

GOD, THE DEVIL, AND DARWIN

A CRITIQUE OF INTELLIGENT
DESIGN THEORY

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Foreword

Who owns the argument from improbability? Statistical improbability is the old standby, the creaking warhorse of all creationists from naive Bible-jocks who don't know better, to comparatively well-educated Intelligent Design "theorists," who should. There is no other creationist argument (if you discount falsehoods like "There aren't any intermediate fossils" and ignorant absurdities like "Evolution violates the second law of thermodynamics"). However superficially different they may appear, under the surface the deep structure of creationist advocacy is always the same. Something in nature—an eye, a biochemical pathway, or a cosmic constant—is too *improbable* to have come about by *chance*. Therefore it must have been *designed*. A watch demands a watchmaker. As a gratuitous bonus, the watchmaker conveniently turns out to be the Christian God (or Yahweh, or Allah, or whichever deity pervaded our particular childhood).

That this is a lousy argument has been clear ever since Hume's time, but we had to wait for Darwin to give us a satisfying replacement. Less often realized is that the argument from improbability, properly understood, backfires fatally against its main devotees. Conscientiously pursued, the statistical improbability argument leads us to a conclusion diametrically opposite to the fond hopes of the creationists. There may be good reasons for believing in a supernatural being

(admittedly, I can't think of any) but the argument from design is emphatically not one of them. The argument from improbability firmly belongs to the evolutionists. Darwinian natural selection, which, contrary to a deplorably widespread misconception, is the very antithesis of a chance process, is the only known mechanism that is ultimately capable of generating improbable complexity out of simplicity. Yet it is amazing how intuitively appealing the design inference remains to huge numbers of people. Until we think it through . . . which is where Niall Shanks comes in.

Combining historical erudition with up-to-date scientific knowledge, Professor Shanks casts a clear philosopher's eye on the murky underworld inhabited by the "intelligent design" gang and their "wedge" strategy (which is every bit as creepy as it sounds) and explains, simply and logically, why they are wrong and evolution is right. Chapter follows chapter in logical sequence, moving from history through biology to cosmology, and ending with a cogent and perceptive analysis of the underlying motivations and social manipulation techniques of modern creationists, including especially the "Intelligent Design" subspecies of creationists.

Intelligent design "theory" (ID) has none of the innocent charm of old-style, revival-tent creationism. Sophistry dresses the venerable watchmaker up in two cloaks of ersatz novelty: "irreducible complexity" and "specified complexity," both wrongly attributed to recent ID authors but both much older. "Irreducible complexity" is nothing more than the familiar "What is the use of half an eye?" argument, even if it is now applied at the biochemical or the cellular level. And "specified complexity" just takes care of the point that any old haphazard pattern is as improbable as any other, *with hindsight*. A heap of detached watch parts tossed in a box is, with hindsight, as improbable as a fully functioning, genuinely complicated watch. As I put it in *The Blind Watchmaker*, "complicated things have some quality, *specifiable in advance*, that is highly unlikely to have been acquired by random chance alone. In the case of living things, the quality that is specified in advance is, in some sense, 'proficiency'; either proficiency in a particular ability such as flying, as an aero-engineer might admire it; or proficiency in something more general, such as the ability to stave off death. . . ."

Darwinism and design are both, on the face of it, candidate explanations for specified complexity. But design is fatally wounded

by infinite regress. Darwinism comes through unscathed. Designers must be statistically improbable like their creations, and they therefore cannot provide an ultimate explanation. Specified complexity is the phenomenon we seek to explain. It is obviously futile to try to explain it simply by specifying even greater complexity. Darwinism really does explain it in terms of something simpler—which in turn is explained in terms of something simpler still and so on back to primeval simplicity. Design may be the temporarily correct explanation for some particular manifestation of specified complexity such as a car or a washing machine. But it can never be the ultimate explanation. Only Darwinian natural selection (as far as anyone has ever been able to discover or even credibly suggest) is even a *candidate* as an ultimate explanation.

It could conceivably turn out, as Francis Crick and Leslie Orgel once facetiously suggested, that evolution on this planet was seeded by deliberate design, in the form of bacteria sent from some distant planet in the nose cone of a space ship. But the intelligent life form on that distant planet then demands its own explanation. Sooner or later, we are going to need something better than actual design in order to explain the illusion of design. Design itself can never be an ultimate explanation. And the more statistically improbable the specified complexity under discussion, the more unlikely does any kind of design theory become, while evolution becomes correspondingly more powerfully indispensable. So all those calculations with which creationists love to browbeat their naïve audiences—the mega-astronomical odds against an entity spontaneously coming into existence by chance—are actually exercises in eloquently shooting themselves in the foot.

Worse, ID is lazy science. It poses a problem (statistical improbability) and, having recognized that the problem is difficult, it lies down under the difficulty without even *trying* to solve it. It leaps straight from the difficulty—“I can’t see any solution to the problem”—to the cop-out—“Therefore a Higher Power must have done it.” This would be deplorable for its idle defeatism, even if we didn’t have the additional difficulty of infinite regress. To see how lazy and defeatist it is, imagine a fictional conversation between two scientists working on a hard problem, say A. L. Hodgkin and A. F. Huxley who, in real life, won the Nobel Prize for their brilliant model of the nerve impulse.

“I say, Huxley, this is a terribly difficult problem. I can’t see how the nerve impulse works, can you?”

“No, Hodgkin, I can’t, and these differential equations are fiendishly hard to solve. Why don’t we just say give up and say that the nerve impulse propagates by Nervous Energy?”

“Excellent idea, Huxley, let’s write the Letter to *Nature* now, it’ll only take one line, then we can turn to something easier.”

Huxley’s elder brother Julian made a similar point when, long ago, he satirized vitalism as tantamount to explaining that a railway engine was propelled by *Force Locomotif*.

With the best will in the world, I can see no difference at all between *force locomotif*, or my hypothetically lazy version of Hodgkin and Huxley, and the really lazy luminaries of ID. Yet, so successful is their “wedge strategy,” they are coming close to subverting the schooling of young Americans in state after state, and they are even invited to testify before congressional committees: all this while ignominiously failing to come up with a single research paper worthy of publication in a peer-reviewed journal.

Intelligent Design “theory” is pernicious nonsense which needs to be neutralized before irreparable damage is done to American education. Niall Shanks’s book is a shrewd broadside in what will, I fear, be a lengthy campaign. It will not change the minds of the wedgies themselves. Nothing will do that, especially in cases where, as Shanks astutely realizes, the perceived moral, social, and political implications of a theory are judged more important than the truth of that theory. But this book will sway readers who are genuinely undecided and honestly curious. And, perhaps more importantly, it should stiffen the resolve of demoralized biology teachers, struggling to do their duty by the children in their care but threatened and intimidated by aggressive parents and school boards. Evolution should not be slipped into the curriculum timidly, apologetically or furtively. Nor should it appear late in the cycle of a child’s education. For rather odd historical reasons, evolution has become a battlefield on which the forces of enlightenment confront the dark powers of ignorance and regression. Biology teachers are front-line troops, who need all the support we can give them. They, and their pupils and honest seekers after truth in general, will benefit from reading Professor Shanks’s admirable book.

Richard Dawkins

Preface

A culture war is currently being waged in the United States by religious extremists who hope to turn the clock of science back to medieval times. The current assault is targeted mainly at educational institutions and science education in particular. However, it is an important fragment of a much larger rejection of the secular, rational, democratic ideals of the Enlightenment upon which the United States was founded. The chief weapon in this war is a version of creation science known as *intelligent design theory*.

The aim of intelligent design theory is to insinuate into public consciousness a new version of science—supernatural science—in which the God of Christianity (carefully not directly mentioned for legal and political reasons) is portrayed as the intelligent designer of the universe and its contents. Its central proponents are often academics with credentials from, and positions at, reputable universities. They are most assuredly not the cranks and buffoons of the church hall debating circuit of yesteryear who led the early assaults on science and science education. But the ultimate aim is the same.

The proponents of intelligent design are openly pursuing what they call a wedge strategy. First, get intelligent design taught alongside the natural sciences. Once the wedge has found this crack and gained respectability, it can be driven ever deeper to transform the

end of the educational enterprise itself into a system more open with respect to its aim of religious instruction. As the wedge is driven still deeper, it is hoped that the consequent cracks will spread to other institutions, such as our legal and political institutions. At the fat end of the wedge lurks the specter of a fundamentalist Christian theocracy. This book, however, is about the thin end of the wedge: supernatural science. Ultimately, it is about two basic questions: Is intelligent design theory a scientific theory? Is there any credible evidence to support its claims?

My own experience with creationism and creation science goes back to 1996, when I had the pleasure of engaging in a public debate with Duane Gish of the Institute for Creation Research. The debate took place at East Tennessee State University, even as the Tennessee State Legislature debated the Burks-Whitson Bill to restrict the teaching of evolution in Tennessee schools. The debate in the legislature made Tennessee an international laughingstock. My debate took place about ninety miles from Dayton, Tennessee, where the infamous Scopes trial occurred, thereby showing that even those who know history are condemned to repeat it—again and again!

Teaching evolutionary biology in one of the Bible Belt's many buckles, I have had many close classroom encounters with ideas derived from creationism and creation science (including intelligent design theory). A sadly humorous account of my pedagogical trials and tribulations can be found in my essay, "Fighting for Our Sanity in Tennessee: Life on the Front Lines" (2001a). My concerns about intelligent design theory, however, run deeper than a simple worry about educational policy. Intelligent design theory represents, from the standpoints of both methodology and content, a serious challenge to the outlook of modern science itself. This is a challenge that needs to be taken seriously and not dismissed.

Accordingly, my colleague Karl Joplin and I have been engaged in a series of academic exchanges in various journals with biochemist Michael Behe, the author of *Darwin's Black Box: The Biochemical Challenge to Evolution* (see Behe 2000, 2001a; Shanks and Joplin 1999, 2000, 2001a, 2001b). I have also had an exchange with academic lawyer Phillip Johnson in the pages of the journal *Metascience* (Johnson 2000b; Shanks 2000). Johnson and Behe are the leading lights of the modern intelligent design movement in the United States (they are both senior members of the Discovery Institute), and we will

meet them both again, later in this book. Needless to say, I was delighted when Peter Ohlin of Oxford University Press contacted me in the spring of 2002 to invite me to write a book about intelligent design theory.

In writing this book, I had the help of several friends and colleagues. First and foremost, I must give a special note of thanks to Professor Richard Dawkins, who kindly read the manuscript and honored me by writing the foreword to this volume. I must also thank my good friend Otis Dudley Duncan, who was a source of inspiration and constructive criticism throughout this project. Dudley read by night what I wrote by day, and in this way I got a much better first draft than I deserved.

I also offer my thanks to the following friends and colleagues who read fragments of the manuscript or had valuable discussions with me: David Sharp, George Gale, David Close, Steve Karsai, Dan Johnson, Rebecca Pyles, Jim Stewart, Bob Gardner, Keith Green, Bev Smith, Mark Giroux, Don Luttermoser, Hugh LaFollette, Rebecca Hanrahan, Marie Graves, Matt Young, Taner Edis, John Hardwig, Massimo Pigliucci, and Mark Perakh. I have also benefited from many helpful discussions with members of the Scirel (science and religion) discussion group organized by Jeff Wardeska here at East Tennessee State University. I am also grateful to Julia Wade and the members of the adult Sunday school at First Presbyterian Church in Elizabethton, Tennessee. These good people made an unbeliever welcome and kindly commented on a series of lectures I gave on these matters in the long, hot summer of 2002.

I would also like to give a special note of thanks to my friend and long-time collaborator, Karl Joplin, with whom I have authored several essays critical of intelligent design theory. Karl and I have taught classes together here in Tennessee, where the issues raised in this book have a special life of their own. Finally, I would like to thank Peter Ohlin at Oxford University Press for all his help in bringing this project to fruition.

Introduction

The Many Designs of the Intelligent Design Movement

Of God, the Devil, and Darwin, we have really good scientific evidence for the existence of only Darwin. Religious extremists, however, see Darwin's work (and subsequent developments in evolutionary biology) as the inspired work of the Devil, and a larger number of Christians, not so extreme in their views, claim to see in nature evidence of providential intelligent design by God.

The systematic study of nature with a view to making discoveries about God was known in the eighteenth century as natural theology. In the last half of the twentieth century, this enterprise, coupled with a literalist interpretation of the Bible as a true and accurate account of natural history and its beginnings, came to be known as creation science.

Yet in the process of becoming creation science, natural theology has mutated and evolved into a grim parody of itself. Where the natural theologians of old were in awe of the grandeur of nature, reveled in the discoveries of natural science, and saw the Book of Nature as a supplementary volume to the Book of God, the contemporary creation scientist feels compelled to substitute for the Book of Nature as we now know it a grotesque work of science fiction and fantasy, so that consistency may be maintained between preferred interpretations of the two books. The dangers here were recognized long ago, for

as natural theologian Thomas Burnet (1635–1715) pointed out, “Tis a dangerous thing to ingage the authority of Scripture in disputes about the Natural World, in opposition to reason lest Time, which brings all things to light, should discover that to be evidently false which *we had made Scripture to assert*” ([1691] 1965, 16, my italics).

Following Burnet’s lead, it is worth pointing out right here that one way in which we make Scripture—or any other text, for that matter—assert things is through interpretation. Biblical literalists might claim that they are reading the Bible the one true way that God intended it to be read, but merely saying this does not make it so. Many of the creationists who claim to be literalists actually have little more than a crude interpretation of the King James Version of the Bible, itself an interpretation of earlier writings and one that reflects the experiences of its seventeenth-century English authors. Yet even if one moves beyond the seventeenth century to the earliest surviving biblical writings, they still require interpretation. It is the reader who renders writings meaningful. Were Adam and Eve literally created together, as told in Genesis 1, or was Adam literally created first, and then Eve later, as told in Genesis 2? In the end, it really is all a matter about what we make Scripture assert. Decisions have to be made, and this process includes the decision to attach the stamp of divine authority to interpretations of the text that one finds congenial.

Politics and Religious Fundamentalism

The contemporary attacks on secular science and secular science education are fragments of a larger rejection of the secularism that has come to pervade modern democratic societies in the West. Though the United States is rightly considered the home of creation science, creationists have gained significant footholds outside the United States in countries such as Australia, Canada, and the United Kingdom. Indeed, the last three decades of the twentieth century have witnessed a massive global resurgence in religious fundamentalism of all stripes. While we in the West readily point a finger at Islamic fundamentalism, we all too readily downplay the Christian fundamentalism in our own midst. The social and political consequences of religious fundamentalism can be enormous, as evidenced by the plight of Iranians under the ayatollahs, the Israelis and Palestinians, the

Afghans under the Taliban, Protestants and Catholics at each others' throats in Northern Ireland, and campaigns of terror and intimidation waged against women's centers here in the United States.

Closer to home, there are growing concerns that the inability of the United States to formulate a rational foreign policy with respect to the Middle East reflects, in no small measure, pressure from Christian extremists who believe that support for the Israelis will accelerate the return of Christ. Dispensationalist theology, dating back to John Nelson Darby in 1830, teaches that before Christ's return, there will be a war in the Middle East against the restored nation of Israel. The establishment of the Jewish state in 1948 was seen as a vindication of dispensationalist claims. Now, apparently, God needs Washington's help to keep the predictions on track. However, as Doug Bandow of the Cato Institute has observed in connection with the biblical basis of this kind of end times theology:

Curiously, there's no verse explaining that to bless the Jewish people or to be kind to them means doing whatever the secular government of a largely nonreligious people wants several thousand years later. This is junk theology at its worst. Or almost worst. Sen. James Inhofe (R-Okla) said in a speech last March: "One of the reasons I believe the spiritual door was open for an attack against the United States of America is that the policy of our government has been to ask the Israelis, and demand it with pressure, not to retaliate in a significant way against terrorist strikes that have been launched against them." (www.cato.org/dailys/06-04-02.html)

As Bandow observes, none other than Jerry Falwell has declared that God has been kind to America because "America has been kind to the Jews." After the events of 9/11, some prominent Christians blamed the attacks on the spiritual decline of the US, and suggested that God had withdrawn his protection.

For Falwell, the solution is clear: "You and I know there is not going to be any real peace in the Middle East until one day the Lord Jesus Christ sits on the Throne of David in Jerusalem" (*New York Times*, October 6, 2002). According to journalist Paul Krugman, Representative Tom DeLay, House leader and one of the most powerful people in Congress, has asserted, "Only Christianity offers a way to live in response to the realities we find in this world—only Christianity." As Krugman goes on to note: "After the Columbine school shootings, Mr. DeLay suggested that the tragedy had occurred,

‘because our school systems teach our children that they are nothing but glorified apes who have evolutionized [sic] out of some primordial mud.’ Guns don’t kill people, Charles Darwin kills people” (*New York Times*, December 17, 2002). Thus we see that the current assaults on science education in the United States are really the tip of a much larger religious fundamentalist iceberg, an iceberg capable of sinking rather more than school curricula.

The consequences of religious fundamentalism are far from trivial. In recent years, we have seen how important avenues of medical research—for example, research involving stem cells, cloning, and embryonic human tissue—have been subjected to political restrictions as part of a strategy to pander to religious extremists. The result of such pandering is that crucial areas of biomedical research are now *not* being conducted in the United States. The attempts over the last three decades to restrict the teaching of evolution or to require that evidentially ungrounded theological alternatives be taught alongside it are not just peculiarities of educational policy; they are manifestations of a much deeper underlying problem generated by the resurgence of fundamentalist ideology.

Intelligent Design Theory

In the last decade of the twentieth century, creation science has spawned something called *intelligent design theory*, which preserves the core of creation science—the claim that the world and its contents result from supernatural intelligent design—while shearing away much of the biblical literalism and explicit references to God that were characteristic of the creation science from which it descends. The result has been termed *stealth creationism*—the less God is mentioned explicitly, the more likely it is that intelligent design theory will eventually fly under secular legal radar and bomb an increasingly fragile system of public education. Intelligent design theory has serious academic proponents at reputable universities, and because of clever marketing, it is having a growing influence in debates about education at local, state, and national levels. It is, in fact, a *wedge* seeking cracks in our secular democratic institutions. And intelligent design theorists themselves have made much of the metaphor of the wedge.

In this book, I explain what intelligent design theory is, where it came from, and how it is currently being presented to the public as part of a broad strategy not just to reintroduce religion into school curricula but also as a challenge to the very foundations of the modern secular state. I argue that although intelligent design theory has broad appeal to those in the sway of both Christian and Islamic fundamentalism (and as we shall see, there are some interesting ties between these two species of religious extremists), it represents a serious threat to the educational, scientific, and philosophical values of the Enlightenment that have helped to shape modern science and our modern democratic institutions. Some proponents of intelligent design theory have been quite open about this last point.

The threat to the values of the Enlightenment inherent in the intelligent design movement is particularly clear in Phillip Johnson's *Reason in the Balance: The Case against Naturalism in Science, Law and Education*. Others, more clearly identifiable than Johnson as religious extremists, have also been open about their rejection of Enlightenment values. Kent Hovind, for example, who runs Creation Science Ministries in Florida and promulgates theories favored by the antigovernment groups, maintains, "Democracy is evil and contrary to God's law" (*Intelligence Report*, Southern Poverty Law Center, Summer 2001, Issue 102). In the United States, recent events in the context of public debates about educational policy in Kansas and Ohio illustrate the growing political influence of proponents of intelligent design.

But what exactly is intelligent design theory? Since the sins of the father are occasionally visited upon the children, it will not go amiss here to begin with an examination of the creation science movement that gave rise to modern intelligent design theory. The first thing worth noting is that while virtually all creation scientists are united in their opposition to secular evolutionary biology (and many are equally repelled by theistic versions of evolution, such as those versions of evolutionary thought that see in evolutionary phenomena the unfolding of God's plan), they disagree among themselves on a wide array of other matters.

Young Earth creationists, for example, maintain that the universe is some 6,000 to 10,000 years old. Modern science, by contrast, estimates the age of the universe at something around fourteen billion years, with the Earth forming some four and a half billion years ago.

Young Earth creationists typically have to reject rather more than just evolutionary biology to fit what we see into their truncated chronology. Vast tracts of modern physics and chemistry, not to mention geology and anthropology, must be largely in error if these theorists are correct. In fact, by seeing the biblical chronology and the events and peoples depicted in the Bible as true and accurate depictions of history, these creationists must also reject many well-established archaeological facts about human history (Davies 1992, 1998; Finkelstein and Silberman 2001; Thompson 1999). In the United States, the Institute for Creation Research (ICR) in California is a leading center for this species of creationism.

While young Earth creationists take the biblical chronology very literally, they are forced to go to fanciful lengths to accommodate modern scientific discoveries. For example, the story of Noah's Ark looms large in many of these religious fantasies, where it is often presented as a genuine zoological rescue mission. In some versions, even the dinosaurs entered the ark two by two. We are told that humans and dinosaurs lived together and that the Grand Canyon was scooped out by a tidal wave during the Great Flood. Mount Ararat, the resting place for Noah's Ark (the Holy Grail sought by numerous creationist expeditions to modern Turkey), is viewed as the source of post-Flood biodiversity, with koala bears presumably following a fortuitous trail of eucalyptus leaves all the way to Australia (then joined, perhaps, to South America, but moving rather quickly ever since). The Jurassic Ark must have been a mighty vessel indeed.

Young Earth creationism, however, has attracted many religious extremists, and it is in this context that one sees the claim developed that evolution is the work of the Devil. Henry Morris of ICR has said of evolution that "the entire monstrous complex was revealed to Nimrod at Babel and perhaps by Satan himself. . . . Satan is the originator of the concept of evolution" (1974, 74–75). And from Nimrod the line of wicked descent presumably runs to Darwin and his contemporary intellectual heirs in the scientific community who refuse to give God, angels, and an assortment of demonic bogeymen a place alongside electrons, quarks, gravitational fields, and DNA in the scientific account of natural phenomena.

Recent investigations have uncovered connections between young Earth creationists at the ICR and Islamic fundamentalists—though after the events of 9/11, these groups would no doubt not

like to have this resurface in a public forum. For our purposes, the Turkish experience can be seen as a warning of the dangers that accompany efforts by religious extremists who are bent on the destruction of a secular government. It should serve as an alarm call to those of us in the United States who have so far been silent about the steady erosion of the wall of separation between church and state—a process of erosion that has been accelerated by politicians at local, state, and national levels, who either have their own extreme religious agendas or who have shown themselves to be all too willing to pander to extreme religious voices for the sake of expediency.

Turkish scholars Ümit Sayin and Aykut Kence have noted of the BAV (the Turkish counterpart of the ICR) that:

BAV has a long history of contact with American creationists, including receiving assistance from ICR. Duane Gish and Henry Morris visited Turkey in 1992, just after the establishment of BAV, and participated in a creationist conference in Istanbul. Morris, the former head of ICR, became well acquainted with Turkish fundamentalists and Islamic sects during his numerous trips to Turkey in search of Noah's Ark. BAV's creationist conferences in April and June 1998 in Istanbul and Ankara, which included many US creationists, developed after Harun Yahya started to publish his anti-evolution books, which were delivered to the public free of charge or given away by daily fundamentalist newspapers. (1999, 25)

Sayin and Kence go on to observe that BAV, though it uses anti-evolution arguments developed by the ICR, has its own unique Islamic objectives; this has been echoed by Taner Edis (1999) in his examination of the relations between ICR and BAV. We should not underplay the significance of these links between ICR and BAV, for Turkey is a major NATO ally.

According to Arthur Shapiro (1999), the links between the ICR and Islamic extremists in Turkey were forged as part of a strategy by extremists in Turkey to undermine the nation's secular government. Shapiro has shown that ICR materials have been adapted to Islamic ends as part of a concerted attack on secular science in particular and secular belief in general. What of ICR's role in all this? Shapiro asks:

Does ICR care that its Turkish friends are using its materials and assistance to destabilize Turkey? Does it have any concern about the potential effect of political creationism in Turkey on the future of

NATO or the stability of the Eastern Mediterranean? . . . Its own materials suggest either complete disingenuousness or incredible naïveté. The ICR's *Impact* leaflet number 318, published in December 1999, presents its work in Turkey as an effort to bring the Turks to Christ. But the Turks with whom the ICR is working have little interest in coming to Christ. They are too busy trying to come to power. (1999, p. 16)

Whatever the initial motives were in joining hands with Islamic fundamentalists, it appears that in the hands of Islamic creationists, ICR's anti-Darwinism involves much more than a rejection of secular biological science. It involves a rejection of secular politics and the secular society that supports it.

This last point is supported by an examination of the writings of Islamic creation scientists such as Harun Yahya. Yahya is quite explicit about the alleged connection between Darwinism and secular ideologies as diverse as fascism and communism. In his book, *Evolution Deceit: The Scientific Collapse of Darwinism and Its Ideological Background*, in addition to parroting many fallacious claims about science that appear to descend with little modification from ICR positions (notably absent are ICR claims about the Great Flood), he argues, in curious ecumenical tones, that Darwinism is at the root of religious terrorism, be it done in the name Christianity, Islam, or Judaism:

For this reason, if some people commit terrorism using the concepts and symbols of Islam, Christianity and Judaism in the name of those religions, you can be sure that those people are not Muslims, Christians or Jews. They are real Social Darwinists. They hide under the cloak of religion, but they are not genuine believers. . . . That is because they are ruthlessly committing a crime that religion forbids, and in such a way as to blacken religion in peoples' eyes.

For this reason the root of terrorism that plagues our planet is not any of the divine religions, but is in atheism, and the expression of atheism in our times: "Darwinism" and "materialism." (2001, 19–20)

While it is hard to credit deception on this scale—even self-deception—the theme is one that will resonate with creationists and other Christian extremists in the United States. That is, religion is never to be assessed in terms of its objective consequences, and secularism (Darwinism in the context of science education) is the root of all evil.

Subtler links to Islam can be found in the context of the intelligent design movement. Muzaffar Iqbal, president of the Center for Islam and Science, has recently endorsed work by intelligent design theorist William Dembski. According to the Web page for the Center for Islam and Science, Islam recognizes the unity of all knowledge: "This is based on the concept of *Tawhid*, Unicity of God, which is the most fundamental principle of Islamic epistemology." The idea that scientific knowledge is unified through knowledge of God is an idea that resonates with intelligent design theorists in the West, who, as we shall see, would like to make it a fundamental principle of Christian epistemology. There is nothing sinister here, save a common interest, crossing religious boundaries, in blurring the distinction between science and religion. Of more concern is the fact that the boundaries to be blurred are boundaries between particular conceptions of science and particular conceptions of religion that both scientists and religious believers may reasonably reject.

Getting closer to home, not all creationists in the West subscribe to young Earth creationism. Thus, old Earth creationists, some through an artful interpretation of the *days* mentioned in Genesis 1 and 2 and some through a genuine respect for the discoveries of modern science, maintain that the Earth is of great antiquity. Old Earth creationists have even welcomed talk of a cosmological big bang, provided that it was an event initiated by God, with subsequent events representing, perhaps, the unfolding of the divine plan. Ideas along these lines can be seen in the writings of some of the cosmological proponents of intelligent design theory, and we will discuss them at length later in the book.

But if these believers in the rock of ages disagree about the age of rocks, it nevertheless remains the case that it is against this background of contradictory views about creation that the modern intelligent design movement manifested itself in the early 1990s. Phillip Johnson, who is the architect of the intelligent design movement, is the intelligent designer of something called the wedge strategy. Johnson (2000a, 13) invites us to imagine that our way is blocked by a large, heavy log. To pass it, we must break it up into pieces. To break it up into pieces, we must find cracks in the log, and drive wedges into these cracks. The wedges will split the log. Natural science is this log that, according to Johnson, is barring our way to Jesus.

Natural science is seen as barring the way to Jesus because it is said to be thoroughly contaminated by a pernicious philosophy known as naturalism. Johnson observes:

The Wedge of my title is an informal movement of like-minded thinkers in which I have taken a leading role. Our strategy is to drive the thin end of our Wedge into the cracks in the log of naturalism by bringing long-neglected questions to the surface and introducing them to public debate. Of course the initial penetration is not the whole story, because the Wedge can only split the log if it thickens as it penetrates. (2000a, 14)

At the thinnest end of the wedge are questions about Darwinism. As the wedge thickens slightly, issues about the nature of intelligent causation are introduced. As the wedge thickens still further, the interest in intelligent causation evolves into an interest in supernatural intelligent causation. At the fat end of the wedge is a bloated evangelical theology. As Johnson himself observes:

It is time to set out more fully how the Wedge program fits into the specific Christian gospel (as distinguished from generic theism), and how and where questions of biblical authority enter the picture. As Christians develop a more thorough understanding of these questions, they will begin to see more clearly how ordinary people—specifically people who are not scientists or professional scholars—can more effectively engage the secular world on behalf of the gospel. (2000a, 16)

Reading Johnson's words, I am drawn to think not of woodcutters and their wedges but of the older kids who hang around schoolyards, peddling soft drugs so that a taste for the harder stuff will follow.

For the dark side of the wedge strategy, lurking at the fat end of the wedge, lies in the way that it is intelligently designed to close minds to critical, rational scrutiny of the world we live in. The wedge strategy describes very well the very process whereby, beginning with mild intellectual sedatives, religion becomes the true opiate of the masses. As Johnson makes clear (2000a, 176), once the wedge is driven home, even the rules of reasoning and logic will be have to be adjusted to sit on theological foundations. In this way, critical thinking and opposition will not just be hard but literally unthinkable!

In this book, I am concerned mainly with the issues at the thin end of the wedge, where there are three basic issues. First, there is opposition to the philosophy of naturalism; second (and related to

this), there is opposition to evolutionary biology; and, third, there are positive arguments for introducing into science supernatural intelligent causes of natural phenomena. The postulation of such intelligent causes predates the rise of modern science, appearing most notably in the context of medieval Christian theology as the conclusion of an argument for the existence of God, called the *argument from design*. In a way, the thin end of the wedge can be thought of as an expression of the distilled essence of creation science, the veritable wheat minus the chaff, for it is what is left when the silliness about Noah's Ark, global floods, and Fred Flintstone scenarios concerning the coexistence of humans and dinosaurs are scattered to the winds.

Christianity and Creationism

Before I move to consider these issues, I would like to make some observations about science and religion, and Christianity in particular. First, it is false that all Christians are creationists or advocates of creation science. It is false that all Christians are religious extremists. It is also false that all Christians are intelligent design theorists. Indeed, many are deeply offended by such a suggestion. Christianity as we know it today manifests considerable diversity with respect to belief. Creationists and religious fundamentalists most assuredly do not speak for all Christians, though all too often it is the extreme voice of creationists that is heard in public debate.

Importantly, many strands of the diverse cultural fabric of the Christian community have indeed found ways to accommodate science and religion. Such strands include, but are not limited to, Roman Catholics, Episcopalians, Anglicans, Methodists, and Presbyterians. For many Christians, belief in God is about how to go to heaven, and not how the heavens go. In these terms, it is a gross abuse of the Bible, and a truly wretched theology, to think of it as a science primer. And not just Christianity but other religions, too, including Judaism, Islam, and Buddhism, have found ways to have both religion and science and hence to live in the modern world that we all must share, notwithstanding our diverse beliefs.

Phillip Johnson knows this, and he knows that many Christians believe that God works through evolution. Johnson is dismissive. In

a reply to criticisms from Cassandra Pinnick and myself, he claimed, “The deep conflict cannot be papered over with superficial solutions such as interpreting the ‘days’ of Genesis as geological ages or viewing evolution as God’s chosen means for bringing about his objectives. . . . God-guided evolution isn’t really evolution at all, as scientists use the term; it might better be called *slow creation*” (2000b, 102). He adds: “Sure, you can accept neo-Darwinism and still be “religious”—in a sense. We all know about Dobzhansky, Teilhard, and liberal bishops like John Shelby Spong. But is the theory consistent with the beliefs held by so many that a supernatural being called God brought about our existence for a purpose? That question deserves something better than a cynical evasion” (2000b, 103).

It is true that some adherents of Christianity have indeed a strong propensity to cast the character of their religious beliefs so that they inevitably conflict with science. But science and religion have been coevolving since the events precipitating the rise of modern science took place in the Renaissance. I will relate part of this history in the next chapter. For the present, it is worth noting that there are serious theological alternatives to the religious conservatism that Johnson seems so keen to champion. The advice I gave Johnson—from a good source—back in my review of his work (2000) still seems to be on the mark: first cast out the beam out of thine own eye; and then shalt thou see clearly to cast out the mote out of thy brother’s eye.

At this point I must be blunt with you. I am an atheist, and by this I mean that I am someone who does not believe that there is any credible evidence to support belief in the existence of God. By a similar light, I am also an *asantaclausist* and an *aeasterbunnyist*. And I regret to inform you that I have no particular solution to the problem of reconciling science and religion. Sadly, I very much doubt that the problem has a universally acceptable rational solution. Those most in need of such a solution are the very ones incapable of appreciating any such solution, were it to be discovered and offered. We have just seen that the likes of Phillip Johnson have no time for the reasonable Christian folk who have found ways to have their religion and nevertheless accept the results of modern science. You are more likely to reconcile the Israelis and the Palestinians or the Protestants and Catholics in Northern Ireland than you are to come to a universally agreeable solution to the problem of the reconciliation of science and religion.

Nevertheless, it is surely a testimony to the power of science envy in our culture that religious extremists have found it necessary to invent religious versions of science to serve their ends. The supreme irony, of course, is that in passing off their religious views as scientific, intelligent design theorists and creationist fellow travelers seek to ruin the very sciences in whose respectability they try to cloak themselves. The label is appropriated only to be destroyed. Whether we have any reason to take the various proposals for a supernatural science seriously is examined in the course of this book.

The Structure of the Book

In the next chapter, I will examine the argument from design to show where it came from and how it is supposed to work. I will argue that there are two fundamental kinds of design argument. One concerns complex, adapted structures and processes in biology; the other concerns the universe as a whole. Both arguments involve topics about which there are gaps in our current scientific knowledge. I will show how the argument from design, far from being undercut by the rise of modern science, was in fact bolstered by it. I will also discuss some early critical reactions to the argument due, among others, to David Hume and Immanuel Kant. This will provide the backdrop for what follows in the remainder of the book.

In chapter 2, I will examine Darwin's response to the traditional biological version of the argument from design. In addition to examining the details of evolutionary theory, I will also discuss Darwin's attitudes toward religion. This will also be an opportunity to examine developments in evolutionary biology in the 144 years since *The Origin of Species* was first published in 1859. Among the topics discussed will be the impact of genetics on evolutionary biology and recent research bringing together issues in evolution with issues in developmental biology.

In chapter 3, I turn my attention to thermodynamics—partly because errors about the meaning of the Second Law of Thermodynamics pervade creationist literature and partly because the recent study of nonequilibrium thermodynamics has revealed how natural mechanisms, operating in accord with natural laws, can result in the phenomenon of self-organization, whereby physical systems organize

themselves into complex, highly ordered states. In addition to evolutionary mechanisms studied by biologists, there are thus other natural sources of ordered complexity operating in the universe. A person ignorant of such mechanisms might well conclude that supernatural causes are in operation where there are in fact none.

Before turning to examine modern design arguments, we need to be clearer about intelligent design theory, its so-called wedge strategy, and what it sees itself as opposing. Supernatural science is thus the subject of chapter 4. One of the central issues to be discussed concerns claims that there are supernatural causes operating in nature to bring about effects beyond the reach of natural causes. Such conclusions, if established, would point to a deficiency in the philosophy of naturalism. Roughly speaking, this is the view that the only legitimate business of science is the explanation of natural phenomena in natural terms; put slightly differently, such causes as there are of natural effects must themselves be natural, as opposed to supernatural. Intelligent design theorists make much of naturalism and its deficiencies. But it is unclear whether the natural sciences, as opposed to particular natural scientists with extrascientific agendas, are actually committed to naturalist philosophy.

Scientists do tend to focus on the search for natural causes for effects of interest, but perhaps this involves less of a prior commitment to a naturalistic philosophy (most scientists in my experience—exceptions duly noted—couldn't give a hoot for philosophy anyway) and is more a reflection of the collective experience of scientists of all stripes over the last 300 years of modern science. We simply have not seen convincing evidence for conclusions supporting the operation of supernatural causes in nature. On this view, while scientists do not categorically reject the possibility of supernatural causation, they do not take it seriously at present either, primarily because of a complete lack of convincing evidence. On this view, the naturalism of the natural sciences may be methodological, reflecting long experience sifting evidence to support causal explanations, rather than philosophical or metaphysical, reflecting intellectual bias ruling out the very possibility of supernatural causation prior to the onset of investigations, the arrival of data, and its subsequent interpretation.

To sharpen these issues, I will examine some recent attempts to introduce supernatural causes into medicine. I refer here to the numerous studies that have been performed and even reported in the

scientific literature—in distinguished journals such as *The Archives of Internal Medicine*—that claim empirical support for conclusions about the efficacy of prayer (and related activities such as church-going) as a therapeutic modality. These studies deserve our attention because, independently of whether they are flawed or not, they represent serious attempts to gather evidence in favor of supernatural conclusions (attempts that are simply not in evidence in the intelligent design movement, which has contented itself with extensive armchair theorizing).

In chapter 5, I will present some recent and influential biochemical arguments that have been put forward, by Michael Behe and others, to justify the conclusion of intelligent design. Since biochemistry was essentially an unborn fetus in the body of science in Darwin's day, it is certainly possible that these new arguments are not simply old wine in new bottles but represent a substantial challenge to evolutionary biology. The issue here will hinge on the concept of irreducible complexity, a special type of biological complexity that has been alleged to resist an explanation in evolutionary terms. The biochemical design arguments, as well as their broader implications, will be subject to critical scrutiny. In the course of this analysis, it will be shown how irreducible complexity could have evolved, and some relevant evidence will be discussed.

In chapter 6, I will present arguments for the conclusion of intelligent design that proceed from considerations of the nature of the universe and from anthropic principle cosmology in particular. The cosmological design arguments are shown to be inconclusive. Several problems are identified. In some versions of these arguments, there are errors about causation (especially with respect to thermodynamical reasoning). There are also issues about probability theory and failures to consider relevant, alternative, nonsupernatural hypotheses. There is no good evidence to support the claims of intelligent supernatural design. The lessons learned here about the failings of these arguments ought to serve as guides to the critical analysis of future intelligent design arguments, since these will no doubt be forthcoming as gaps get closed and the theorists of supernatural causation are forced to hop to other, currently empty explanatory niches.

In the concluding chapter, I will end the book with some remarks about science, morality, and God. The intelligent design movement has a social agenda that seems to go well beyond science education.

I will discuss this agenda. Design theorists see the issue of origins as being crucial to the formulation of social, political, and legal policies. At the root of these claims is belief in supernatural causation and an objective, transcendent moral order rooted in God.

By contrast, I believe that Darwin himself provides a way of thinking about the functional role of morality that, when developed, accords well with the democratic values that are our common inheritance from the Enlightenment. At rock bottom, this book is about the Enlightenment and its enemies and about the choices we will all have to make, not just about science, but about life itself: how we want to live, how we want society to be structured, how we want to see the future unfold. Ultimately, it is about what we value and how this reflects differing estimates of the nature of the world we live in.