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MONKEY TRIALS AND GORILLA SERMONS

EVOLUTION AND CHRISTIANITY FROM
DARWIN TO INTELLIGENT DESIGN

HARVARD UNIVERSITY PRESS

CAMBRIDGE, MASSACHUSETTS

LONDON, ENGLAND

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C H A P T E R O N E

THE MYTHS OF HISTORY

There is a widespread assumption that science and religion are at war with one another. Which side deserves to win, of course, depends on your point of view. For many traditional religious believers, science is the agent of Godless materialism hell-bent (literally) on destroying humanity's faith in its Creator. For the humanist or atheist, science is a weapon in the fight to replace ancient superstitions with a rational analysis of our place in the universe. The trial of Galileo by the Inquisition of the Roman Catholic Church is often seen as the opening battle in this war, especially by the humanists, who point out that here even the Church eventually had to agree that its attempt to protect the traditional worldview was misguided. The earth really does go around the sun, whatever may be implied by passages in the Bible (e.g., Joshua 10:13). But the clash of ideas and ideologies centered on the theory of evolution is still underway. Here, many still believe, traditional Christianity must make a stand. The churches opposed Darwin when he published the *Origin of Species* in 1859, and that opposition has shown no sign of relenting. In challenging Darwin, the British politician Benjamin Disraeli asked: "Is man an ape or an angel?" and famously replied that he was on the side of the angels (Monypenny and Buckle, 1929: 108). There are many who would still agree that

we were created by God as described in the book of Genesis, not evolved from an ape by a process of natural selection.

Disraeli's quip is only one of the many skirmishes recorded in the battle over evolutionism. Even more famous is the clash between "Darwin's bulldog," Thomas Henry Huxley, and Bishop Samuel Wilberforce at the Oxford meeting of the British Association for the Advancement of Science in 1860. As the Darwinists remember it, Huxley demolished the bishop and cleared the way for Darwin to obtain a fair hearing. But his efforts came to naught sixty-five years later in the so-called "Monkey Trial" of John Thomas Scopes in Dayton, Tennessee. The result of that trial demonstrated that advocates of traditional religion were determined to protect the youth of America from the evolutionists' brand of materialism. Scoff as they might, liberals have been unable to hold back the tide of what soon became known as "creationist" opposition to Darwinism. And in some respects the opposition is quite justified, for modern atheistic Darwinists such as the biologist Richard Dawkins and the philosopher Daniel Dennett present the theory of natural selection as the final nail in the coffin of religious belief. They posit that if we are the products of blindly operating natural laws, any hope of seeing ourselves as the intended products of the Creator's will is out of the question.

In America, at least, the initiative seems to remain in the hands of the creationists. For several decades now, the Religious Right has maintained a constant opposition to the teaching of Darwinian evolutionism in the public schools. The young-earth version of creation science and more recently the idea of Intelligent Design (ID) are promoted as alternatives that must be taught to students. While I was writing this book, the Kansas State Board of Education debated whether or not alternatives to evolutionism should be included in the curriculum. In Kansas, the creationists are inspired by the Rev. Jerry Johnston of the First Family Church in Overland Park, who declared this an opportunity to reverse the

country's moral decline. There was a similar, much publicized confrontation in 2005 in Dover, Pennsylvania, in which the creationists' claims were rejected by the courts. Scientists see the imposition of ID teaching as a recipe for undermining the quality of science education, thereby threatening jobs and economic security. More seriously, the journal *Science* published an editorial in April, 2005 warning that the latest attack on evolutionism might herald "twilight for the Enlightenment"—the final elimination of liberal thought from American life.

This image of confrontation between evolutionism and religion is so pervasive that to challenge it might seem quixotic. But the purpose of this book is to show that such a rigidly polarized model of the relationship benefits only those who want us to believe that no compromise is possible. I do not make this point because I subscribe to the compromise position myself—I am a pretty hard-line skeptic on religious matters. But like Michael Ruse, I disagree with Dawkins and Dennett over the tactics to be adopted when confronted with the kind of situation that exists in America, or in any other country where fundamentalist religion tries to impose rigid limits on what scientists can investigate. Ruse is a philosopher of science who has played a major role himself in the controversies of the last several decades, defending evolutionism against the creationists' attacks. Yet in March 2005, he was reported as having disagreed openly with Dennett, who is perhaps the most aggressive Darwinist in modern America. Ruse argues that polarizing the situation further by stressing the most atheistic interpretation of Darwinism may put the whole enterprise of science and enlightenment at risk by inflaming the opposition. It may be better to oppose the fundamentalists by showing that they have oversimplified the response of religion to the quest for a science of origins. As a historian who has spent decades studying the response to Darwin, and as an observer of modern debates in America and Europe, I too believe that the best defense of evolutionism is to show the complex-

ity of the religious approach to science. There are many scientists who still have deeply held religious beliefs, and many religious thinkers who are happy to accept evolution. Evolutionism is not necessarily atheistic, and creationism is not the only alternative open to the Christian.

To understand how this can be so, we shall make a survey of the history of the engagement of religious faith with scientific evolutionism, showing how a whole range of alternative positions have been explored, establishing a continuous spectrum of opinion where creationists and extreme Darwinists want us to see only black and white alternatives. Here a critical approach to history helps us to understand—if not resolve—the tensions that still divide the modern world.

THE USE AND MISUSE OF THE PAST

The debates sparked by Huxley and later by Scopes offer historical evidence that throws light on the cultural and social origins of the modern issues. But each of these episodes has become enmeshed in a web of interpretation that allows them to function as iconic images, exploited by those who have an interest in encouraging us to see the relationship between evolutionism and religion as polarized between two hostile camps. It is the Darwinists who have led the running in this effort to turn historical episodes into myths that help to shape our modern imagination. As the historian James R. Moore (1979) has shown, the metaphor of a war between science and religion was actually created by Huxley and his followers as part of their campaign to erect science as the new source of influence in modern society. Huxley's American disciple J. W. Draper encapsulated this interpretation of the relationship in his 1875 *History of the Conflict between Religion and Science*. The image of Huxley triumphing at the 1860 BAAS meeting is part of this mythology, designed to encourage the view that science reflects the

freedom of the human intellect to challenge religious dogma. And the popular image of the Scopes trial reflected in the movie *Inherit the Wind* is part of the same ideology. Creationism is portrayed as a blind dogma incapable of standing up to the scrutiny of rational argument. These images are the stock in trade of the rationalists' argument against organized religion, in which the battle over evolutionism is merely an episode in a much wider campaign.

Modern historians have exposed the ways in which popular images of these events have been manipulated to create the myths that sustain the image of a war between science and religion. When eyewitness accounts written by those who were at the 1860 BAAS meeting are checked, there is little to support the view that Huxley forced Wilberforce to slink off in disgrace. Many of the biologists who endorsed the theory of evolution—including Huxley himself—did not accept Darwin's mechanism of natural selection as an explanation of how the process worked. Nor were late-nineteenth-century religious thinkers uniformly opposed to Darwin. Even in early-twentieth-century America, a careful survey of the tracts written by the fundamentalists shows that some of them were willing to accept a form of evolutionism. Several of the southern states refused to follow Tennessee in enacting legislation against teaching evolution in the schools.

These reinterpretations of key events in the story are part of a more general strategy in which historians have reassessed both the so-called Darwinian revolution and the overall relationship between science and religion. Darwin's strongly materialistic theory of natural selection did not begin to dominate biology until the early decades of the twentieth century. Rival theories presented evolution as a goal-directed system of progress, thereby evading the most dangerous implications of Darwinism. Perhaps the process of evolution has a divine purpose built into it. In recognizing this possibility we are led to a more general reassessment of the so-called "war" between science and religion. Through most of its history,

science has been undertaken by people who thought that by studying nature they were helping us to understand its Creator. It turns out that this is true for many of the biologists who have developed the modern theory of evolution.

Equally significant is the support for this less materialistic view of evolution expressed by a wide variety of religious thinkers. James Moore's book has helped to transform our view of the theological debates over Darwinism by bringing to light the significant role played by liberal religious thinkers hoping to bring the Christian faith into line with modern attitudes and knowledge. It has to be said, though, that historians have been less adventurous in seeking to uncover the complexity of the debate over evolutionism in the early twentieth century. Here most historians' attention seems to focus on the rise of fundamentalist opposition to Darwinism and the events leading to the Scopes trial. Even those American historians who have transformed our understanding of the complex events and attitudes surrounding the trial have written little on the efforts of liberal Christians to create a synthesis with non-materialistic views of evolution.

Once we look beyond the evangelical religious movements that led the assault on evolutionism in twentieth-century America, we discover a very different world. American Christians of today may be amazed to find out that some of their compatriots of a hundred years ago welcomed evolutionism with open arms. Nor were the liberals blind to the effect this would have on the basic tenets of Christian faith. The idea of Original Sin was replaced by a faith in the perfectibility of humankind under God's evolutionary plan. In Europe, this liberal vision of Christianity did not even face the rise of fundamentalist opposition to evolutionism that traumatized America in the 1920s. Liberal religious thinkers were convinced that they could make common cause with a science that had turned its back on materialism. At a time when some American states were passing laws forbidding the teaching of evolution altogether, the

Anglican clergyman and future bishop of Birmingham, Ernest William Barnes, hit the headlines by preaching what the London press called his “gorilla sermons” in Westminster Abbey. Barnes was trying to complete the synthesis of evolutionism and liberal theology begun half a century earlier. In so doing, however, he exposed cracks that had only been papered over in the earlier negotiations. If Christians accepted that humanity was the product of evolution—even assuming the process could be seen as the expression of the Creator’s will—then the whole idea of Original Sin would have to be reinterpreted. Far from falling from an original state of grace in the Garden of Eden, we had risen gradually from our animal origins. And if there was no Sin from which we needed salvation, what was the purpose of Christ’s agony on the cross? Christ became merely the perfect man who showed us what we could all hope to become when evolution finished its upward course. Small wonder that many conservative Christians—and not just the American fundamentalists—argued that such a transformation had destroyed the very foundations of their faith. Barnes had put his finger on a problem that still fuels the arguments of conservative Christians against evolutionism to this day.

Yet in America too the liberal view of Christianity was defended against the attacks of the fundamentalists. Famous preachers such as Harry Emerson Fosdick struggled to promote the flexible attitude to the biblical texts that had been developed in the previous century. This approach repudiated the idea of an inerrant text that had to be taken literally even on scientific matters and saw the Bible instead as a historical record of humanity’s interaction with the divine. Significantly, though, Fosdick evaded the scientific debates on the cause of evolution and presented it as the unfolding of a divine plan toward its intended goal. Even this concession would not satisfy those who saw the Christian message as one of salvation for a sinful humanity, a vision that could never be reconciled with the ideology of progress. But scientists and liberal theologians contin-

ued to push the case for compromise, in effect following in the footsteps of Barnes and Fosdick. Historians are now beginning to explore the role played by liberal theology in the evolution debates of twentieth-century America.

At first sight one might have expected the modern opponents of Darwinism to welcome these historical initiatives. In fact, they show little interest in efforts to undermine the warfare metaphor, and seem indifferent to historians' efforts to create a more balanced view of the Darwinian revolution. They have a vested interest in maintaining the popular assumption that evolutionism can only be understood as a manifestation of atheistic materialism. Just like the atheists themselves, the evangelicals who endorse creationism want us to believe that hard-line Darwinism is the only form of evolutionary theory. If the materialistic Darwinians are the only true evolutionists, then evolutionism must be stopped if religious faith is to be preserved. But it is precisely this polarized image of evolutionism that has been undermined by historians' reinterpretation of the Darwinian revolution.

If Dawkins and Dennett can be seen as the intellectual heirs of Thomas Henry Huxley, the line that joins them has to be seen as only one strand in the complex web of interactions on the issue. But the atheists might argue that from the scientific perspective it is the most important position, because it is the only one compatible with modern biology. The combination of Darwinism and genetics has eliminated the non-Darwinian ideas of evolution that sustained the earlier hopes of a dialogue with religion. We can see this in the very different reactions of scientists and religious thinkers to one of the most charismatic mid-twentieth-century writers on this topic. Pierre Teilhard de Chardin was a paleontologist and a Catholic priest who achieved posthumous fame when his *Phenomenon of Man* was translated in 1959. The wave of enthusiasm for Teilhard's vision of humanity as the goal of the Creator's purposeful evolutionary process showed that the liberal tradition was still active. Yet

by this time most scientists were suspicious. Teilhard offered only vague platitudes about how evolution worked, and this cut little ice with biologists who now saw the natural selection of genetic mutations as the only plausible mechanism. In this sense, the radical Darwinians are right to reject the liberal synthesis as a dead duck, because its scientific foundation is no longer plausible.

But the situation is not quite so simple. Ideas and attitudes are still developing, and liberal Christian thinkers are exploring ways of rendering the theories of Darwinian selection compatible with their faith. Bishop Barnes was in touch with the new Darwinism that was just beginning to emerge in the 1920s and 1930s—he knew Ronald Aylmer Fisher, one of the architects of the modern theory of natural selection who was himself a liberal Christian. Modern theologians who know their science—writers such as Arthur Peacocke and John Polkinghorne—seek a dialogue with biology in the full knowledge that it must include the Darwinian view of evolution. They explore ways in which natural selection can be seen as part of the Creator's purpose, even though it reveals that evolution has no central driving force aimed at a predetermined goal. If Dawkins and Dennett are T. H. Huxley's intellectual heirs, these thinkers are the heirs of Barnes and the earlier generations of liberal Christians who sought to accommodate the latest developments in science.

The liberal tradition in twentieth-century theology appears most visibly in European sources. This may be partly an artifact of historical analysis—as noted above, historians of American culture have tended to focus on the evangelicals' opposition to evolutionism. But this in itself reflects the interests of American culture in the late twentieth and early twenty-first centuries. Europe has only recently been exposed to the kind of evangelical opposition to evolutionism that has been characteristic of American religion since the 1920s. Europe is now a largely secular culture in which the most active form of religion is fundamentalism (both

Christian and Islamic) imported from abroad. The issues discussed in this book thus look very different when viewed from a European perspective. (I might add that for the last twenty-five years I have lived in Northern Ireland, one of the few areas in Europe where religion has retained a strong hold on the people, as a source of identity in a dangerously divided society.) But the liberal tradition is not absent from American religion, for all that it does not appear in the media, and a more balanced account of how religious thinkers have responded to Darwinism across the whole period since the *Origin of Species* was published may offer useful food for thought.

ISSUES THAT DIVIDE

Before launching into the reinterpretations sketched in above, it will be constructive to clarify the issues that define the debate. Far more is at stake than a simple confrontation between Darwinism and a literal reading of the book of Genesis. Evolutionism raises general issues about how God might govern the universe, and specific issues about the status of humanity within the universe and the wider scheme of creation. Within these two main categories there are a number of subissues, each of which can divide even religious thinkers who are conscientiously trying to articulate their faith in the face of the evidence offered by modern science.

It's also worth remembering that there are nonreligious traditions that share the creationists' distrust of Darwinism, but for very different reasons. Left-wing thinkers see the theory of natural selection as a means for articulating harsh policies of "social Darwinism" with an apparently scientific justification. But some of the values they identify with Darwinism are those shared by many Americans on the Religious Right. Such apparent paradoxes warn us that any attempt to understand the relationships between humanity and the natural world leads us into a minefield of rival

value systems, all of which seek to justify themselves by discrediting their opponents' use of science.

There have been efforts to show that the whole debate is unnecessary and arises from a fundamental misunderstanding of the natures of science and religion. The noted paleontologist and science writer Stephen Jay Gould argued this in his *Rocks of Ages* (1999). His point was that science is concerned with facts, whereas religion deals with human values. There is no contact between the two enterprises because they are asking different kinds of questions. They are, in Gould's term, "non-overlapping magisteria," equally important but quite independent from one another. But to make this case Gould had to treat religions as nothing but ethical systems, and although it is true that all religions do endorse ethical values, they are much more than value systems. They seek to define the origin and nature of both humankind and the cosmos, and in most cases those definitions are derived from creation stories contained in sacred texts. To separate the creation myths from the value systems they support is to misunderstand the nature of religion, and here Gould's effort to cut the Gordian knot fails. Christians defend their values by defending a vision of how God created the universe, and that is why they cannot regard science as irrelevant. The question is: how rigidly does the belief system of a religion such as Christianity define the framework within which scientists can investigate the world?

To see why theologians and philosophers can fall out over how to deal with evolutionism, we must note that some of the issues are very general, in the sense that they would arise even for someone whose religious faith was not derived from a body of sacred literature. The philosophy known as deism postulates a God who designed the universe but took no further interest in it once He had created it. A deist has no interest in the creation story of the Bible (or of any other allegedly sacred text), but might still want to de-

fend the idea that the universe shows some signs of being created by an intelligent Being. Such a philosophy is too impersonal for most religious believers: most traditional faiths are forms of theism, that is, they support the belief that God not only created the universe but also continues to take an interest in it. He may even interfere with its normal operations from time to time, such supernatural interventions being what we normally call miracles. One can be a theist in a general sense without accepting any of the existing theological traditions (or by combining elements from several of them, as in the Baha'i faith).

Turning to the traditional faiths, we shall be concerned almost exclusively with the various forms of Christianity, although the other great religions of the world have also taken positions on the issues raised by evolutionism. Some can be fairly relaxed about ideas that are deeply worrying for the great monotheistic faiths. Hinduism, for instance, has sacred texts which imply that the universe goes through great cycles of change over vast periods of time. It also refuses to make the clear distinction between humans and animals that seems so obvious to those religions that draw their origins in part from the Hebrew tradition.

There are three major monotheistic faiths that take what the Christians call the Old Testament seriously as divine revelation (this comprises the Jewish sacred texts, including the Torah, the first five books of the Old Testament supposed to have been written by Moses). Christianity adds to this the New Testament, which presents Jesus as the savior who will redeem us from the blight of Original Sin (Adam and Eve's disobedience that led to the expulsion of the human race from paradise). The Islamic faith accepts Jesus as a great prophet, but focuses its attention instead on the Koran, the revelation of the prophet Mohammed. Judaism and Christianity focus on the story of creation as described in the book of Genesis when they confront the alternative story of the earth's history told by modern geology and evolution theory. When taken lit-

erally, the story in Genesis implies that God made a single creation that included humans almost from the very beginning, and that creation has not changed since (except perhaps for the catastrophic events of Noah's flood). Humans are distinct from animals because only they were created with souls that will be judged by their Creator in some form of afterlife. One of the great problems evolutionism poses for this version of events is that it implies that we are derived by a gradual process from the animals, thereby casting doubts on the unique status of the soul.

The rest of this chapter provides only a skeleton outline of the relevant positions. Further details and guides to further reading are provided in the appropriate later chapters of this book. For general reading on the relationship between science and religion, see the classic texts by Ian G. Barbour (1966, 1968). Surveys of the history of the interaction between science and religion include Brooke, 1991; Ferngren, ed., 2002, and Lindberg and Numbers, eds., 1986, 2003. For more detailed surveys of the debates over evolution see Appleman, 2001; Durant, ed., 1985; Greene, 1959, and Moore, 1979, and for recent surveys of the issues raised by evolutionism, see Ruse, 2005.

THE SACRED TEXT

We begin with the problems posed by the appeal to a sacred text, in this case the Bible in general and the book of Genesis in particular. For many evangelical Christians, this is the great issue: if the Bible is the word of God, it must be taken seriously when judging any other account of the earth and humanity's origins. The Bible tells us that God formed the heavens and the earth in seven days, according to the first chapter of Genesis, with Adam and Eve being created on the sixth day (the seventh, of course, is the Sabbath). There is no mention of a significant period of prehistory (i.e., history before the appearance of humanity), and certainly no reference to periods

in which the earth was populated by animals different to those we see around us today. The human race has existed since the creation, and the records allow us to date its origin, and hence by implication the creation of the universe itself. In the seventeenth century the archbishop of Armagh, James Ussher, added up the ages of the patriarchs mentioned in the Bible back as far as Adam and concluded that the earth was created in 4004 B.C. (at midday on Sunday, 23rd October, to be precise). The young-earth creationists of today have revived the view that the earth can be only a few thousands of years old.

Such an interpretation of the sacred record obviously rules out evolution, but it also rules out the whole package of modern sciences dealing with earth history, including geology, paleontology, and prehistoric archaeology. As critics of the young-earth position point out, it takes us back to a position that has not been taken seriously by working scientists since the late seventeenth century. The alternative creation science promoted by the young-earth movement revives the once popular idea that all the fossil-bearing rocks were laid down in Noah's flood, the one event mentioned in the Bible that might have completely reshaped the earth's surface. Significantly, the young-earth movement used to feel the need to offer an alternative *science* of the past, arguing that their theory can make better sense of the actual evidence from the rocks. Modern proponents of Intelligent Design also see their rejection of evolutionism as based on scientific arguments, although some creationists deny any authority to the scientific approach, claiming that the scientists are just rival storytellers trying to convince the audience by mere rhetoric.

Why do fundamentalists take the creation story literally? As we shall see, there are plenty of sincere Christians who are prepared to see creation in a metaphorical sense that is compatible with some form of evolutionism. Michael Ruse, himself an active participant in the debates on the side of evolutionism, explains in a recent

study (2005) how the answer to this question lies in a particular vision of Christianity's predictions about the end of the world (which in the Book of Revelation will be preceded by the millennium, the thousand-year rule of Christ). Ruse argues that Christians can be divided into two camps, the postmillenarians, who believe that we can bring about the kingdom of God on this earth before the end, and the premillenarians, who think that nothing can improve this world and we should all be preparing for the coming of an external salvation. The postmillenarians are liberals who can be persuaded to take a more relaxed view on the word of Genesis. The premillenarians are fundamentalists who are forced to take the Bible story of the earth's origin seriously in order to defend their literal interpretation of the predictions about its end. The premillenarians are also opposed to the whole ideology of social progress, which they see as an illusion that distracts us from humanity's essentially sinful nature. Since evolutionism is often used to underpin the idea of progress, here is another reason for opposing a metaphorical reading of Genesis.

The young-earth version of the creation story takes the whole narrative literally, including the six days of creation, which are assumed to be days of twenty-four hours. But not all Christians take the word of God literally, at least in areas where it refers to matters of scientific fact. When defending his right to investigate Copernicus' theory that the earth goes around the sun, Galileo argued that the sacred record is not an astronomy textbook. Its purpose is to convey the Christian message of salvation to ordinary people, and it necessarily had to be expressed in language consistent with a common-sense worldview. It was written as though the earth were the center of the universe, because to raise the issues addressed by Copernicus would only confuse people over technicalities to no purpose, as far as the spiritual message was concerned. The sacred text was recorded by writers who—even though divinely inspired—could only relate events that were comprehensible to them and to

their hearers at the time. To imagine that God's ability to create a universe was constrained by the level of scientific understanding achieved by the ancient Hebrews is to make a mockery of any notion of divine omnipotence. Note how Galileo's assumption takes for granted the idea of progress in human understanding of nature, paving the way for what Ruse calls the postmillenarianism of liberal Christianity. In the following century, the call to reinterpret the Bible on an increasingly wide range of issues generated the ideology of social progress that would challenge the structure of traditional Christianity—although this was the last thing Galileo intended.

The geological sciences soon provided evidence that the structure of the earth's crust is too complex to be explained as the product of Noah's flood. The evidence implied that there were extensive periods before humans appeared. As long as one accepted that the universe was divinely created in the beginning, then the actual wording of Genesis might not have to be taken literally on the details of how the earth was formed. Theological liberals argue that the Bible tells us about our origin as God's creatures, but it is not a geology textbook. There is no mention of dinosaurs and vast geological periods, because this would have confused the ordinary people who needed to be convinced of the moral heart of the story.

There are two ways of treating the text in an allegorical fashion. Perhaps the days of creation are metaphors for vast periods of geological time, each day representing a whole epoch such as the age of dinosaurs. It could be argued that there is some correspondence between the sequence of animal and plant creations mentioned in Genesis and that provided by the fossil record. Alternatively, the Genesis story seems to imply a gap between the initial act of creation of the universe and the more detailed story located in the Garden of Eden. Perhaps this gap included a vast period of time during which there were other creations not actually mentioned in the text.

If either of these interpretations is accepted, much of modern

geology and paleontology can be accommodated. There would be a series of creations before the appearance of humankind. Perhaps Noah's flood was the last of many such catastrophes, each responsible for the extinction of whole populations. Some modern creationists accept this position and are even prepared to allow for a limited form of evolution in each period (including the early phase of the present world), as long as the ancestral form of each main type of living thing is presumed to be divinely created. The full evolutionary perspective rejects this compromise. Basing itself on a more general presumption that miracles do not occur in the world, it postulates that natural laws must be able to explain all of the developments revealed by the fossil record, up to and including the origin of humanity. Thus each new species has to be the modified descendant of an ancestral form, and humans must have evolved from an ape-like creature (since the apes are our closest biological relatives). This position does not necessarily rule out acceptance of miracles in the course of human history—it can be argued that although God does not normally interfere with His creation, He is willing to do so in order to focus our attention on the events that are crucial for our salvation. But the processes that shaped the development of the earth and its inhabitants should not be understood to include any supernatural interference. Without this presumption, the evolutionist argues, science cannot study these processes. Its methods cannot tackle the supernatural, and there would be no way of being sure where the realm of natural law ended and that of miracle began.

THE ARGUMENT FROM DESIGN

Once the decision has been made to adopt this evolutionary perspective, there are two main areas of concern for any religious thinker operating within the Judeo-Christian framework. The first is the question of design: if species are created by miracle, we know

that they have been designed by a wise and benevolent Creator. Can we still believe that God has a hand in the creation of species if they have been formed by processes governed by natural law? This is not necessarily impossible if the laws themselves were instituted by God and govern a system that He intended to produce certain results. The second issue relates to the human soul. If—as the Judeo-Christian religions believe—humans are distinct from the other animals by virtue of possessing a spiritual element in their character, how is it possible for a species whose members possess such a unique character to have evolved gradually from one that does not? Evolution makes no room for a discontinuity: either the animals must have at least some primitive level of spirituality that could be enhanced, or the whole notion of the soul is a delusion.

Turning first to the question of design, the exponents of what is called “natural theology” suppose that in studying nature one is studying the handiwork of God and can expect to see evidence of His intelligence imprinted on what we see. The classic way of formulating the “argument from design” in the area of natural history is to demonstrate the complexity of the living body and the adaptations of its various functions to the necessities of life, and to insist that such a well-designed system cannot have originated by chance—it must be the direct product of the Creator’s will. In William Paley’s classic text *Natural Theology* of 1802 we find the analogy of the watch and the watchmaker. If we find a watch when walking through the countryside, argues Paley, we know that such a complex structure of springs, cogwheels, etc. cannot had been produced by the undirected forces of nature, and we presume that it is an artificial construct made by an intelligent person, the watchmaker. (I have never been sure whether or not this analogy still works with modern watches, which are just electronic “black boxes” as far as most of us are concerned.) By the same token, if we study the human or animal body and similarly find a complex series of

structures all adapted to the end of keeping the body alive, we are entitled to suppose that undirected nature could not have formed it, and so here too there must be an intelligent designer, God.

Darwinists claim that natural selection can produce complex structures without the involvement of design, in effect by trial and error. New structures are built up by a process of tinkering, in which each slight improvement is preserved. In response to this challenge, modern creationists invoke Intelligent Design (ID) to preserve the essence of Paley's argument. The supporters of ID take the study of the living body onto new levels, investigating even the biochemical processes that keep the various functions operating. They claim to find evidence of complexity that rules out the possibility of intermediate stages by which evolution could have built up the structures. All parts of the system must function together, or it doesn't work at all. The only possible explanation involves some form of supernatural intelligence to design the whole system in a coordinated way. The Darwinists challenge the individual examples but also complain that to invoke the supernatural is to erect a barrier against any further scientific exploration of the topic.

History also poses a problem here, because there have been many religious biologists who were not impressed by this version of design. Paley focused on the usefulness of the structures possessed by particular species. Each animal has its own special features adapting it to its way of life. But to some biologists this seemed a rather crude notion of design, since it presented God as a kind of engineer, building a vast collection of individual structures according to no principle other than that of local expediency. They looked for patterns in the overall collection of living things, noting that underneath the individual adaptations there were relationships between species. The existence of these relationships hinted that the whole of creation formed a unified, harmonious design. Darwin's great opponent Richard Owen argued that all the vertebrates were

superficial modifications of a single pattern, evidence that God designed them as a rationally ordered whole, not just a ragtag and bobtail of individual adaptations.

The problem with this argument is that once you start to see patterns linking species, it becomes much more plausible to imagine all the variations unfolding by a continuous process. Although widely dismissed as an opponent of Darwinism, Owen himself in the end came to adopt the idea of “theistic evolutionism.” He believed that the emergence of individual species came about by the unfolding of a universal plan under the operation of natural laws that were expressions of the divine will. Here is the most obvious compromise between the idea of design and the theory of evolution. Evolution occurs, but it is not a totally natural process because the course of development, and the ultimate goal, is determined by God’s designing intelligence operating within the laws of nature.

The problem with theistic evolutionism, as far as many scientists are concerned, is that we do not normally think of the laws of nature as entities capable of seeing and planning for the future. The law of gravity operates just the same whether you are sitting on an armchair or falling off a cliff—if it somehow modified itself to prevent a tragedy in the latter circumstance, it wouldn’t be a real law. Theistic evolutionism was trying to incorporate the supernatural into the natural, leading the philosopher John Dewey to scoff at it as “design on the installment plan.”

Biologists looked for a mechanism of evolution that would be lawlike in the manner normally accepted by scientists, but which would still allow them to believe that the universe was not a process of trial and error as Darwin had supposed. The most promising approach was known as “Lamarckism,” after the French biologist Jean Baptiste Lamarck. Lamarckism works through a process in which animals improve themselves by their own efforts (see Chapter 2 for details). Lamarckism requires no struggle for existence and allows evolution to be led in a purposeful direction by the animals’ recog-

inition of what is good for them. This sounds like the kind of process that a wise and benevolent God would institute as a means of allowing His creatures to flourish in the world. Yet it works by what appears to be a combination of perfectly natural processes.

The only problem with Lamarckism was that by the early twentieth century, the science of heredity had shown that characters acquired through an animal's efforts cannot be inherited. The genes pass on characters in a predetermined manner and cannot be affected by changes in the organism that carries them. The only alternative mechanism of adaptive change is Darwinian natural selection, which can fairly easily be adapted to the genetic model of heredity. And here we see the central importance of Darwin's theory in this debate, because natural selection does not look at all like the kind of mechanism a wise and benevolent God would institute to bring about adaptive evolution.

There are two reasons for this. The first is that the raw material of selection is the minute variations that allow each organism (like each human being) to be recognized as an individual. These variations are sometimes said to be random, not because they are uncaused, but because whatever causes them seems to have no regard to what would be beneficial to the individual or to the species. People have all sorts of different hair colors, and it doesn't seem to make any difference to their lives. In modern genetics, this variation is seen as the result of genetic differences. Ultimately this range of genetic variation is caused by mutation, a form of copying error in which a gene that used to code for a particular character is changed so that it produces something different. And precisely because these are copying *errors*, they do not appear according to the needs of the individual, and many of them are positively harmful. The raw material of natural selection has no built-in design, no way of anticipating the future needs of the species: it is a process of trial and error. The God who chose to create a universe in which evolution worked in this way was certainly not taking a hands-on approach.

The reason why a chaos of original variation can produce characters that look as though they have been designed is the process of selection. In any new environment, genes that code for what has now become a useful character will increase their frequency in the population, because the organisms which carry them will breed more readily. Those with maladaptive genes will not do very well in what Darwin called the “struggle for existence” and will not breed—they may well die. The proportion of genes conferring adaptive benefits thus increases and the species evolves toward an appropriate specialized character.

Here is the second reason why theologians have found it hard to accept Darwinism as a mechanism instituted by God—the whole process is driven by death and suffering. To be fair, this isn’t a problem for the theory of natural selection alone. Darwin and his followers have provided enough evidence to show that there must be a massive elimination of individuals within every population just to keep the numbers stable. The basis for what Darwin called the “struggle for existence” is built into nature—whether or not it serves as the driving force of evolution. Many Christians find the notion of a world governed by struggle and suffering as abhorrent, although some biblical literalists see it as a consequence of Original Sin. On this model there was no struggle before the Fall, and the literalists are disturbed by paleontologists’ claim that the fossil record shows the prevalence of death and predation in the animal kingdom long before humans appeared.

Liberal theologians accept a role for struggle and suffering, seeing it as a creative agent, a process that encourages us all to better ourselves. This is hardly a valid model for the Darwinian theory, but in the latest versions of liberal theology a more realistic effort is being made to accommodate the harsher side of nature. Theologians point out that Christianity is unique among religions in seeing suffering as an integral part of the relationship between the human and the divine. Suffering and conflict are inevitable in a

world blighted by sin, and Christ's suffering on the cross—the price of salvation—allows the divinity to participate in this aspect of the world's operations. Perhaps, then, it should not surprise us to find that suffering is in fact part of the creative process by which we were formed. Paradoxically, Christianity may be in a better position to deal with an evolution theory based on the struggle for existence than other religions, which take a less pessimistic view of the human situation.

HUMAN ORIGINS

The question of human sinfulness points us toward the other major area of concern for religious thinkers confronting the challenge of evolutionism. Whatever the mechanism of change, evolution presupposes that humans have evolved from animals, with the chimpanzee as our closest relative. This should not be a problem for a religion such as Hinduism, which accepts the possibility that souls now inhabiting human bodies may be reincarnated in animals in some future life. But Christianity belongs to a group of religions which base their beliefs on texts stating that humans were created with intellectual, moral, and spiritual powers transcending the mentality of animals. For Christians, then, the idea that humans with immortal souls have emerged by a gradual process from the “brutes that perish” is deeply disturbing. How can a natural process have produced these higher levels of existence from so unpromising a raw material? Isn't it obvious that the soul must have been specially created, appearing only in the first humans? And in this case, doesn't it make more sense to believe that the first humans—Adam and Eve, if Genesis is taken literally—were created body and soul by a miraculous act of God?

The problem is compounded by Darwinism's focus on the survival of the fittest as the mechanism of change. If species only change when populations adapt to new conditions, there is no ne-

cessity for evolution to be progressive and no possibility of seeing humans as the goal of a predetermined plan. The old idea of a ladder of creation with humans at the top allowed the religious believer to interpret evolution as the unfolding of a divine plan that had humanity as its ultimate goal. Darwinism turns the ladder into an ever-branching tree in which no one branch can be privileged as the main trunk, no final twig as the goal of creation. And if natural selection is the process of change, the motor of evolution has no purpose—it is a totally amoral sorting of the best-adapted individuals generated by random genetic mutation. How could such a mechanism produce the moral and spiritual characters that some Christians believe raise us above the animals?

Darwin himself tried to make the case for the *Descent of Man* (the title of his 1871 book on the topic) by minimizing the gap between the higher animals and the “lowest” humans. By modern evaluations, he exaggerated the mental powers of animals by accepting anecdotal evidence of their intelligence and even their moral awareness. He also depicted some living races of humanity as closer to the ancestral ape, in a manner we would find quite unacceptable today. Modern scientists are well aware that however small the genetic difference between humans and chimpanzees, humans do indeed have mental faculties that are significantly more advanced than those of even our closest relatives.

Perhaps the greatest point of controversy centers on our moral sense or conscience. Darwin tried to explain this in terms of our social instincts, implanted by evolution in any species in which the individuals live in cooperating groups. The more militant of the modern Darwinians are only too happy to rise to this challenge by insisting that the Christian view of the human situation is fundamentally unrealistic. We are, they insist, only improved animals, still driven by animal desires despite our increased intelligence. Modern evolutionary psychology is seeking ways of explaining how the various faculties of the mind have evolved in the circumstances

to which our immediately prehuman ancestors were exposed. The science of sociobiology explains all animal behavior, including human social behavior, in terms of instincts generated by natural selection acting among groups of genetically related individuals. Morality is just another product of what Dawkins calls the “selfish gene.”

Modern creationists often accuse Darwinism of encouraging us to behave brutally to one another. After all, the theory does tell us that we are no better than brutes, so we should not be surprised if it is used to argue that our behavior is programmed to include brutal instincts. They talk darkly of the horrors of social Darwinism, and point to Nazi Germany to illustrate what happens when political leaders glorify the struggle for existence. But the creationists are usually silent on the ideological origins of Darwin’s theory, which historians link to the free-enterprise culture of Victorian Britain. The political Left dislikes social Darwinism too—but its preferred example of unrestrained struggle is the competitive individualism of the capitalist system. By this standard, it is the free-enterprise ideology favored by most American creationists that counts as social Darwinism!

This issue warns us of the need to be very careful in assessing the alleged implications of the claim that humans are governed by biological instincts. There have been many different forms of social Darwinism, depending on whether the struggle for existence was seen as operating between individuals or groups (e.g., nations or races). Hitler certainly pointed to Darwinism as one source of his vision of nations locked into a struggle for supremacy, but many opponents of free-enterprise capitalism have seen that political system as the more natural analog of Darwinian biology. To many Americans, the free-enterprise system seems the guarantee of freedom and economic progress, but they would do well to recognize that when Darwinism first appeared, it was precisely the hope of this form of progress that encouraged many to support it.

To creationists the analogy between free-enterprise capitalism and the Darwinian struggle for existence seems absurd. The whole point of their rejection of evolutionism is to defend the claim that the human spirit is something lifted above the level of brute nature. Self-reliance and the drive for personal success should always be tempered by Christian values, which can have no basis in animal behavior. This brings us back to the central problem posed by Darwinism, its implication that human nature is simply an improved version of the mentality of animals. How can the higher moral values emerge from a brutal struggle for existence? The simple answer for creationists is that they cannot, and hence we need to see humans as the products of supernatural creation, not of natural processes. But the analogy noted above between Darwinian struggle and free-enterprise individualism reminds us that it is not always easy to define what is part of nature and what rises above it. Conservative religious thinkers have always tended to take the hard-line position against evolution. But liberal thinkers have tried to find a way of accepting that we may be the product of nature, while portraying nature as something capable of lifting its products steadily up toward higher things.

History shows us that there are many ways of trying to soften the impact of evolutionism on the Christian view of human origins, although they usually involve modifying the central tenets of Darwinism. One obvious tactic, still the official position of the Roman Catholic Church, is to accept the evolution of the human body from some lower form but insist that the soul was an entirely new entity created and miraculously implanted in the first true humans. Most Darwinists see this as pointless: why go to all the trouble of formulating a comprehensive theory of evolution only to concede that it does not apply to the most interesting and original development in the history of life on earth? A more promising approach is the idea of emergent evolution. This assumes that evolution is continuous at one level, but occasionally reaches thresholds or break-

through points where something entirely new enters into the world. The appearance of the human mind would be one such breakthrough. The Darwinist, however, still looks for the causal mechanisms that create the new faculties, and tends to find the notion of emergence a meaningless concession to outdated religious preconceptions.

Another approach is to focus on the whole pattern of evolution, in the hope of seeing evidence that the human mind is the intended product of a process instituted by the Creator. In the nineteenth century it was widely assumed that evolution was inevitably progressive. The tree of life was routinely depicted with a central trunk that ran up toward humankind as the goal of creation. This was why the social Darwinists assumed that the struggle for existence was the motor of both biological and social progress. Liberal religious thinkers also took comfort in the idea of progress, seeing it as evidence that the whole evolutionary process represented a divine plan driven by mechanisms that were inherently purposeful. To them, it did not seem quite so unreasonable to imagine that even the higher human faculties were produced by such a process. The modern Darwinian perspective (seldom fully appreciated by Darwin's immediate followers) makes this assumption more difficult to sustain, because there is no goal toward which evolution is moving, and the mechanism of change is anything but purposeful. One of the greatest challenges for those present-day theologians who wish to engage with Darwinism is that presented by evolutionary psychology's efforts to explain human behavior as driven by mechanistic processes in the brain, established by natural selection.

For the theologians to deal with this issue, they have to confront the problems identified in Barnes's gorilla sermons. The problem with linking evolution to the idea of progress is that by turning humans into the goal of evolution, we imply that human history is only a continuation of the advance that has taken place through the animal kingdom. But Christians have traditionally assumed that

history is not progressive: humans have fallen from an original state of grace through Original Sin, and can only gain salvation through Christ's sacrifice on the cross. To argue—as Barnes and his modern successors must do—that we have risen from the apes as part of God's plan is to miss the point of Christianity's belief that we are contaminated by sin, that the divine purpose has been frustrated by humanity's willful separation from God after its creation. This is the basis of the premillenarianism of the fundamentalist position identified in Ruse's analysis: Evolution is false not only because it denies that we are created by God, but because it is linked to an ideology of social progress, which claims that we can improve conditions here on earth. Liberal Christians may adopt the postmillenarian position, in which we bring about the kingdom of God through our own efforts before the end of the world, but for the evangelical the only hope for sinful humanity is salvation through the acceptance of Christ.

Here again, though, the Darwinian emphasis on the undirected nature of evolution may turn out to be a hitherto unrecognized advantage. Perhaps the old-fashioned liberals were wrong to emphasize progress in order to see us as products of a rigidly preordained divine plan. If we see evolution as a more experimental process, groping its way upward against all the odds, we can better understand the tensions that lie at the heart of the human situation. We are animals who have acquired higher powers by what the atheist sees as a cosmic accident, but which the Christian might understand as the Creator's only way of producing beings with the freedom and the ability to challenge their biological inheritance. The very fact that Christianity takes such a pessimistic view of the human situation makes it the best-placed of all the major religions to deal with the challenges of Darwinism. For those Christians who can face the prospect of breaking with a literal interpretation of Genesis, the fact that evolution does not seem to be focused on progress and preordained purpose offers a chance to explore the

possibility of a creative synthesis with modern biology. In recognizing that nature is not so obviously designed as the natural theologians imagined, we see that the Christian sense of the imperfection of humanity was not misplaced after all.

A historical study of the encounter between evolutionism and religion may thus pave the way for a better understanding of the tensions so obvious in the modern world. The story has not been one of endless conflict. It has also involved efforts to establish a synthesis that have required both sides to think carefully about underlying principles. The literalist will never compromise, of course, and we need to understand why. But the liberal position has itself evolved over time, and is still evolving today.