

AS FUNDAMENTALIST religious thought strengthens its hold on politics here and around the world, enlightenment values that form the very foundation of modern society increasingly are coming under attack. In the U.S., we call it “culture wars.” Looking beyond the smoke and mirrors, the conflict really is between two fundamentally different and mutually exclusive world views: one based on science, reason, and observation; the other on an interpretation of Scripture that dates back to past periods of religious intolerance. The dispute is over how humanity came into being and whether or not we are imbued with an immortal soul.

Unlike Buddhism and Hinduism, which are not discussed here, Christianity, Judaism, and Islam are religions grounded on revelation. To understand why such a basis conflicts with scientific knowledge, it is necessary to understand exactly what is meant by revelation. Most people who use this term are referring to theophany, the sudden and dramatic manifestation of God or the unveiling of a mystery. Moses seeing the unconsumed burning bush and his speaking with God on Mount Sinai and receiving the Ten Commandments inscribed on stone are examples. This conception defines what is meant by God in the context of this essay. Religious fundamentalists—whether Christian, Jewish, or Islamic—believe in theophany, and theophany, as recorded in Scripture, gives an absolute, eternal form of truth. Nothing that comes after can alter such truths. It is for this reason that fundamentalists believe in, and are bound to, a literal interpretation of Scripture.

As theophany, revelation is the exact antithesis of scientific knowledge. People often refer to the “laws of nature” established by science, but this is very misleading. All scientific knowledge is provisional, based on observationally constrained models of the world as perceived through our senses and aided by instruments. Secular, scientific reasoning cannot accept the divine, with its immutable truths, if it is to remain true to itself; knowledge gained from scientific reasoning and knowledge gained through revelation fundamentally are incompatible because one is provisional and the other eternal.

There is, however, a form of revelation—not based on theophany—that is compatible with science. As put by the one-time Catholic priest James Carroll in *Constantine's Sword*, “The truth of our beliefs is revealed in history, within the contours of the mundane, and not through cosmic interruptions in the flow of time. Revelation comes to us gradually, according to the methods of human knowing, and so revelation comes to us ambiguously. Certitude and clarity are achieved only in hindsight, and even then provisionally.” Since it is this provisional nature of knowledge that also is the essence of scientific knowledge, religious people who find themselves able to accept Carroll’s definition of revelation should have no difficulty accepting the findings of modern science—those findings reflect the will of God. They could accept the scientific facts that the universe as we know it came into being some 14,000,000,000 years ago, and that human beings have evolved through Darwinian variation and selection along with all other creatures on Earth.

In the U.S., the wedge issue being used by fundamentalists to challenge the scientific world view is a pseudo debate over creationism and Charles Darwin’s theory of the descent of man. The controversy over evolution and creationism—or its recent incarnation as “intelligent design”—has raged since the Darwinian revolution of the 19th century. It really is a continuation of the reaction against the Enlightenment. In the U.S., according to a 2010 Gallup poll, 40% of people believe that God created humans in their present form; 38% believe humans evolved, but with the guiding hand of God; and 16% believe humans evolved with God having no part in the process. There is more: 60% of those who attend church weekly, 52% of Republicans, and 22% of those with college degrees and a post-graduate education believe God created humans in their present form within the last 10,000 years. This time estimate is based on a literal interpretation of biblical chronology, one that is incompatible with Darwin’s slow evolution of species.

The “debate” over creationism, while it often is presented as having opposing sides, actually is one-sided since the scientific debate over evolution ended more than a century ago. Few remember that, soon after the publication of Darwin’s *Origin of Species*, the Scottish engineer Fleeming Jenkin showed that its basic thesis seriously was flawed. Many at the time, including Darwin before he was exposed to Jenkin’s argument, believed in the blending of inherited characteristics.

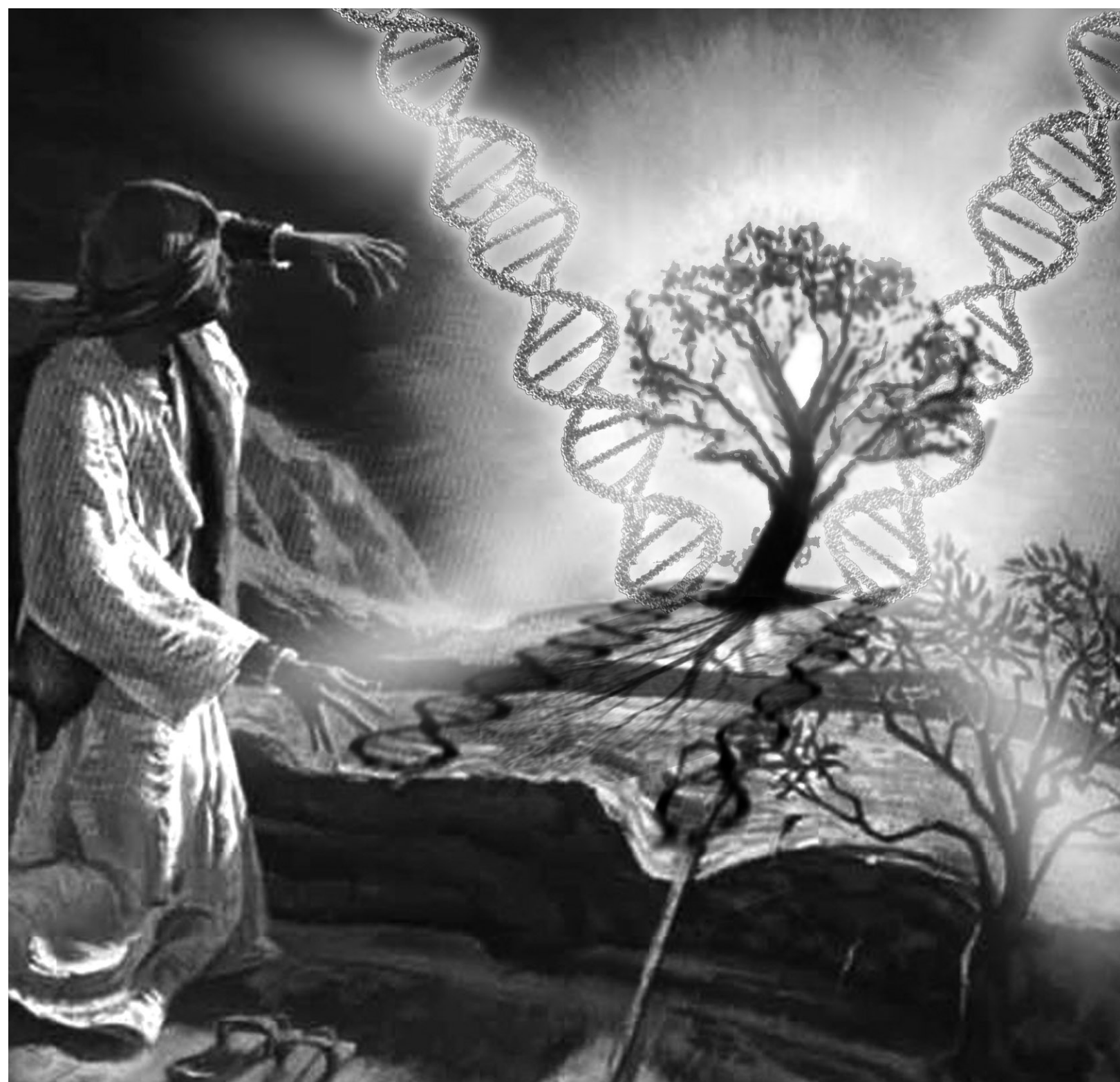
The Challenge to the Enlightenment

BY GERALD E. MARSH

“ . . . The conflict here and abroad really is between two fundamentally different and mutually exclusive world views: one based on science, reason, and observation; the other on an interpretation of Scripture that dates back to past periods of religious intolerance.”

Being unaware of the discrete nature of mutations—as was Darwin himself—Jenkin argued that a newly manifested character possessed by a few individuals would be diluted out of existence rapidly when those possessing the new character mated with the large number of individuals in the normal population. Both Jenkin and Darwin regarded this dilution argument as a barrier to evolution within a single lineage. Without an answer to Jenkin’s criticism, the entire conceptual foundation of Darwin’s Theory of Evolution—that new species arose through variation and selection—would be lost. The debate ended with the rediscovery of the forgotten work by the Central European monk Gregor Mendel showing that mutations resulting in trait alterations had a discrete character that did not blend during reproduction. This fascinating history and a great deal more is contained in *Darwin’s Century* (1958) by Loren Eiseley.

Darwin’s Theory of Evolution, like all other scientific theories, is not static. It, too, has evolved and become what is known as the Modern Syn-



thesis, a term that dates back to Julian Huxley's *Evolution: The Modern Synthesis* (1942). Since then, the discovery of DNA, as well as the symbiotic origin of some components of cells discovered by Lynn Margulis and the role of genetics in developmental biology all have been incorporated into the Synthesis. The basic concept of variation and selection remains robust, but how, for example, creatures are formed—known as ontogeny—has changed dramatically as we learn more about genes and how they function. When and where genes are turned on and off during the formation and development of the individual is crucial. The genetic regulatory process in ontogeny and in adult forms is not yet understood fully, but its general outlines are emerging. Some of the elegance and beauty of this expansion of the theory has been captured in *Evolution in Four Dimensions* (2005) by Eva Jablonka and Marion Lamb.

Biology has moved on, but many people and institutions have not. Those still fighting the 19th-century battle against evolution have yet to

realize that science has moved far beyond their current concerns. An even more fundamental challenge to their world view is at their doorstep. It is one that far transcends past challenges of the Enlightenment: we now are on the verge of creating life—and indeed, essentially already have done so. Craig Venter's laboratory has produced functioning viruses from ordinary laboratory chemicals. The next step—making an artificial chromosome composed of manufactured DNA and transferring it into a cell which had its own nucleus removed—successfully resulted in a bacterium that multiplied as any other living bacterium. This field of research is a branch of what generally is known as synthetic biology. As described by Steven A. Benner and A. Michael Sismour in *Nature*, "Synthetic biologists come in two broad classes. One uses unnatural molecules to reproduce emergent behaviours from natural biology, with the goal of creating artificial life. The other seeks interchangeable parts from natural biology to assemble into systems that function unnaturally."

It is not too difficult to understand why Darwin's Theory of Evolution is so central to people's negative reaction to the Enlightenment and its consequence—the creation of modern society with its increasingly secular nature. Even if one accepts that the universe came into existence some 14,000,000,000 years ago (naturally or as a religious creation event), if one also accepts Darwin's Theory of Evolution, the divine creation of humanity must be pushed back to the creation of life itself. At this point in our understanding, the creation of life was a natural event, a property implicit in the nature of matter. As the complexity of life increases, consciousness and intelligence emerge gradually and, because consciousness is central to the concept of the soul, people fear that their own consciousness may be proved to be a natural consequence of evolution and have nothing to do with the existence of the soul or God.

This fear is not unfounded. A number of biological principles already have been expressed nonorganically, and it soon may be possible to understand the origin of consciousness, and—at least in principle—to show that it can be made to appear in a nonorganic context. The creation of life in the laboratory and the possibility of nonorganic forms of consciousness raise fundamental challenges to the conceptual foundations of all religion. Science, and, in particular, the biological sciences, are beginning to challenge religious world views in a way that is unprecedented.

Those who hold conventional religious beliefs feel threatened because a modern world view that accepts the findings of science, and, in particular, evolution, raise the fear that their lives may lose meaning and direction, and, that without conventional religious beliefs, there no longer will be an ethical basis for behavior. They especially abhor a future bereft of personal immortality. If the origin of life—and humanity—has a natural explanation, how can one believe in the immortal soul, or that humanity is central to God's creation? Belief in the findings of science about our origins not only will destroy the creation myths of humanity, but will force the acceptance of the proposition that impersonal and indifferent forces were behind its creation, along with that of all other living creatures.

More than half a century ago, Homer Smith wrote *Man and His Gods*. In the Epilogue, Smith captures what must happen if the modern world is to avoid what might well be characterized as a social form of Armageddon: "As a fallen angel, man would be ludicrous. As an intelligent animal, he has reason to be proud because he is the first who can ask himself, 'Whither, Why, and Whence?' and confident because he can know himself as a creature of earth who has risen by his own efforts from a low estate. If he would rise higher he must be true to earth, he must accept that he is its creature, unplanned, unprotected and unfavored, conatural with all other living creatures and with the air and water and sunlight and black soil from which their dynamic pattern has been fab-

ricated by impersonal and indifferent forces. In every wish, thought and action he is seeking to escape the same protoplasmic disquietude that impels the meanest flesh crawling beneath his feet. He must find his values and his ends entirely within this frame of reference."

When people come to understand what is at stake, they will not take it lightly. There is hope, though. Much of the conflict and apparent incompatibility between science and religion in general, and Darwinian theory in particular, is due to ignorance about both. Science evokes a sense of awe and wonder about the complexity and beauty of what religious people call creation, but it only answers the how, not the why. First causes are not within its domain of discourse. The acceptance of Carroll's definition of revelation essentially eliminates the conflict between religion and science. Its acceptance would be a crucial first step in ameliorating the growing clash between religion and modernism that plagues the world.

Underlying creationism is the same literal interpretation of Scripture that is behind the rise of intolerant Islam, or the belief by some Jews that Judaea and Samaria were given to them by God. Millions believe that once the Jews recopy all of their biblical lands, the legions of the Antichrist will attack, thus leading to the final conflict in the valley of Armageddon. It no longer is possible to dismiss such beliefs as delusional or marginal. They now play a role in the corridors of power.

An obligation to God

There is an implicit tension between the modern, secular state and an individual's religious orientation—since the obligation to God must, by its very nature, transcend any duty to the state. Communist states resolved the conflict by viewing religion as inherently subversive; Islamists view liberal democracy—with its secular rule of law—as an impiety. Implementation of the Sharia resolves the implicit tension between secular law and religious belief by replacing secular law with laws derived from Holy Scripture. In the end, fundamentalist religious beliefs and secular, liberal democracies are not compatible. The modern world thus far has been able to gloss over this contradiction, but the strains are beginning to make themselves all too apparent.

The so-called Disestablishment Clause of the First Amendment to the Constitution states that, "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." In his address to the Danbury Baptist Association in 1802, Pres. Thomas Jefferson said, "I contemplate with sovereign reverence that act of the whole American people which declared that their legislature should 'Make no law respecting an establishment of religion, or prohibiting the free exercise thereof,' thus building a wall of separation between Church and State." The concept of the "separation between Church and State" dates back to this address. Both the separation of church and

state and the Disestablishment Clause have been a subject of intense debate and litigation ever since.

Yet, from a common sense interpretation, it seems readily apparent that the "wall of separation" was intended to prevent crossing from either side. Otherwise it would be a wall with a one-way gate. Surely Jefferson knew the difference. Regardless of what he may have meant by the "separation between Church and State," and the meaning of the disestablishment clause, as well as the Christian religious origin of the country, if we are to maintain domestic tranquility and preserve our liberal democracy, our government should not be seen as representing any faith at all.

The ubiquitous references to God in almost every political speech, intended to endear the speaker to large swaths of the public who have religion as central to their identity and social institutions, and the phrase, "In God We Trust," the official motto of the U.S.—put into place by Pres. Dwight Eisenhower in 1956, might make many secular people and some religious groups uncomfortable, but they are not in themselves a threat to our liberal democracy, but fundamentalist religious thought is entering the corridors of power through its growing presence in Congress.

Perhaps the best example of this is the claim by Sen. Rick Santorum (R-Pa.) that the separation of church and state is "not the founders' vision." He expanded on his interpretation of the First Amendment by saying, "I don't believe in an America where the separation of church and state are absolute. . . . The idea that the church can have no influence or no involvement in the operation of the state is absolutely antithetical to the objectives and vision of our country. . . ." His comments reinforce the imperative that we must remain vigilant to ensure that there continues to be a separation between church and state and that fundamentalist religious beliefs are not reflected in legislative actions.

We already see far too many people subjected to intolerant religious laws elsewhere in the world—examples that readily come to mind are Pakistan, Afghanistan, and many countries in the Arab world. We have been protected by our Constitution and the rule of law, but we are not immune. One must hope that the drift of society towards modes of thought characteristic of the pre-Enlightenment will reverse itself but, should the social fabric be torn by unforeseen events, we yet may see the forces of ignorance again dominate society and autos-da-fé return to plague those who persist in following in the footsteps of the Enlightenment. ★

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