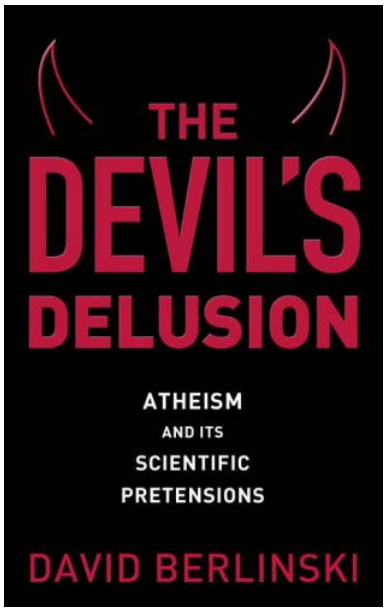
Book Review



David Berlinski

The Devil's Delusion:
Atheism and Its Scientific Pretensions

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Books have in recent years poured from every press proclaiming, in a wide variety of styles and degrees of naïveté, that religious beliefs must be false because scientific theories are true. Yet if science stands opposed to religion, it is not because of anything contained in either the premises or the conclusions of the great scientific theories. "Confident assertions by scientists that in the privacy of their chambers they have demonstrated that God does not exist have nothing to do with science, and even less to do with God's existence," Berlinski concludes.

David Berlinski is a secular Jew. His religious education did not take. He can barely remember a word of Hebrew. He cannot pray. He has spent more years than he cares to remember in studying mathematics and writing about the sciences. Yet his latest book, *The Devil's Delusion*, is in some sense a defense of religious thought and sentiment.

In all those confident assertions, Berlinksi goes on to say, two influential ideas are at work: "The first is that there is something answering to the name of science. The second is that something answering to the name of science offers sophisticated men and women a coherent vision of the universe." The second claim is false if the first claim is, and Berlinski makes it plain that the first claim *is* false. "Like *democracy* or *justice*, *science* is a word exhausted by its examples."

The theories that we possess — such as Maxwell's electrodynamics, Einstein's theories of relativity, and quantum mechanics — comprise a "tantalizingly inconsistent scheme of things," the distinguished mathematician Roger Penrose observed. I would add that

they comprise a tantalizingly inconsistent scheme of things *if and only if* we try to straitjacket them into a naturalistic framework of thought. In any case, Berlinski is certainly right that "[t]hese splendid artifacts of the human imagination have made the world more mysterious than it ever was. We know better than we did what we do not know and have not grasped."

> We may allow ourselves in the early twenty-first century to neglect the Red Sea and to regard with unconcern the various loaves and fishes mentioned in the New Testament. We who are heirs to the scientific tradition have been given the priceless gift of a vastly enhanced sense of the miraculous. This is something that the very greatest scientists — Newton, Einstein, Bohr, Gödel — have always known and always stressed. (207)

No scientific theory touches on the mysteries that the religious tradition addresses. The answers that prominent scientific figures have offered are remarkable in their shallowness. So much is obvious. What is less certain is that "what the religious traditions of mankind have said forms a coherent body of thought." It seems to me that what these traditions have given us is glimpses of a coherent and experientially accessible reality quite *beyond* the ken of rational thought.

> The yearnings of the human soul are not in vain. There is a system of belief adequate to the complexity of experience. There is recompense for suffering. A principle beyond selfishness is at work in the cosmos. All will be well. I do not know whether any of this is true. I am certain that the scientific community does not know that it is false. (xiv)

The **first** of the book's ten chapters deals, effectively and with savage humor, with the scientism of certain militant atheists and their minions. To begin with, according to molecular geneticist Dean Hamer, a person's capacity to believe in God is linked to his brain chemicals.

> Perhaps it will not be amiss to observe that Dr. Hamer has made the same claim about homosexuality, and if he has refrained from arguing that a person's capacity to believe in molecular genetics is linked to a brain chemical, it is, no doubt, owing to a prudent sense that once that door is open, God knows how and when anyone will ever slam it shut again. (9)

In the course of an essay denouncing not only theology but poetry and philosophy as well, Peter Atkins, a professor of physical chemistry at Oxford University, observes favorably of his ilk that scientists "are at the summit of knowledge, beacons of rationality, and intellectually honest." Given that science is, after all, "the apotheosis of the intellect and the consummation of the Renaissance,… there is no reason to suppose that science cannot deal with every aspect of existence."

> [These declarations] are absurd; they are understood to be absurd; and what is more, assent is demanded just because they are absurd. "We take the side of science in spite of the patent absurdity of some of its constructs," the geneticist Richard Lewontin remarked equably in *The New York Review of Books*, "in spite of its failure to fulfill many of its extravagant promises of health and life, in spite of the tolerance of the scientific community for unsubstantiated just-so stories." (9)

We are to put up with science's unsubstantiated just-so stories because, Lewontin explains, "we cannot allow a Divine Foot in the door!"

> If one is obliged to accept absurdities for fear of a Divine Foot, imagine what prodigies of effort would be required were the rest of the Divine Torso found wedged at the door and with some justifiable irritation demanding to be let in?
>
> If nothing else, the attack on traditional religious thought marks the consolidation in our time of science as the single system of belief in which rational men and women might place their faith, and if not their faith, then certainly their devotion.... And like any militant church, this one places a familiar demand before all others: Thou shalt have no other gods before me. (9–10)

A great many men and women are frustrated by endless scientific boasting.

> They suspect that as an institution, the scientific community holds them in contempt. They feel no little distaste for those speaking in its name. They are right to feel this way.

Having cast doubt on the cathedral-like grandeur of science in the first chapter, Berlinski addresses the alleged depravity of religion in the **second**. In 2007, a number of scientists gathered at a conference titled *Beyond Belief: Science, Religion, Reason, and Survival* "in order to attack religious thought and congratulate one another on their fearlessness in so doing." In his address, Nobel winning physicist Steven Weinberg declared that "Religion is an insult to human dignity. With or without it you would have good people doing good things and evil people doing evil things. But for good people to do evil things, that takes religion."

> In speaking thus, Weinberg was warmly applauded, not one member of his audience asking the question one might have thought pertinent: Just who has imposed on the suffering human race poison gas, barbed wire, high explosives, experiments in eugenics, the formula for Zyklon B, heavy artillery, pseudo-scientific justifications for mass murder, cluster bombs, attack submarines, napalm, intercontinental ballistic missiles, military space platforms, and nuclear weapons? If memory serves, it was not the Vatican. (21)

In *The End of Faith*, Sam Harris recounts in lurid and lingering detail the methods of torture used in the Spanish Inquisition.

> There is no need to argue the point. A great deal of human suffering has been caused by religious fanaticism.... Nonetheless, there is this awkward fact: The twentieth century was not an age of faith, and it was awful. Lenin, Stalin, Hitler, Mao, and Pol Pot will never be counted among the religious leaders of mankind. (19)

Psychologist Steven Pinker has claimed that "something in modernity and its cultural institutions has made us nobler.... On the scale of decades, comprehensive data ... paint a shockingly happy picture." To document this "shockingly happy picture," Berlinski lists some 65 events from 1914 to the present along with the number of excess deaths incurred, and concludes:

> In considering Pinker's assessment of the times in which we live, the only conclusion one can profitably draw is that such an excess of stupidity is not often to be found in nature. (25)

It seems to me that Pinker nonetheless had a point. "Cruelty as entertainment," he wrote,

> "human sacrifice to indulge superstition, slavery as a labor-saving device, conquest as the mission statement of government, genocide as a means of acquiring real estate, torture and mutilation as routine punishment, the death penalty for misdemeanors and differences of opinion, assassination as the mechanism of political succession, rape as the spoils of war, pogroms as outlets for frustration, homicide as the major form of conflict resolution — all were unexceptionable features of life for most of human history." (22)

Pinker may be wrong in claiming that these things "are rare to nonexistent in the West" and "far less common elsewhere than they used to be," but it appears to be a fact that they are now more "widely condemned when they are brought to light."

Be that as it may. One might think that the Holocaust would above all other events give the scientific atheist pause. Hitler's Germany was a technologically sophisticated secular society, and Nazism itself, as party propagandists never tired of stressing, was "motivated by an ethic that prided itself on being scientific." The words are those of the historian Richard Weikart, who in his treatise *From Darwin to Hitler: Evolutionary Ethics, Eugenics, and Racism in Germany* made clear what anyone capable of reading the German sources already knew:

> A sinister current of influence ran from Darwin's theory of evolution to Hitler's policy of extermination. A generation of German biologists had read Darwin and concluded that competition between species was reflected in human affairs by competition between races. These observations find no echo at all in the literature of scientific atheism. Christopher Hitchens is prepared to denounce the Vatican for the ease with which it diplomatically accommodated Hitler, but about Hitler, the Holocaust, or the Nazis themselves he has nothing to say. (27)

For praise or for blame, what links religion (or the absence thereof) to the bipolarity of right and wrong is *morality*. The eleventh-century Arab philosopher Abu Hamid Muhammad Al Ghazâli, writing about the scientists he called naturalists, predicted that if "there does not remain any reward for obedience, or any punishment for sin," then men and women will give way to "a bestial indulgence of their appetites." In *The Brothers Karamazov*, Ivan Karamazov exclaims that if God does not exist, then everything is permitted. "The problem," philosopher Simon Blackburn writes, "is one of … placing ethics within the disenchanted, non-ethical order which we inhabit, and of which we are a part!" Blackburn, of course, is convinced that his chief obligation in facing this question "is above all to refuse appeal to a supernatural order." For Berlinski, this

> is rather as if an accomplished horseman were to decide that his chief task were to learn to ride without a horse. If moral statements are about something, then the universe is not quite as science suggests it is, since physical theories, having said nothing about God, say nothing about right or wrong, good or bad. To admit this would force philosophers to confront the possibility that the physical sciences offer a grossly inadequate view of reality. And since philosophers very much wish to think of themselves as scientists, this would offer them an unattractive choice between changing their allegiances or accepting their irrelevance. These are familiar questions in philosophy, and if they have been long asked, they have remained long unanswered. David Hume asked in the eighteenth century whether *ought* could be derived from *is*, and concluded that it could not. (35–36)

Richard Dawkins appears to think that there is no need for an *ought*. "Perhaps," he speculates, "I am a Pollyanna to believe that people would remain good when unobserved and unpoliced by God." Berlinksi wonders: "Do people remain good when unpoliced by the police?" I am inclined to think that when a person has reached a certain *spiritual* — rather than merely moral — development, God's function as supernatural policeman ceases, for

> ethics is a stage in evolution. That which is common to all stages is the urge of [the immanent deity] towards self-expression. This urge is at first non-ethical, then infra-ethical in the animal, then in the intelligent animal even anti-ethical for it permits us to approve hurt done to others which we disapprove when done to ourselves. In this respect man even now is only half-ethical. And just as all below us is infra-ethical, so there may be that above us whither we shall eventually arrive, which is supra-ethical, has no need of ethics. The ethical impulse and attitude, so all-important to humanity, is a means by which it struggles out of the lower harmony and universality based upon inconscience and broken up by Life into individual discords towards a higher harmony and universality based upon conscient oneness with all existences. Arriving at that goal, this means will no longer be necessary or even possible, since the qualities and oppositions on which it depends will naturally dissolve and disappear in the final reconciliation. (Sri Aurobindo, *The Life Divine*, 2005, p. 104)

In the **third** chapter Berlinski expands on his claim that there really isn't anything answering to the name of science. The "scientific method" is the first thing to which members of the scientific community appeal when they are under attack:

> It is then that the determination is made that members of the public have failed to understand the scientific method or properly to revere it. No effort need be made actually to exhibit the method or tie it to an argument. (55)

Consider the following staple account of this method:

1. Observe some aspect of the universe.
2. Form a hypothesis that potentially explains what you have observed.
3. Make testable predictions from that hypothesis.
4. Make observations or experiments that can test those predictions.
5. Modify your hypothesis until it is in accord with all observations and predictions.

Let me see if I get it:

1. I notice a greenish-grayish blob in the woods.
2. It could be a frog.
3. If it's a frog and I approach it, it will hop away.
4. I approach it. It doesn't hop away.
5. It's a dead frog. Eureka!

The above staple account turns out to be an account of the common-sense approach to problem solving. It is *not* an account of anything particularly scientific. How does the method fare in an actual scientific context? Take quantum mechanics, the fundamental theoretical framework of contemporary physics. Its mathematical formalism is a collection of computational tools. You may think of them as machines with inputs and outputs. You insert (i) a mathematical representation of a measurement M that you

intend to make, (ii) the time of *M*, and (iii) mathematical representations of relevant measurement outcomes previously obtained, and out pop the probabilities of the possible outcomes of *M*. Now why is the fundamental theoretical framework of physics concerned with *measurements* of physical quantities rather than the physical quantities themselves? Why does it let us predict the *probabilities* of the possible outcomes of a measurement but not the actual outcome? Few physicists or philosophers of science believe that they have the answers, and fewer still believe the answers that have been proposed. So much for the scientific method.

What is missing in all this is the insight that science operates within an interpretative framework that formulates questions and interprets answers, and that this interpretative framework is not testable by any means that would qualify as "scientific." Yet philosopher Michael Devitt, to mention but one, continues to proclaim that "there is only one way of knowing, the empirical way that is the basis of science!"

> An argument against religious belief follows at once on the assumptions that theology is not science and belief is not knowledge. If by means of this argument it also follows that neither mathematics, the law, nor the greater part of ordinary human discourse have a claim on our epistemological allegiance, they must be accepted as casualties of war.
>
> Declarations of this sort have been common in the history of philosophy since the eighteenth century. In *An Enquiry Concerning Human Understanding*, David Hume argued that "if we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames: For it can contain nothing but sophistry and illusion!"… Whatever the vigor with which Hume advanced his views, arguments such as his when self-applied self-destruct. Hume's remarks, after all, contain neither "abstract reasoning concerning quantity or number" nor "experimental reasoning concerning matters of fact and existence." (57)

Big bang cosmology forms the subject of the **fourth** chapter, which concludes with the following paragraph:

> "Perhaps the best argument in favor of the thesis that the Big Bang supports theism," the astrophysicist Christopher Isham has observed, "is the obvious unease with which it is greeted by some atheist physicists. At times this has led to scientific ideas, such as continuous creation or an oscillating universe, being advanced with a tenacity which so exceeds their intrinsic worth that one can only suspect the operation of psychological forces lying very much deeper than the usual academic desire of a theorist to support his or her theory." (81)

The book's **fifth** chapter reflects on the cause (if any) of the universe and the reason (if any) for its existence.

Taking for granted that a "cause must precede its effect," Berlinski argues that "if the universe is eternal, there was no moment in which God could have brought about the creation of the universe." Two errors are contained in this line of reasoning. As Berlinski is well aware, the Big Bang is not an event in time. It encompasses both our past and our present: whether we peer some 13 billion years into the past or some 13 billion light years into the distance, we are blinded by something beyond which there is

neither space nor time. In fact, since beyond it there is neither space nor time, we cannot speak of anything "beyond" it (in either a spatial or a temporal sense). The first error is that the Big Bang provides God with a moment *in time* to bring about the creation of the universe. The second error is that God needs such a moment to bring about the creation of the universe. We are confronted with the paradoxical situation that the universe *has* this boundary which we call the Big Bang, and that nothing exists *behind* this boundary because we cannot speak of anything "behind" it (in either a spatial or a temporal sense). We are of course free to situate the Creation event at this boundary or even, metaphorically speaking, behind it, but then it is "before" time as well as "beyond" space. We cannot naively situate it *in* the past.

The Big Bang's theoretical home, Einstein's general theory of relativity, stands aloof from the rest of physics, which is grounded in quantum mechanics. The latter, according to Berlinski,

> commits the physicist to a form of legerdemain that has to this day resisted all attempts at explication. It is one thing to say that a wave may pass through two slits; it is quite another thing to say that a single particle may divide its allegiance in just the same way. Nonetheless, this is just what physicists were forced to say. By now, they say it without a second thought. . . .the particle enjoys a doubling of its position in space, with each position corresponding to a distinct physical state. Somehow both physical states are real and they are real at the same time. They are, as physicists say, superimposed. (92)

Berlinski is obviously stymied by the usual gibberish about quantum mechanics. The quantum-mechanical wave function is one of those computational tools I mentioned earlier. If one transmogrifies it into a physical state, this kind of nonsense is the result. As physicist Nico van Kampen warned: "Whoever endows [the wave function] with more meaning than is needed for computing observable phenomena is responsible for the consequences." More nonsense follows, but let it be understood that this is not Berlinski's fault. Everyone listening to the average quantum physicist is bound to come away with such impressions.

> So long as no one is looking, the electron is all things to all men. But let the physicist have a look, and *boom!* the particle that could be here *and* there becomes here *or* there all over again. The wave packet collapses into just one of its possibilities. The other quantum states that it embodies vanish, and they vanish instantaneously. (93–94)

Regarding the notion that a measurement might be complete only in the mind of the observer, van Kampen wrote with rare and commendable common sense: "I find it hard to understand that someone who arrives at such a conclusion does not seek the error in his argument." What Berlinski has assembled in this chapter is a vivid tableau of scientific inanities, designed to compare unfavorably with the worst theological absurdities. Some further examples:

> "If we are to be honest," [Atkins] argues, "then we have to accept that science will be able to claim complete success only if it achieves what many might think impossible: accounting for the emergence of everything from absolutely nothing." Atkins does not seem to recognize that when the human mind encounters the thesis that something has emerged from nothing, it is not encountering a question to which any coherent answer

> exists. His confidence that a scientific answer must nonetheless be forthcoming needs to be assessed in other terms, possibly those involving clinical self-delusion. (95–96)

> Proposing to show how something might emerge from nothing, [physicist Victor Stenger] introduces "another universe [that] existed prior to ours that tunneled through … to become our universe. Critics will argue that we have no way of observing such an earlier universe, and so this is not very scientific." This is true. Critics will do just that. Before they do, they will certainly observe that Stenger has completely misunderstood the terms of the problem that he has set himself, and that far from showing how something can arise from nothing, he has shown only that something might arise from something else. This is not an observation that has ever evoked a firestorm of controversy. (97)

> The many-worlds interpretation [of quantum mechanics] is rather like the incarnation. It appeals to those who believe in it, and it rewards belief in proportion to which belief is sincere. (100)

> Arguments follow from assumptions, and assumptions follow from beliefs, and very rarely — perhaps never — do beliefs reflect an agenda determined entirely by the facts. No less than the doctrines of religious belief, the doctrines of quantum cosmology are what they seem: biased, partial, inconclusive, and largely in the service of passionate but unexamined conviction. (103–104)

The **sixth** chapter is devoted to the Anthropic Principle and related avoidance reactions. "Scientists," physicist Paul Davies observed,

> "are slowly waking up to an inconvenient truth — the universe looks suspiciously like a fix. The issue concerns the very laws of nature themselves. For 40 years, physicists and cosmologists have been quietly collecting examples of all too convenient 'coincidences' and special features in the underlying laws of the universe that seem to be necessary in order for life, and hence conscious beings, to exist. Change anyone of them and the consequences would be lethal." (110–111)

These arguments are very much of a piece with those that astrophysicist Fred Hoyle advanced after studying the resonances of carbon during nucleosynthesis. "The universe," he concluded, "looks like a put-up job."

> An atheist, Hoyle did not care to consider who might have put the job up, and when pressed, he took refuge in the hypothesis that aliens were at fault. In this master stroke he was joined later by Francis Crick. When aliens are dropped from the argument, there remains a very intriguing question: Why do the constants and parameters of theoretical physics obey such tight constraints? (111)

During the 1980s, physicist Alan Guth argued that the early universe was characterized by a period of exponential inflation.

> Very soon after it blew up in the first place, it blew up again. When suitably blown up, it stopped blowing up. The Stanford physicist André Linde carried this idea a step further in his theory of eternal chaotic inflation. Universes are blowing up all over the place. They cannot stop themselves. (122)

Not to be outdone, string theorists blew up the whole shebang all over again: "physicists and cosmologists are coming to see our ten billion light years as an infinitesimal pocket of a stupendous megaverse," physicist Leonard Susskind wrote. Welcome to the

Landscape! The question of why the ultimate laws of nature are true, and why the numerical parameters have the values that they do, now has a trivial answer. The Landscape has room for universes with every possible set of laws and every possible assortment of numerical parameters. Living things that we are, we need not be surprised to find ourselves in a universe that is just right for life.

> The Landscape and the Anthropic Principle represent the accordance of moral relativism in physical thought. They work to cancel the suggestion that the universe — our own, the one we inhabit — is any kind of put-up job. This is their emotional content, the place where they serve prejudice. (134)

But Susskind also wrote this:

> "If, for some unforeseen reason, the landscape turns out to be inconsistent — maybe for mathematical reasons, or because it disagrees with observation — I am pretty sure that physicists will go on searching for natural explanations of the world. But I have to say that if that happens, as things stand now we will be in a very awkward position. Without any explanation of nature's fine-tunings we will be hard pressed to answer the ID [intelligent design] critics. One might argue that the hope that a mathematically unique solution will emerge is as faith-based as ID." (135)

In the **seventh** chapter Berlinski turns his biting wit on Dawkins' Boeing-747 gambit. The spontaneous emergence of life on earth, Fred Hoyle once observed, is about as likely as a tornado sweeping through a junkyard and assembling a Boeing 747 out of the debris. Since Hoyle's scenario expresses with rare economy the odds favoring the spontaneous appearance of life, it has been an irritation to Dawkins ever since it made its appearance. Eventually he came up with this: if a tornado cannot do the job of creating life, then God cannot do the job of creating the universe.

> The tornado is inadequate because life is improbable, and God is inadequate for the same reason. This counterstroke has persuaded Dawkins that he has initiated an intellectual maneuver judo-like in its purity of effect and devastating in its consequences. (141)

Taking his cue from the Master, molecular geneticist Emile Zuckerkandl argues that

> "if complexity is a problem for naturalistic explanations, the Higher Intelligence [invoked by ID theorists] itself is first to have to face this problem. Intelligent Design thus does not solve any problem posed by complexity; it only transposes the origins of complexity from the observable to an unobservable world and makes these origins inaccessible to inquiry." (143)

This leaves me wondering: What is it that makes Zuckerkandl's Higher Intelligence a *higher* intelligence? I would consider it natural for a higher intelligence not to be limited by the incapacities and/or incomprehensions of a lower intelligence. Should counting be a problem for us just because dogs aren't good at it? "Less demanding critics," Berlinski instead comments,

> might observe that shoveling problems backward until they are out of sight is not only the tactic of common sense but the only tactic in common use. When scientists appeal to various unobservable entities — universal forces, grand symmetries, twice-differentia[ble] functions as in mechanics, Calabi-Yau manifolds, ionic bonds, or quantum fields — the shovel is in plain sight, but what is to be shoveled is nowhere to be seen.

> Why physicists should enjoy inferential advantages denied theologians, Zuckerkandl does not say. (143)

A pertinent remark, given physicists' penchant for transmogrifying computational tools into bona fide physical entities.

In the remainder of the chapter, Berlinski appears to me to spend way too much of his valuable mental energy on debunking a definition: if X is unlikely (the *definiendum*), then X probably does not exist (the *definiens*).

> The inference that Dawkins proposes to champion has as its premise the claim that God is improbable; its conclusion is that likely God does not exist. The inferential bridge invoked by the 747 gambit, if it goes anywhere at all, goes from what God is (He is unlikely) to whether He exists (it would appear not). Inferences of this sort are typically not deductive: they do not impart certainty to their conclusions. (144–145)

Any conception of a contingent deity, Thomas Aquinas had argued, is doomed to fail, for however He might help explain the existence of the universe, His own existence would again require an explanation. "Therefore," Aquinas concluded, "not all beings are merely possible, but there must exist something the existence of which is necessary."

> The conclusion that a religious believer will take from Dawkins's argument is either that God is improbable or that He is *necessary*. (151)

Never mind Dawkins; Aquinas' conclusion looks to me like a rational extension of anthropic reasoning. Living things that we are, it is apodictic that we find ourselves in a universe capable of supporting life. By the same token, existing as we do (as thinking subjects or conscious selves if nothing else), we cannot possibly deny existence itself — the fact that *something* exists, rather than nothing at all. For in denying our own existence, we also deny our denial of the same. Think about it. Try it. Like a powerful Zen *koan*, it may lead you straight to the realization of your inmost self as the ground of both consciousness and being. I mean it.

In the **eight** chapter of *The Devil's Delusion*, Berlinski takes on Darwinian reductionism. Alfred Wallace, who together with Charles Darwin created the theory of evolution that now goes by the latter's name, observed that there is no evident distinction between the mental powers of the most primitive human being and the most advanced.

> Raised in England instead of the Ecuadorian Amazon, a native child of the head-hunting Jivaro … would learn to speak perfect English, and would upon graduation from Oxford or Cambridge have the double advantage of a modern intellectual worldview and a commercially valuable ethnic heritage. He might become a mathematician, he would understand the prevailing moral and social codes perfectly, and for all anyone knows (or could tell), he might find himself a BBC commentator, explaining lucidly the cultural significance of head-hunting and arguing for its protection. (158–159)

From this, Wallace drew the conclusion that characteristic human abilities must be latent in primitive man. But the idea that a biological species might possess latent powers makes no sense in Darwinian terms. It suggests the forbidden doctrine that evolutionary advantages were frontloaded far away and long ago. To set the record straight, or at least a little less bent, it ought to be mentioned that Darwin actually

went farther than Wallace. This one discovers if one reads *The Descent of Man* with a mind not made up in advance by a neo-Darwinian indoctrination.[1] "I have been led to put together my notes, so as to see how far the general conclusions arrived at in my former works were applicable to man," Darwin wrote in the Introduction. What he saw may be gleaned from the fact that only twice in the entire book of 475 fine-print pages does the phrase "survival of the fittest" appear, and once to apologize for ever using it! He does continue to stress the scientific evidence for the impact of natural selection and the drive of selfishness. But he goes on to insist that "other agencies" become of much greater importance at our level of evolutionary emergence. For Darwin the prime driver for human evolution was and is not natural selection, or "survival of the fittest," but our capacity for the "moral sense," i.e., moral sensitivity, an evolutionary inbuilt thrust within us for the development of a sense of right versus wrong. On the penultimate page of the section labeled "Concluding Remarks," he stresses this:

> Important as the struggle for existence has been and even still is, yet as far as the highest part of our nature is concerned there are other agencies more important. For the moral qualities are advanced either directly or indirectly much more through the efforts of habit, by our reasoning powers, by instruction, by religion, etc., than through natural selection.

It's a pity Berlinski missed this. In contemporary culture the kinship between human beings and the apes — promoted as both a moral virtue and a zoological fact — functions as a hedge against religious belief, and so it is eagerly advanced. E.g.: "Intense competition between great apes, as described both by Homer and by primatologists, frequently boils down to precisely the same thing: access to females." Berlinski comments: "The governing words in this quotation are "boils down" and as in so many such analyses, what is essential is not what has been distilled but what has evaporated. That is, everything of interest in the *Iliad*."

To affirm, as Wallace did, that human beings are fundamentally unlike the apes is widely considered a politically incorrect prejudice. Darwin went farther than Wallace, who simply recognized a persistent obstacle to the reduction of human virtues to animal instincts, in that he effectively turned the tables on reductionism. Animal instincts are human virtues in the process of emergence. As Sri Aurobindo wrote,

> The significance of the lotus is not to be found by analysing the secrets of the mud from which it grows here; its secret is to be found in the heavenly archetype of the lotus that blooms for ever in the Light above.

The main target of the **ninth** chapter is the God of the Gaps.

> As a rhetorical contrivance, the God of the Gaps makes his effect contingent on a specific assumption: that whatever the gaps, they will in the course of scientific research be filled. It is an assumption both intellectually primitive and morally abhorrent — primitive because it reflects a phlegmatic absence of curiosity — and abhorrent because it assigns to our intellectual future a degree of authority alien to human experience.

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[1] See David Loye, "To Darwin: A Birthday Manifesto" and "Will the Real Charles Darwin Please Stand Up?" in this and the previous issue of *AntiMatters*, respectively.

I, for one, wouldn't want to live in a universe that is so boring as to be humanly comprehensible. Thank God I don't.

> Western science has proceeded by filling gaps, but in filling them, it has created gaps all over again. The process is inexhaustible. (183–184)

Almost every scientific discovery raises more questions than it answers. The number of unanswered questions grows faster than the number of answered ones. Our ignorance grows faster than our knowledge.

Suspicions about Darwin's theory — not of evolution but of the *mechanism* of evolution — arise for two reasons: the theory makes little sense, and it is supported by little evidence.

> In his very long posthumous treatise, *The Structure of Evolutionary Theory*, Stephen Jay Gould explained "the bare bones" of natural selection in this way: "Organisms enjoying differential reproductive success will, on average, be those variants that are fortuitously better adapted to changing local environments." Those variants that are "better adapted" are, of course, precisely those "enjoying differential reproductive success." What else could they be? Biologists believe that tautologies play an unsuspected role in scientific thought and are for this reason worthy of respect.... As one might expect, a theory whose assumptions are empty may be widely confirmed by evidence whose relevance is negligible. (187)

In a research survey published in 2001, the evolutionary biologist Joel Kingsolver reported that in sample sizes of more than one thousand individuals, there was virtually no correlation between specific biological traits and either reproductive success or survival. "Important issues about selection," he remarked with some understatement, "remain unresolved."

> Of those important issues, I would mention prominently the question whether natural selection exists at all. Computer simulations of Darwinian evolution fail when they are honest and succeed only when they are not. Thomas Ray has for years been conducting computer experiments in an artificial environment that he has designated Tierra.... Sandra Blakeslee, writing for the *New York Times*, reported the results under the headline "Computer 'Life Form' Mutates in an Evolution Experiment: Natural Selection Is Found at Work in a Digital World."
>
> Natural selection found at work? I suppose so, for as Blakeslee observes with solemn incomprehension, "the creatures mutated but showed only modest increases in complexity." Which is to say, they showed nothing of interest at all. This *is* natural selection at work, but it is hardly work that has worked to intended effect. What these computer experiments *do* reveal is a principle far more penetrating than any that Darwin ever offered: There is a sucker born every minute. (190)

If Darwin's theory of evolution has little to contribute to the content of the sciences, it has much to offer their ideology.

> It serves as the creation myth of our time, assigning properties to nature previously assigned to God. It thus demands an especially ardent form of advocacy. In this regard, Daniel Dennett, like Mexican food, does not fail to come up long after he has gone down. "Contemporary biology," he writes, "has demonstrated beyond all reasonable doubt that natural selection — the process in which reproducing entities must compete for finite

> resources and thereby engage in a tournament of blind trial and error from which improvements automatically emerge — has the power to generate breathtakingly ingenious designs."
>
> These remarks are typical in their self-enchanted self-confidence. Nothing in the physical sciences, it goes without saying — *right?* — has been demonstrated beyond all reasonable doubt. The phrase belongs to a court of law. . . .
>
> The greater part of the debate over Darwin's theory is not in service to the facts. Nor to the theory. The facts are what they have always been: They are unforthcoming. And the theory is what it always was: It is unpersuasive. Among evolutionary biologists, these matters are well known. In the privacy of the Susan B. Anthony faculty lounge, they often tell one another with relief that it is a very good thing the public has no idea what the research literature really suggests. "Darwin?" a Nobel laureate in biology once remarked to me over his bifocals. "That's just the party line."

In the summer of 2007, Eugene Koonin, of the National Center for Biotechnology Information at the National Institutes of Health, published a paper entitled "The Biological Big Bang Model for the Major Transitions in Evolution."

> "Major transitions in biological evolution," Koonin writes, "show the same pattern of sudden emergence of diverse forms at a new level of complexity".
>
> Major transitions in biological evolution? These are precisely the transitions that Darwin's theory was intended to explain. . . . "The relationships between major groups within an emergent new class of biological entities," Koonin goes on to say, "are hard to decipher and do not seem to fit the tree pattern that, following Darwin's original proposal, remains the dominant description of biological evolution." The facts that fall outside the margins of Darwin's theory include "the origin of complex RNA molecules and protein folds; major groups of viruses; archaea and bacteria, and the principal lineages within each of these prokaryotic domains; eukaryotic supergroups; and animal phyla." That is, pretty much everything. . . .
>
> "In each of these pivotal nexuses in life's history," he goes on to say, "the principal 'types' seem to appear rapidly and fully equipped with the signature features of the respective new level of biological organization. No intermediate 'grades' or intermediate forms between different types are detectable." (192–193)

Yet it has been

> by an appeal to those intermediate forms that a very considerable ideology has been created. To doubt their existence is to stand self-accused. To go further and suggest that they are, in fact, imaginary evokes a frenzy of fearful contempt so considerable as to make civilized discourse impossible. Koonin's views do not represent the views of the Darwinian establishment. If they did, there would be no Darwinian establishment. They are not uncontested. And it may well be that they are exaggerated. Koonin is nonetheless both a serious biologist and a man not well known for a disposition to self-immolation. (193–194)
>
> It is in this context that Daniel Dennett's assertion that natural selection has been demonstrated "beyond all reasonable doubt" must be judged for what it is: It is the ecclesiastical bull of a most peculiar church, a cousin in kind to an ecclesiastical bluff. When Steven Pinker affirms that "natural selection is the only explanation we have of how

> complex life can evolve, he is very much in the inadvertent position of the apostles. Much against his will, he is bearing witness.
>
> In all this, it is the reaction among the faithful that provokes no surprise. Within minutes of the publication of Koonin's paper, a call for censorship went up over the Internet.... Whatever the degree to which Darwin may have "misled science into a dead end," the biologist Shi V. Liu observed in commenting on Koonin's paper, "we may still appreciate the role of Darwin in helping scientists [win an] upper hand in fighting against the creationists." (196–197)

It thus appears that "the God of the Gaps occupies a very considerable comfort zone in biology." Indeed, reductionist science has "*no* idea whatsoever how the ordered physical, moral, mental, aesthetic, and social world in which [we] live could have ever arisen from the seething anarchy of the elementary particles." None whatsoever.

> No one has the faintest idea whether the immense gap between what is living and what is not may be crossed by any conceivable means. It is therefore no surprise that the National Academy of Sciences has taken pains to affirm that it has already been crossed. "For those who are studying aspects of the origin of life, the question no longer seems to be whether life could have originated by chemical processes involving non-biological components but, rather, what pathway might have been followed." The view among biochemists actively engaged in research is different.... The theories that we have do what they can do, and then they stop. They do not stop because a detail is missing; they stop because we cannot go on. Difficulties are accommodated by the magician's age-old tactic of misdirection. (202)