Dennett be so confident of his Darwinian science of cultural evolution? Here's the real shocker: He isn't. Halfway through his book, Dennett confides that the "prospects for elaborating a rigorous science of memetics are doubtful." But he assures us that, "[w]hether or not the meme perspective can be turned into science, in its philosophical guise it has already done more good than harm." I confess that I am astonished by this move. Without question, the central tenet of Dennett's book is that Darwinism cannot and should not be confined to biology. As he repeatedly reminds us, the fact that selection is substrate-neutral allows a downward diffusion from biology *and* an "upward spread of universal acid through human culture." Indeed: "According to Darwin's dangerous idea, all possible explorations of Design Space are connected. Not only all your children and your children's children, but all your brainchildren and your brainchildren's brainchildren must grow from the common stock of design elements, genes and memes Life and all its glories are thus united under a single perspective."

Or at least this is what Dennett promised us. So what happened? Do we have a Darwinian explanation of our brainchildren or not? Are we left with a science of cultural evolution or a vaguely interesting half-analogy between genes and memes? The answer is clear: Dennett neither describes nor is confident of a Darwinian science of culture. He is in good company; Dawkins backed off his meme-talk long ago. Indeed his more recent (and very sensible) views on the limited usefulness of memes should be required reading for all would-be cultural Darwinists.⁸ Although Dennett never quite admits it, he has also backed off, as can be seen by comparing his 1990 article on "Memes and the Exploitation of Imagination" (see note 1) and his 1991 book *Consciousness Explained*⁹ with chapter 12 of *Darwin's Dangerous Idea*. Although he still talks up memes *ad libitum*, he now feels compelled to mention that maybe they're not so much like genes after all and (gulp) maybe they're not even Darwinian. They just provide a "valuable perspective." Given this denouement, Dennett's habit of ridiculing humanists for their reluctance to face the cold, hard facts of cultural Darwinism is incomprehensible. The fact is there is no such science.

Dennett also never comes clean about why his hoped-for cultural Darwinism failed to fly. He would have the naive reader believe that memetics was shot down by soft-headed humanists ("Darwin-dreaders") who panicked at the encroachment of science. Surely his readers deserve to know that many of the most trenchant criticisms of memetics came from scientists. Dennett's strategy seems clear. When attempting to intimidate humanist opponents, he is fond of rattling the saber of science. He is allied with the armies of Progress, and his foes are mushy poets. The problem with this strategy (aside from its arrogance) is that it assumes there really is some science underlying his views. How much more intimidating to swing the club of Darwinian science at one's opponents than to announce that you come armed with a useful "philosophical guise."

Given the gulf between his promise of a universal acid and his delivery of an anemic memes-as-a-valuable-perspective, it comes as no surprise that Dennett is a fan of the bait-and-switch strategy. This, he reminds us, is

[the] practice of attracting customers by advertising something at a bargain price and then, when you've lured them to the store, trying to sell them a substitute. Unlike that practice, evolutionary bait-and-switch is not really nefarious; it just seems to be, because it doesn't explain what at first you thought you wanted explained. It subtly changes the topic.

Evolution and Ethics

Pervading Dennett's discussion of ethics is a similar confusion about how far Darwinism extends. Here the pattern isn't so much bait-and-switch as bait-and-switch-and-switch. Dennett's argument careens through three stages:

1. Early on, we are treated to plenty of hype about how Darwinism undercuts many of our views of mind and ethics and "illuminates them in ways that have eluded the traditional approaches, recasting ancient problems and pointing to their solution." We are also enticed by chapter and section titles like "Can Ethics be Naturalized?" and "Redesigning Morality."
2. Surprisingly, Dennett then delivers a measured exposé of the excesses of human sociobiology. Many sociobiologists, he warns, commit the genetic fallacy, wherein one assumes that moral codes appeared "for the benefit of the genes." Dennett dutifully reminds us that the appearance of culture radically alters the rules of the game -- once memes arrive, they can call the shots. Indeed, people, "as a result of interactions between their meme-infested brains, are not at all bound to answer to the interests of their genes alone."
3. But Dennett suddenly lurches back to Darwin, asserting that, while culture renders the world more complex than many sociobiologists pretend, this means only that we must perform "a more careful inquiry" into the origins of morality. And what does this more careful inquiry look like? One thing is certain: It is genetic. Indeed it looks a lot like textbook sociobiology. Dennett explains that a "vivid way of posing the question is to imagine becoming an *artificial* selector of altruistic people" (his emphasis). But since God appears not to have performed this experiment for us, we must explain "the evolution of ethics by *natural* selection" (his emphasis). This occurs via the usual sociobiological steps. Building on care of progeny, selection encourages an investment in other relatives (so-called "kin selection"). Nothing controversial so far. But this must be followed by the far more difficult task of extending the moral circle to include all, kin or not. ("Thou shalt not kill" says nothing about relatedness.) Fortunately, a genetic theory of "reciprocal altruism" shows how such behavior can, in fact, evolve by natural selection.

It is probably unfair to brand this zig-zagging, "It's all Darwin . . . it's all culture . . ." argument bait-and-switch. I suspect that Dennett is genuinely unsure where to plant his feet. After passionately arguing that the memes of culture can snap the leash of genetic control, why abruptly argue that morality evolved via selection of genes?

I should make it clear that I am not troubled by the possibility that your civility (as well as mine) reflects ancient genetic changes. It may well. But the notion that the diffusion of morality among humans *must* have involved natural selection is absurd. Imagine, for instance, that evolution blessed our hirsute ancestors with consciousness and language. But, alas, these immoral brutes -- who are kind only to their families -- have run out of genetic variation and, thus, no further evolutionary change is possible. What reason is there to think that social contracts, cooperation among hunters, and the other ingredients of an *Ur*-morality couldn't catch on among these thinking, speaking beasts? None as far as I can see. Is it obvious that genetic changes are required for such a thing? Where are Dennett's trusty memes when we need them?

The deeper point, though, is that this navel-gazing -- these endless attempts to theoretically reconstruct what "must have" occurred during the emergence of human morality -- is no more than academic exercise. The ugly fact is that we haven't a shred of evidence that morality in humans did or did not evolve by natural selection. We do not even know what such evidence would look like. We can, if we like, construct plausible adaptive scenarios ("What would happen to a gene that said be nice to strangers

if . . ."). But, in the end, a thought experiment is not an experiment. We have no data.

Dennett's treatment of evolutionary ethics is symptomatic of the problem plaguing his entire book. He is forever suggesting that the universal acid of natural selection *may* be involved here or there. Natural selection of alternative universes may explain why we live in a world having just these physical constants (I spared you this one). Selection may explain the rise and fall of ideas and songs. Selection may explain why "strong" artificial intelligence is destined to work (nature got semantics out of syntax, so digital computers can too). Selection may explain the spread of ethical codes among humans. But at each milepost the skeptical reader grumbles, "But maybe not." After all, the evidence for each claim ranges from non-existent (alternative universes, origin of morality) to negative (Darwinian evolution of memes). All Dennett really shows is that -- if one squints hard enough -- one can sort of see how Darwin's dangerous idea *might* play a role in this, that, or the other. Although he has produced a provocative and intermittently entertaining book, Dennett's chief claim is unconvincing. Darwinism may have little to tell us outside of biology.

Dennett, ever optimistic, triumphantly concludes that "[t]here is no denying, at this point, that Darwin's idea is a universal solvent, capable of cutting right to the heart of everything in sight." Drawing his argument to a close, he quotes, with some approval, Nietzsche's bleak vision of a Nature ruled by an apathetic but omnipresent Darwinism:

"According to nature" you want to *live*? O you noble Stoics, what deceptive words these are! Imagine a being like nature, wasteful beyond measure, indifferent beyond measure, without purposes and consideration, without any mercy and justice, fertile and desolate and uncertain at the same time; imagine indifference itself as a power -- how *could* you live according to this indifference!¹⁰

But Nietzsche's real message about the Stoics -- which I suspect Dennett would rather you not hear -- is very different. It is, however, surprisingly relevant. In the next paragraph Nietzsche reverses himself:

In truth, the matter is altogether different: while you pretend rapturously to read the canon of your law in nature, you want something opposite, you strange actors and self-deceivers! Your pride wants to impose your morality, your ideal on nature -- even on nature -- and incorporate them in her; you demand that she should be nature "according to the Stoa" For all your love of truth, you have forced yourself so long, so persistently, so rigidly-hypnotically to see nature the wrong way, namely Stoically, that you are no longer able to see her differently But this is an ancient, eternal story: what formerly happened to the Stoics still happens today, too, as soon as any philosophy begins to believe in itself. It always creates the world in its own image; it cannot do otherwise.¹¹

It is perhaps understandable why Dennett -- so fond of creating Darwinian worlds of cosmology, culture, and mind -- chose not to quote the entire passage.

¹*The Riddle of the Universe at the Close of the Nineteenth Century* (New York: Harper and Brothers, 1901).

²Stephen J. Gould and Richard C. Lewontin, "The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme," *Proceedings of the Royal Society of London* 205 (1979): 581-598.

³See George C. Williams, *Natural Selection* (New York: Oxford University Press, 1992) for a discussion of this and other structural maladaptations in humans.

⁴John Maynard Smith, "Dinosaur Dilemmas," *New York Review of Books*, April 25, 1991, p.6.

⁵Motoo Kimura, *The Natural Theory of Molecular Evolution* (Cambridge, UK: Cambridge University Press, 1983)

⁶See his "Mememes and the exploitation of imagination," *Journal of Aesthetics and Art Criticism* 48 (1990):127-135.

⁷John R. Searle, *Minds, Brains and Science* (Cambridge, MA: Harvard University Press, 1984).

⁸Richard Dawkins, *The Extended Phenotype* (Oxford: W.H. Freeman and Company, 1982), pp. 111-112.

⁹(Boston: Little, Brown and Company), pp. 199-210

¹⁰Friedrich Nietzsche, *Beyond Good and Evil*, trans. Walter Kaufmann (New York: Vintage Books, 1966), p.15.

¹¹*Beyond Good and Evil*, pp. 15-16.

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