Mormonism and the New Creationism

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Introduction

In some sense, almost all Latter-day Saints (as well as members of numerous other faiths) would call themselves "creationists." They believe in a God who has overseen the creation of this and other worlds, and they believe that the universe, earth, and humans all have some transcendent purpose. A reasonably open-minded philosophy of this sort is entirely consistent with modern scientific knowledge.

This paper will deal with a more specific form of creationism, which is often termed "creation science" or "scientific creationism" (these terms will be used synonymously). As defined in a 1981 Arkansas law, creation science is the belief in (1) sudden creation of the universe, energy, and life from nothing; (2) the insufficiency of mutation and natural selection in bringing about development of all living kinds from a single organism; (3) changes only within fixed limits of originally created kinds of plants and animals; (4) separate ancestry for man and apes; (5) explanation of the earth's geology by catastrophism, including the occurrence of a worldwide flood; and (6) a relatively recent inception of the earth and living kinds.[1] Advocates of this view, which is obviously Biblical literalism without explicit references to God, Adam, and Noah, hold that there was no life on earth before Eden (a few thousand years ago), and no death before the Fall of Adam.

The creationist movement is currently very strong in the U.S. In a 1991 Gallup poll, 47 percent of the U.S. public, including 25 percent of

1. William J. Overton, "McLean vs. Arkansas Board of Education," court decision, 529 Federal Supplement 1255 (Eastern District of Arkansas 1982), available at http://cnsweb.bu.edu/pub/dorman/McLean_vs_Arkansas.html. See also Niles Eldredge, *The Triumph of Evolution. . .and the Failure of Creationism* (N.Y.: W. H. Freeman, 2000), 93-94.

college students, agreed that "God created man pretty much in his present form at one time within the last 10,000 years."[2] In the early 1980s Arkansas and Louisiana passed laws requiring equal treatment for creation science and evolution in public schools, although courts subsequently ruled these statutes to be unconstitutional. More recently, the Alabama legislature passed a law requiring that public school teachers, prior to discussing evolution, read a disclaimer that it is only a "controversial theory" believed by "some" scientists. It narrowly defeated a measure that would have required, among other things, that teachers instruct students to pencil in "theory only" beside any mention of evolution in textbooks, and "false data" beside any reference to radiocarbon dating. In Kansas, creationists elected a majority to the state school board, which removed mention of an old earth, macroevolution, or the big bang from the state school curriculum, although this action has now been reversed. In Louisiana, the House Education Committee approved a measure that links Darwinism with Hitler and racism. As this article is being written (May 2001), similar creationist efforts are active in Arkansas, Idaho, Michigan, Montana, Nebraska, Oklahoma, Pennsylvania, and Washington.[3]

Surveys of students at Brigham Young University indicate similar trends in the Church of Jesus Christ of Latter-day Saints. In 1935 only 36% of BYU students denied that humans had been "created in a process of evolution from lower life forms," but by 1973 the figure had risen to 81%. The results of a recent (2001) survey in an introductory biology course at BYU suggest that tension and uncertainty over these issues persist. Among students starting Biology 100 (freshmen biology for nonmajors), 48% agreed with a position that while "Evolution might apply to some limited circumstances, it does not occur across boundaries which separate major categories of plants and animals; it may apply to lower forms but not to man" (this was the fourth of five choices, with three more negative towards evolution and one more positive). 21% of these students expressed belief that the earth is only a few thousand years old, based on interpretation of scriptures (the second of five choices), and 50% agreed that creationism and evolution should be given equal time in public schools (the third of five choices). In a similar survey

2. Jeffrey L. Sheler and Joannie M. Schroff, "The Creation," *U.S. News & World Report*, Dec. 23, 1991, p. 59, available at http://www.usnews.com/usnews/news/create.htm.

3. James Glanz, "Evolutionists Battle New Theory of Creation," *New York Times*, April 8, 2001, p.1, available at http://www.nytimes.com/2001/04/08/science/08DESI.html. Some of this information is from Eugenie Scott, director of the National Center for Science Education (personal communication, 2001).

of Zoology 101 students (for freshman zoology majors), the corresponding percentages were 55%, 28% and 57%. For Zoology 475 (for upper-division zoology majors), the figures were 23%, 7% and 29%, respectively. In short, these figures paint a picture of freshmen LDS students who are largely confused and apprehensive about these issues, although much of this tension appears to be removed once students complete rigorous scientific coursework.[4] LDS faculty members at BYU are split on the question of evolution, with almost all in scientific departments affirming the conventional scientific picture, while many in the Department of Religion remain opposed. A popular LDS doctrinal commentary, written by a BYU religion professor, rules out evolution as irreconcilable with fundamental LDS beliefs and holds that there was no death before the Fall of Adam, which occurred only 7,000 years ago.[5]

Given these developments, many Latter-day Saints wonder if they should support the creationist movement. To better understand this issue, we shall examine the historical background of creationism, its connections to the LDS church, the scientific validity of its claims, and, finally, how the religious philosophy behind this movement relates to LDS theology and to modern Christian thought.

Historical Background

Modern-day creationism, including, to some extent, the prevalence of creationist ideas within the modern LDS church, can be traced back to a nineteenth century religious movement which was the predecessor to today's Seventh-day Adventist denomination.

The theory of evolution, which was first described in 1859 in Charles Darwin's *Origin of the Species*, initially sparked a backlash among many religious leaders. However, even by the end of the nineteenth century, Christians of various denominations began to acknowledge the basic framework of the evolutionary, old-earth worldview. They typically accommodated the facts of geology either by interpreting the "days" of Genesis to represent vast ages (the "day-age" theory) or by distinguishing a creation "in the beginning" from a subsequent creation in the Garden of Eden (the "gap" theory). Either way, Christians could accept the results of geological and paleontological research, while at the same time retaining their beliefs in the Bible as the Word of God. William Jennings Bryan, the outspoken lawyer who led the anti-evolution crusade in the 1920s,

4. Survey of biology students at BYU, conducted by Prof. William Bradshaw of BYU, 2001.

5. Joseph Fielding McConkie, *Answers: Straightforward Answers to Tough Gospel Questions*, (Salt Lake City: Deseret Book, 1998), 155-165.

interpreted the "days" of Genesis as geological eras and allowed for limited evolution.

At about this same time, the self-taught geologist George McCready Price started the modern creationist movement. Price was a devout member of the Seventh-day Adventist Church, which was founded in the nineteenth century by Ellen G. White. One of White's key teachings is that the fourth commandment mandates Saturday worship and a literal belief in Genesis. In one of her visions, she was shown that the creation week was "just like every other week." In subsequent writings she taught that Noah's flood was a worldwide event, and that after the flood waters had subsided, God caused "a powerful wind to pass over the earth," which buried the dead animals with trees, stone, and earth. These buried forests then became coal and oil, which God occasionally ignited to produce earthquakes and volcanoes.[6]

As a student who wrestled with the teachings of geology and biology, Price was intrigued by White's picture of the creation. In several books he subsequently authored, Price declared that much of modern science is "in the highest degree improbable and absurd." He focused his attack on geology, charging that geologists date rocks by their fossil content, while simultaneously determining the age of the fossils by their location in the geological column. Following White, Price asserted a recent creation and a literal Noah's flood. To Price, the flood explained why the fossils appear in a predictable sequence—the flood waters first killed smaller animals, followed by vertebrate fishes, and finally larger animals and man, who fled to the hilltops from the rising waters. Price, again echoing White's teachings, suggested that a miraculous "cosmic storm" buried their bodies. Thus the fossil record reveals merely a sorting of contemporaneous antediluvian life forms, and the conventional geological column is a delusion.[7] Price's book, *The New Geology*, which was first published in 1923, has sold over 15,000 copies.[8]

The most influential creationist work in recent decades is Whitcomb's and Morris's *The Genesis Flood*, which was first published in 1961. Following the same overall outline as Price's works, this book starts with an affirmation of the authority and infallibility of the Bible. These authors argue, as did Price, that since the scriptures clearly describe a universal flood, Christian believers have only two choices: reject God's

6. Ellen G. White, *Spiritual Gifts: Important Facts of Faith, in Connection with the History of Holy Men of Old* (Battle Creek, Mich.: Seventh-day Adventist Publishing Association, Battle Creek, 1864), 90-91; cited in Ronald L. Numbers, *The Creationists* (Berkeley, Calif.: University of California Press, 1993), 74.

7. Numbers, *The Creationists*, 76-77.

8. George McCready Price, *The New Geology* (Mountain View, Calif.: Pacific Press, 1923).

inspired Word or reject the testimony of thousands of professional geologists. According to the authors, God created the entire universe and populated the earth with fully grown plants, animals, and human beings, all in six literal days, using methods and processes completely different from those now in operation in the universe. There was no death before the Fall, so consequently all fossils are the remains of animals which perished subsequent to the Fall. The authors reject the conventional geological column as Price did, by attributing the apparent order of fossils to hydrodynamic sorting of organisms in the flood waters and the superior mobility of vertebrates. They acknowledge that by some indications the earth and the universe appear to be very old (for example, the evidence of light rays streaming to earth from stars millions of light years away), but an omnipotent Creator could easily have created them with the "appearance of age." One interesting item in this book is its mention of "human" footprints found together with dinosaur tracks near the Paluxy River in Glen Rose, Texas. This contradicts the notion that humans appeared many millions of years after dinosaurs became extinct.[9]

A more recent creationist work is Morris's *Scientific Creationism*, which was published in 1974. One of Morris's arguments for a young earth is based on space dust. Morris argues that if the moon is really as old as scientists claim, then it should be buried in over 180 feet of dust. Given that the astronauts found only a fraction of an inch, the moon (and the earth, by similar reasoning) must be much younger. Morris also argues that the second law of thermodynamics (a scientific principle that closed systems tend to evolve into increasingly disordered states) fundamentally forbids biological evolution.[10]

One other popular creationist work is Duane Gish's *Evolution: The Fossils Say No!* In this book Gish focuses on gaps in the fossil record. He argues that for some of these gaps, such as the transition between land mammals and sea mammals, it is biologically impossible that suitable intermediate species could exist.[11]

The LDS Connection

In the 1920s, LDS Apostle Joseph Fielding Smith became enamored with Price's writings. He was particularly impressed by Price's syllo-

9. John C. Whitcomb, Jr., and Henry M. Morris, *The Genesis Flood: The Biblical Record and Its Scientific Implications* (Philadelphia: Presbyterian and Reformed Publishing Co., 1961, reprinted 1998), xx, 118, 120, 174, 223, 232-33, 238, 273-75, 344-45, 473.

10. Henry M. Morris, *Scientific Creationism* (El Cajon, Calif.: Creation-Life Publishers, 1974; 2d ed., 1985; reprint, 2000), 38-46, 151-53.

11. Duane T. Gish, *Evolution: The Fossils Say No!* (El Cajon, Calif.: Creation-Life Publishers, 1973).

gism, "No Adam, no fall; no fall, no atonement; no atonement, no savior." He corresponded with Price, encouraging him in his efforts to defeat evolution, and then began writing a manuscript laying out what he regarded as the LDS case against evolution.[12]

In 1931 a dispute arose between LDS leaders Joseph Fielding Smith, Brigham H. Roberts, and James E. Talmage. Smith wanted to publish his anti-evolution manuscript, but Roberts wanted to publish his own manuscript, which acknowledged a conventional old-earth view and the existence of "pre-Adamites." In the course of these discussions, Smith promoted Price's book *The New Geology*. Talmage, as a degreed geologist, recognized the strength of evidence for modern geology and biology. While a student at Johns Hopkins University, he had recorded in his journal that he could see no reason "why the evolution of animal bodies cannot be true."[13] As a result, he was highly skeptical of Price's work, but lacking time to investigate he wrote to his son Sterling Talmage, a professor of geology and mineralogy at the New Mexico School of Mines.

Sterling replied that *The New Geology* was not new, nor did it contain any real geology. He then quipped, "With these two corrections, the title remains the best part of the book." Sterling added that most of Price's arguments were "absurd."[14] Meanwhile the debate over evolution among the LDS leaders was stopped by the First Presidency, who declared in a letter, "Leave geology, biology, archaeology and anthropology, no one of which has to do with the salvation of the souls of mankind, to scientific research, while we magnify our calling in the realm of the Church."[15]

In 1954, after Roberts and the senior Talmage had passed away, Joseph Fielding Smith reworked his manuscript on evolution into the book *Man: His Origin and Destiny*. In this book, Smith argued that not only is the theory of evolution unacceptable for doctrinal reasons, but—citing creationist writers such as Price—it is scientifically invalid as well.[16] David O. McKay, who was president of the church at the time (and who personally accepted the basics of biological evolution), reassured several people who wrote to his office that Joseph Fielding Smith's book contained only the author's opinion, and that the church did not

12. Sterling B. Talmage, *Can Science Be Faith Promoting?* (Salt Lake City: Blue Ribbon Books, 2001), 190-95.

13. Jeffrey E. Keller, "Discussion Continued: The Sequel to the Roberts/Smith/Talmage Affair," *Dialogue* 15 (Spring 1982): 79-94.

14. Talmage, *Can Science Be Faith Promoting?*, 181-89.

15. Richard Sherlock, "We Can See No Advantage to a Continuation of the Discussion: The Roberts/Smith/Talmage Affair," *Dialogue* 13 (Fall 1980), 63-78.

16. Joseph Fielding Smith, *Man: His Origin and Destiny* (Salt Lake City: Deseret Book, 1954).

have an official view on the subject of evolution.[17] Nevertheless, many of Smith's views were subsequently incorporated into his son-in-law Bruce R. McConkie's book, *Mormon Doctrine*, which today, nearly forty years after its original publication, remains the most widely cited LDS doctrinal reference.[18]

In the meantime, an LDS scientist gave a substantial boost to the nascent creationist movement. Dr. Melvin A. Cook, professor of metallurgy at the University of Utah and an internationally renowned explosives expert, was impressed by the arguments of Price, as well as by the teachings of Joseph Fielding Smith. After studying the technique of radiocarbon dating, he declared in 1961 that these dates should be telescoped down to a mere 13,000 years, in keeping with the notion that the seven days of creation each represent 1,000 years and that 6,000 years have transpired since creation. He was similarly critical of radiometric dating techniques and other underpinnings of modern geology. Other LDS scientists, including the renowned chemist Dr. Henry Eyring of the University of Utah, dismissed Cook's views, but Cook continued his work and subsequently published two creationist books.[19] Cook was invited to join the newly organized Creation Research Society, and he frequently published articles in its quarterly journal. Cook's international reputation lent substantial credibility to the Society. Cook was awarded the Nitro Nobel Gold Medal, which is granted periodically for outstanding contributions to the field of explosives, in the same year that his articles began to appear in *Creation Research Quarterly*.

The New Creationism

Within the past few years a new group of creationists has arisen who have adopted a somewhat different strategy than their predecessors. They downplay some of the more controversial notions of creationism, such as flood geology and a recent six-day creation, and focus on a smaller set of fundamental notions, sanitized of explicit references to religious doctrine. According to U.C. Berkeley law professor Phillip Johnson, one of the central figures in this movement, the key notion of the creationist worldview is that there exists a personal Creator (an "Intelligent Designer") who is supernatural and who initiated and continues to control

17. Talmage, *Can Science Be Faith Promoting?*, xlii; see also Sterling M. McMurrin and L. Jackson Newell, *Matters of Conscience* (Salt Lake City: Signature Books, 1996), 198.

18. Bruce R. McConkie, *Mormon Doctrine*, 2d ed. (Salt Lake City: Bookcraft, 1966).

19. Melvin A. Cook, *Prehistory and Earth Models* (London: Max Parrish, 1966); Melvin A. Cook and M. Garfield Cook, *Science and Mormonism* (Salt Lake City: Deseret News Press, 1967).

the process of creation, in furtherance of some end or purpose.[20] Collectively this new group of creationists are often referred to as intelligent design creationists (IDC), as distinguished from young-Earth creationists (YEC), a term used for the more traditional creationist community.

Johnson argues that there is a fundamental and unproven dogma underlying much of modern science, especially evolution. This is the assumption of scientific naturalism, namely the philosophy that empirical nature is the only reality about which we can have solid knowledge. As a result, Johnson argues, the hypothesis that a God or an Intelligent Designer was involved in the creation of life on earth is, in effect, excluded from scientific discourse. He suggests that if scientists removed their naturalistic blinders, they might see the creation in an entirely new light.[21] Johnson frequently attacks the theory of evolution, arguing for example that the fossil record does not indicate smooth transitions between major branches of the biological kingdom.[22]

Another leader of the IDC school is Michael Behe of Lehigh University. He argues that certain biological features are "irreducibly complex," which means they are composed of several interacting parts, of which the removal of any one would cause the system to cease functioning. He cites as examples the complex molecular machinery involved in vision, blood clotting, and movement of flagella. He then argues that it is impossibly unlikely that these components could have separately evolved, only later to fit into the unified system we see in an organism today.[23] In a similar vein, IDC creationist David Foster argues, drawing from an earlier work by astronomer Fred Hoyle, that the probability of forming the alpha-hemoglobin protein of human blood is so remote that it is extremely unlikely for it ever to have formed solely by natural evolution.[24]

Despite their outwardly open-minded approach to the creation, the IDC community has no tolerance for evolution, even theistic evolution, namely the belief that God directs the course of evolution. William Dembski, a prominent IDC writer, makes this clear: "Design theorists are no friends of theistic evolution. As far as design theories are concerned, theis-

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20. Robert T. Pennock, *Tower of Babel: The Evidence against the New Creationism* (Boston: MIT Press, 1999), 30.

21. Phillip E. Johnson, "The Church of Darwin," *Wall Street Journal*, Aug. 16, 1999, available at http://www.arn.org/docs/johnson/chofdarwin.htm.

22. Phillip E. Johnson, *Darwin on Trial* (Washington: Regnery Gateway, 1991), 75.

23. Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (N.Y.: Free Press, 1996), 39.

24. David Foster, *The Philosophical Scientists*, (NY: Barnes & Noble Books, 1993); see also Fred Hereen, *Show Me God: What the Message from Space is Telling Us about God* (Wheeling, Ill.: Searchlight Publications, 1995), 94.

tic evolution is American evangelicalism's ill-conceived accommodation to Darwinism."[25] Phillip Johnson is even more explicit: he describes the IDC strategy as a "wedge," designed to split the ranks of theistic evolutionists and others who hold that evolution is compatible with religion.[26]

The Scientific Evidence

Michael Ruse, a philosopher of science who testified in the 1981 Alabama creationism case, describes science as a discipline that (1) is guided by natural law; (2) is explanatory by reference to natural law; (3) is testable against the empirical world; (4) reaches conclusions that are tentative; and (5) is falsifiable.[27] How does creationism, new or old, measure as a scientific theory? For that matter, what is the status of the scientific view of the formation of the earth and life upon it?

At this point in time, the conventional scientific picture of the earth as approximately 4.5 billion years old, with fossil remnants of the branching tree of creation extending from primitive bacteria in the distant past to flowering plants and vertebrates several hundred million years ago, and ultimately to *homo sapiens* during the past million or so years, is very well established. Geological dates are particularly well established, confirmed by numerous independent schemes, many of which rely on fundamental nuclear processes such as radioactivity and fission. These processes are well understood based on the laws of quantum mechanics. Quantum mechanical laws, in turn, are observed to be operating in distant stars, based on spectral measurements of light rays which departed the stars millions or even billions of years ago. Thus scientists have very good reasons to infer that these processes are completely reliable as clocks into the distant past. Biologist Kenneth Miller has observed, "The consistency of the data. . .is nothing short of stunning."[28] Readable discussions of the dating schemes currently used by geologists are available from several sources.[29]

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25. William A. Dembski, "What Every Theologian Should Know about Creation, Evolution and Design," *Center for Interdisciplinary Studies Transactions* 3, no. 2 (1995): 15-21, available at http://www.origins.org/offices/dembski/docs/bd-theologn.html. See also Pennock, *The Tower of Babel*, 31.

26. Phillip E. Johnson, *Defeating Darwinism* (Downers Grove, Ill.: InterVarsity Press, 1997), 92. See also Pennock, *The Tower of Babel*, 41.

27. Pennock, *The Tower of Babel*, 5.

28. Kenneth R. Miller, *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution* (N.Y.: Cliff Street Books, 1999), 76.

29. Eldredge, *The Triumph of Evolution*, 103-109; Miller, *Finding Darwin's God*, 63-80; Chris Stassen, "The Age of the Earth," 1997, available at http://www.talkorigins.org/faqs/faq-age-of-earth.html.

Until recently, paleontologists had to rely on a spotty fossil record to infer the course of evolution during past eras. Evolutionary closeness in the biological tree of life was often inferred by similarity in bone structure and organs, but in the past few decades, some powerful new tools have arisen, including comparisons of DNA and amino acid sequences. These new tools have confirmed, with very few exceptions, the traditional taxonomy of the biological world. Indeed, by carefully comparing DNA and amino acid sequences between different species, one can estimate relative times to evolutionary branching events in the past. To cite one well-known example: The 141-amino-acid-long alpha-hemoglobin molecule in humans is identical with that of chimpanzees, differs by one location in gorillas, by eighteen in horses, by twenty-five in rabbits, and by approximately one hundred locations in various fish species.[30]

As any responsible scientist will readily admit, the theory of evolution is still a theory in the sense that there are many details still to be pinned down. First, the origin of the earliest reproducing molecules and organisms is somewhat of a mystery, although some intriguing discoveries have been announced along this line in recent years.[31] Second, the specific course taken by the millions of known species, ancient and modern, will require many more years to be thoroughly understood. Third, the relative roles of natural selection, mutations, environmental change, and catastrophes (such as asteroid impacts) are still being debated. But the central notion that an evolutionary process has occurred over many millions of years is not seriously in doubt.

With regard to the creationist theories, it should first be noted that while the YEC and IDC scholars write articles for their own creationist publications, as far as anyone can tell they have not yet attempted to publish articles in conventional, peer-reviewed scientific journals. What are we to make of some of the specific issues raised by creationists? There is not room in this paper to present a complete analysis of these claims, so I will comment briefly on just a few items. For further discussion of these issues, readers are referred to books by Eldredge, Miller, and Pennock.[32] There is also some interesting material in the Talk.Origins archive, which is located on the web at http://www.talkorigins.org.

Space dust. As mentioned above, Henry Morris and others have argued that the moon can't be as old as ordinarily thought, because other-

30. Fred Hoyle and Chandra Wickramasinghe, *Evolution from Space* (London: J. M. Dent and Sons, 1981), 17.

31. Paul Davies, *The Fifth Miracle: The Search for the Origin and Meaning of Life* (N.Y.: Simon and Schuster, 1999).

32. Eldredge, *The Triumph of Evolution*; Miller, *Finding Darwin's God*; and Pennock, *The Tower of Babel*.

wise it would be covered with some 180 feet of dust. This claim is based on a 1960 study, published in *Scientific American*, of the space dust infall rate, estimated from measurements made at the summit of Mauna Loa in Hawaii.[33] However, when the actual space dust flow rate was later directly measured by spacecraft, the result was lower by factor of more than 100. When this and other adjustments are made to the calculation, the result is completely consistent with what the astronauts found on the moon.[34]

These facts were made known to the creationist community at least twenty-five years ago, yet creationist speakers and authors continue to promote their argument. For example, it appears in the latest (2000) printing of Morris's *Scientific Creationism*.[35] This circumstance has prompted one scientist, himself a Christian theist, to comment, "The continuing publication of those claims by young-earth advocates constitutes an intolerable violation of the standards of professional integrity that should characterize the work of natural scientists."[36]

Paluxy River tracks. Whitcomb and Morris drew attention to "human" footprints and dinosaur tracks side-by-side near the Paluxy River in Texas. A team of anthropologists who subsequently examined this site found that the "human" footprints were 16 to 22 inches long. Subsequent analysis of subtle coloration effects confirmed that the "human" toe marks were dinosaurian. Based on such results, in 1988 an evangelical scientist wrote that it was no longer appropriate for creationists to use the Paluxy River tracks as evidence against evolution.[37] Nevertheless, the tracks are mentioned in the latest printings of *The Genesis Flood* (1998) and *Scientific Creationism* (2000), and they were also featured in the 1995 NBC broadcast *Mysterious Origins of Man*, narrated by Charlton Heston, which claimed that much of the traditional scientific account is false.[38]

The second law of thermodynamics. For years creationists have cited the second law of thermodynamics (a principle that closed systems tend to evolve to increasingly disordered states) as fundamental evidence that

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33. Hans Peterson, "Cosmic Spherules and Meteoritic Dust," *Scientific American* 202 (Feb. 1960): 132.

34. Pennock, *The Tower of Babel*, 222.

35. Morris, *Scientific Creationism*, 151-53.

36. Howard J. Van Till, Davis A. Young, and Clarence Menninga, *Science Held Hostage: What's Wrong with Creation Science AND Evolutionism* (Downers Grove, Ill.: InterVarsity Press, 1988), 82. See also Pennock, *The Tower of Babel*, 223.

37. Ronnie J. Hastings, "The Rise and Fall of the Paluxy Mantracks," *Perspectives on Science and Christian Faith* 40, no. 3 (1988): 144-55.

38. Whitcomb and Morris, *The Genesis Flood*, 174; Morris, *Scientific Creationism*, 122; Eldredge, *The Triumph of Evolution*, 129; Pennock, *The Tower of Babel*, 220.

biological evolution cannot occur. However, those who cite it ignore or downplay the key condition, a "closed system," namely a system that has no influx or outflow of energy. The earth's biosphere is clearly not a closed system, since prodigious amounts of energy are received daily from the sun, and there is also heat generated by radioactive processes within the earth itself. This energy is more than enough to account for the evolution of life on earth. Indeed, life can be thought of as a process which creates order from its environment by extracting energy. Some creationists have discontinued using this argument, but it is promoted at length in the latest printing (2000) of *Scientific Creationism*, and it is also featured prominently in the museum of the Institute for Creation Research in San Diego.[39] Additional background on evolution and the second law of thermodynamics can be obtained from several sources.[40]

Gaps in the fossil record. Creationists have long assailed geologists and biologists for gaps in the fossil record. It is certainly true that gaps exist, particularly in sections of the geological column for which there are few accessible fossil sites. In addition, scientists now recognize that the fossil record documents periods of relative stability, punctuated with periods of rapid change. However, many of these gaps have been filled during the past few decades with discoveries of transitional fossils. These include several of the gaps which creationists Gish and Johnson claimed could not be bridged.[41]

Out-of-order fossil layers. In several locations, including a region of Montana and Canada, fossil layers appear out of their normal order, but these cases are readily explained by "over-thrusting," namely the movement of one section of rock over another, a phenomenon that can be verified by visual inspection.[42]

No observed speciation today. Creationists claim that since we do not observe new species arising today, it is speculation on the part of evolutionists to assert that this has happened throughout the history of the world. It is true that large-scale transitions have not been observed in historical times, doubtless due to the fact that they normally require

39. Morris, *Scientific Creationism*, 38-46; Pennock, *The Tower of Babel*, 47.

40. Eldredge, *The Triumph of Evolution*, 96-97; Pennock, *The Tower of Babel*, 78-82; Frank Steiger, "The Second Law of Thermodynamics, Evolution, and Probability," 1997, available at http://www.talkorigins.org/faqs/thermo/probability.html.

41. Eldredge, *The Triumph of Evolution*, 120-34; Miller, *Finding Darwin's God*, 81-128, 264-65; John N. Wilford, "Feathered Dinosaur Fossils Are Unearthed in China," *New York Times*, April 26, 2001, available at

http://www.nytimes.com/2001/04/26/.science/26DINO.html. For a listing of many known transitional fossils, see Kathleen Hunt, "Transitional Vertebrate Fossils FAQ," 1997, available at http://www.talkorigins.org/faqs/faq-transitional.html.

42. Eldredge, *The Triumph of Evolution*, 110-13.

many thousands of years, but several more modest speciation events have been documented.[43]

Irreducible complexity. IDC creationist Michael Behe's principal argument against evolution is that certain biological systems, such as vision or blood clotting, consist of multiple subsystems, the removal of any one of which would render the system nonfunctional. The main difficulty with this argument is that Behe does not convincingly establish that irreducibly complex systems cannot arise by natural evolution. As biologist Allen Orr explains, "an irreducibly complex system can be built gradually by adding parts that, while initially just advantageous, become—because of later changes—essential."[44] Miller points out that several specific examples highlighted by Behe have been studied at length by biologists, and credible evolutionary pathways have been identified.[45]

Probability. Some of the creationists' most impressive arguments against evolution involve probability calculations, so I will respond to this issue in some detail. One argument goes like this: The human alpha-hemoglobin molecule, which plays a key oxygen transfer function, is a protein chain based on a sequence of 141 amino acids. There are twenty different amino acids common in living systems, so the number of different chains is 20^{141}, or roughly 10^{183} (i.e., a one followed by 183 zeroes). If five billion years ago, all available material on the surface of the earth were organized into random generators of amino acid chains, then by now only about 10^{66} sequences would have been generated. Thus the probability that human alpha hemoglobin would have been produced is about $10^{66} \div 10^{183} = 10^{-117}$, a fantastically small number. Thus no conventional theory of molecular evolution can account for the origin of human alpha-hemoglobin.[46]

However, this argument ignores the fact that most of the 141 amino acids can be changed without altering the key oxygen transfer function—witness that alpha-hemoglobin in fish differs by about one

43. Miller, *Finding Darwin's God*, 50-53. For some recently reported speciations, see Darren E. Irwin, Staffan Bensch, and Trevor D. Price, "Speciation in a Ring," *Nature* 409 (Jan. 18, 2001): 333-37; David B. Wake, "Speciation in the Round," *Nature* 409 (Jan. 18, 2001): 299-300; Joseph Boxhorn, "Observed Instances of Speciation," 1995, available at http://www.talkorigins.org/faqs/faq-speciation.html.

44. H. Allen Orr, "Darwin vs. Intelligent Design (Again)," *Boston Review* 21, no. 6 (1997), available at http://bostonreview.mit.edu/br21.6/orr.html. See also Pennock, *Tower of Babel*, 270.

45. Miller, *Finding Darwin's God*, 129-64.

46. Foster, *The Philosophical Scientists*; Hereen, *Show Me God*, 94; Hoyle and Wickramasinghe, *Evolution from Space*, 19; Pennock, *The Tower of Babel*, 231; David H. Bailey, "Evolution and Probability," *Report of the National Center for Science Education* 20, no. 4 (2001), available from http://www.dhbailey.com.

hundred locations from that of humans. When we revise the calculation above, based on only twenty-five locations essential for the oxygen transport function, we obtain 10^{33} fundamentally different chains. This is still a very large number, but it is vastly smaller than 10^{183}. Biologists do not believe that alpha-hemoglobin arose by chance—more likely it arose via numerous intermediate steps—but nonetheless the above probability argument falls apart. It is at best inconclusive.

Another way to better appreciate the difficulties with probability arguments (and also with arguments based on the second law of thermodynamics) is to consider snowflakes. Bentley and Humphrey's book *Snow Crystals* includes over 2000 high-resolution black-and-white photos of real snowflakes, many with intricate yet highly regular patterns.[47] What are the chances that one of these structures can form at random? We can calculate the probability that the pattern in one sector will be identical (to within a reasonable accuracy) with the five patterns in other sectors; it is roughly 10^{-2500}. This probability figure is more extreme than any I have seen in anti-evolution literature. Further, the spontaneous formation of a snowflake appears to violate the second law of thermodynamics. Is this proof that God creates individual snowflakes?

The fallacy in this line of reasoning is the fundamental assumption that a snowflake forms all at once as a random assembly of water molecules. It does not—it is the product of a long series of steps acting under physical laws of atomic interactions. A snowflake's six-way symmetry is merely a reflection of an underlying six-way symmetry in the molecular structure of water. Snowflakes also violate the second law of thermodynamics only if one ignores the fact that the formation of a snowflake requires a certain (very small) amount of energy.

A naturalistic assumption. As noted above, one of Phillip Johnson's dominant themes is that underpinning much of modern science is an assumption of scientific naturalism, which excludes the hypothesis of an Intelligent Designer. Here science must respond, "Guilty as charged." One of the characteristics of the scientific methodology is that it seeks natural laws and processes to explain natural phenomena, and empirical tests are the arbiter of truth. This naturalistic methodology, while distasteful to some, forces the researcher to always press on in his or her search, and has proven to be an extremely fruitful approach for scientific investigation.

By contrast, the hypothesis of an Intelligent Designer can be invoked literally anytime a scientist wishes: Nature must be this way because an Intelligent Designer made it that way, and it is futile (and possibly dis-

47. W. A. Bentley and W. J. Humphreys, *Snow Crystals* (N.Y.: Dover Publications, 1962).

respectful) to seek any further explanation. At least the YEC community offers some concrete hypotheses, such as their claim that the creation of the earth took place approximately 6,000 years ago, producing all species of plants and animals currently on earth. These are testable hypotheses (and by any reasonable standard, they have been falsified), but the IDC community declines to describe its Designer, except to say that it is "omnipotent" (meaning not subject to the laws of the universe) and "inscrutable" (meaning utterly beyond our comprehension). Such hypotheses do not lead to empirically testable conclusions. Thus while the Intelligent Designer hypothesis may be an acceptable religious concept in some faiths, it is not an acceptable scientific notion.[48]

Creationism and LDS Theology

We have seen that creationism, old or new, fares rather poorly when measured against accepted standards of scientific research, but how does creationism fare from a religious point of view, and in particular from the perspective of LDS theology?

As mentioned above, creationism is founded first and foremost on an infallible Bible. By contrast, the LDS church believes that while the Bible is the Word of God, there are several important caveats: (1) the Bible is incomplete, since revelation continues; (2) it has numerous errors of translation; (3) "plain and precious" material has been dropped; (4) certain segments (such as the Song of Solomon) are of dubious inspiration; (4) certain passages (such as Eve being formed from Adam's rib) should be interpreted figuratively; and (5) the Bible and other LDS scriptures are subject to official interpretation by the First Presidency—the scriptural texts themselves are not the final authority. With regard to figurative passages, Joseph Fielding Smith once wrote:

> Even the most devout and sincere believers in the Bible realize that it is, like most any other book, filled with metaphor, simile, allegory, and parable, which no intelligent person could be compelled to accept in a literal sense. . . .
>
> The Lord has not taken from those who believe in his word the power of reason. He expects every man who takes his "yoke" upon him to have common sense enough to accept a figure of speech in its proper setting, and to understand that the holy scriptures are replete with allegorical stories, faith-building parables, and artistic speech. . . .
>
> Where is there a writing intended to be taken in all its parts literally? Such a writing would be insipid and hence lack natural appeal. To expect a believer in the Bible to strike an attitude of this kind and believe all that is

48. Pennock, *The Tower of Babel*, 185-206.

> written to be a literal rendition is a stupid thought. No person with the natural use of his faculties looks upon the Bible in such a light.[49]

With regards to the creation scriptures themselves, most LDS leaders have been reasonably flexible in their interpretations. For example, Brigham Young declared:

> As for the Bible account of the creation we may say that the Lord gave it to Moses, or rather Moses obtained the history and traditions of the fathers, and from these picked out what he considered necessary, and that account has been handed down from age to age, and we have got it, no matter whether it is correct or not, and whether the Lord found the earth empty and void, whether he made it out of nothing or out of the rude elements; or whether he made it in six days or in as many millions of years, is and will remain a matter of speculation in the minds of men unless he give revelation on the subject.[50]

In the twentieth century, James E. Talmage, mentioned above in the 1931 dispute over evolution, offered similar guidance:

> The opening chapters of Genesis, and scriptures related thereto, were never intended as a textbook of geology, archaeology, earth-science, or man-science. Holy Scripture will endure, while the conceptions of men change with new discoveries. We do not show reverence for the scriptures when we misapply them through faulty interpretation.[51]

A second arena of contrast between creationism (YEC or IDC) and LDS theology regards God and natural law. Recall, for instance, the IDC notion of an "omnipotent" and "inscrutable" Designer. In contrast, Joseph Smith taught that God works in accordance with natural laws, rather than by transcending natural laws: "True science is a discovery of the secret, immutable and eternal laws, by which the universe is governed."[52] He specifically disavowed the notion of creation *ex nihilo* (out of nothing).[53] These sentiments were amplified by Brigham Young, Brigham H. Roberts, and others.[54]

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49. Joseph Fielding Smith, *Doctrines of Salvation* (Salt Lake City: Bookcraft, 1956), 3:188-90.

50. *Journal of Discourses* (London: Latter-day Saints Book Depot, 1873) 15:127.

51. James E. Talmage, "The Earth and Man," Tabernacle address, Aug. 9, 1931, published in pamphlet form by LDS church.

52. *Times and Seasons* 4:46.

53. D&C 93:33.

54. *Journal of Discourses* (London: Latter-day Saints Book Depot, 1872) 14:116; Brigham H. Roberts, *The Mormon Doctrine of Deity* (1903; reprint, Bountiful, Utah: Horizon Publishers, 1982), 95-114.

Such principles naturally lead to a philosophy that seeks harmony between science and religion. As Brigham Young wrote, "In these respects we differ from the Christian world, for our religion will not clash with or contradict the facts of science in any particular."[55] John A. Widtsoe also urged accommodation, not conflict, with scientific research: "Scientific truth cannot be theological lie. To the sane mind, theology and philosophy must harmonize. They have the common ground of truth on which to meet."[56]

A third area of contrast is the question of the age of the earth, and whether there was death before the Fall of Adam. While some authorities have advocated literalist views here, others have been more flexible. James E. Talmage acknowledged the fossil record of countless generations of plants and animals, which "lived and died, age after age, while the earth was yet unfit for human habitation."[57] Brigham H. Roberts wrote:

> [T]o limit and insist upon the whole of life and death to this side of Adam's advent to the earth, some six or eight thousand years ago, as proposed by some, is to fly in the face of the facts so indisputably brought to light by the researcher of science in modern times....To pay attention to and give reasonable credence to their research and findings is to link the church of God with the highest increase of human thought and effort. On that side lies development, on the other lies contraction. It is on the former side that research work is going on and will continue to go on, future investigation and discoveries will continue on that side, nothing will retard them, and nothing will develop on the other side. One leads to narrow sectarianism, the other keeps the open spirit of a world movement with which our New Dispensation began. As between them which is to be our choice?"[58]

As noted above, Joseph Fielding Smith adopted a comparatively literal approach to the age of the earth, evolution and related issues, and these views were largely incorporated into McConkie's popular *Mormon Doctrine* (and were a source of the concern raised among top LDS authorities when this book was first published).[59] Yet it is clear from several studies of the church's posture toward science through the years that the Smith-McConkie approach is somewhat of an anomaly. A number of the

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55. *Journal of Discourses* 15:127.

56. John A. Widtsoe, *Joseph Smith as Scientist* (Salt Lake City: Bookcraft, 1908; reprint, 1964), 156.

57. Talmage, "The Earth and Man," 1931.

58. Brigham H. Roberts, *The Truth, the Way, the Life: An Elementary Treatise on Theology*, ed. Stan Larson (1931; reprint, Salt Lake City: Smith Research Associates, 1994; also Provo, Utah: BYU Studies, 1994), 364.

59. David O. McKay diary, entries dated Jan. 7-8, 14, 27, 28, 1960, transcript in author's possession.

early LDS leaders, as well as several of the present-day authorities, have recognized the futility of battling the scientific world and have favored a more progressive approach to these questions.[60]

For example, Elder Russell M. Nelson, in the April 2000 general conference, advocated a flexible interpretation of the seven days of creation: "Whether termed a day, a time, or an age, each phase was a period between two identifiable events—a division of eternity."[61] Further, the First Presidency now sends, to those who inquire about evolution, a short statement concluding with the summary quote from its 1931 letter (mentioned above): "Leave geology, biology, archaeology and anthropology, no one of which has to do with the salvation of the souls of mankind, to scientific research, while we magnify our calling in the realm of the Church." The text of this statement follows the article "Evolution" in the *Encyclopedia of Mormonism*, which was prepared with specific direction from top church leaders.[62] Along this line, current LDS church President Gordon B. Hinckley recently stated that the church requires only belief "that Adam was the first man of what we would call the human race." Recalling his own study of anthropology and geology, Hinckley said, "Studied all about it. Didn't worry me then. Doesn't worry me now."[63]

One final area of contrast between creationism and LDS theology regards the creationist notion that the earth and the universe may have an "appearance of age," and life on earth may suggest an evolutionary process, but this is because an omnipotent Creator created them that way, as part of an inscrutable plan.[64] Despite valiant efforts by creationists to rationalize this doctrine, it remains an exceedingly distasteful notion. Needless to say, this notion is utterly at odds with the LDS concept of a rational, comprehensible God, one who declared, "The Glory of God is intelligence; in other words light and truth."[65] Latter-day Saints are hardly alone in rejecting this notion. Catholic biologist Kenneth Miller writes, "In order to defend God against the challenge [creationists] see from evolution, they have to make him into a schemer, a trickster, even a charlatan. Their version of God is one who intentionally plants misleading clues beneath our feet and in the heavens themselves. . . .To embrace that God, we must reject science and worship deception itself."[66]

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60. Duane Jeffery, "Seers, Savants and Evolution: The Uncomfortable Interface," *Dialogue* 8 (Autumn 1974): 41-75; Erich R. Paul, *Science, Religion, and Mormon Cosmology* (Chicago: University of Illinois Press, 1992).

61. Russell M. Nelson, "The Creation," *Conference Report*, April 2000.

62. Daniel H. Ludlow, ed., *The Encyclopedia of Mormonism* (N.Y.: Macmillan, 1992), 2:478.

63. Larry A. Witham, *Where Darwin Meets the Bible*, (NY: Oxford University Press, 2002): 176-77.

64. Whitcomb and Morris, *The Genesis Flood*, 233-39; Morris, *Scientific Creationism*, 209-10.

65. D&C 93:36.

66. Miller, *Finding Darwin's God*, 80.

LDS scientists on the faculty at Brigham Young University universally reject (as far as I am aware) the young-earth creationist worldview. Many are sympathetic to a more general creationist philosophy, but only to the extent that such a philosophy is consistent with well-established principles of physical and biological science. University administration officials and others have attempted from time to time to impose creationist biology at the school, but these efforts have been scuttled.[67] Along this line, in 1992 the BYU Board of Trustees approved a packet of information regarding evolution to be provided for interested students at the university. It includes a few statements by first presidencies of the church and conveys a generally balanced, open-minded stance on the issue.[68]

I should add that recently some excellent books have been published by LDS scientists on these topics. Sterling B. Talmage's book, *Can Science Be Faith-Promoting?*, and the Stephens-Meldrum book, *Evolution and Mormonism: A Quest for Understanding*, are particularly recommended.[69]

Creationism and Modern Christian Thought

It should be noted that the creationist movement is endorsed by only a relatively small sector of the Christian community. Most mainline Protestant denominations made peace with evolution and other areas of modern science many years ago. In 1996 Pope John Paul II declared that "fresh knowledge leads to the recognition of the theory of evolution as more than just a hypothesis."[70] Along this line, a conference was recently held in Berkeley, California, entitled "Science and the Spiritual Quest." Numerous leading scientists, mostly with Catholic or mainline Protestant affiliations, participated in the meeting. Many expressed deep awe and wonder at the majesty of the universe, which is now known to be much vaster and more exotic than ever before imagined, and the beauty and elegance of the natural laws that govern it. Several of these scientists mentioned interesting new avenues where religion and modern science can accommodate and even reinforce each other.[71]

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67. Gary J. Bergera and Ronald Priddis, *Brigham Young University: A House of Faith* (Salt Lake City: Signature Books, 1985), 131-71.

68. "Evolution and the Origin of Man," packet of information approved by BYU Board of Trustees, June 1992, compiled by William Evenson, available at http://www.frii.com/~allsop/eyring-l/faq/evolution/trustees1992.html.

69. Talmage, *Can Science Be Faith-Promoting?*; Trent D. Stephens and D. Jeffrey Meldrum, *Evolution and Mormonism: A Quest for Understanding* (Salt Lake City: Signature Books, 2001).

70. Pennock, *The Tower of Babel*, 39.

71. Sharon Begley and Marian Westley, "Science Finds God," *Newsweek*, July 20, 1998, 46, available at http://www.washingtonpost.com/wp-srv/newsweek/science_of_god/scienceofgod.htm.

In tandem with these developments, numerous books have recently appeared which intelligently and sensitively explore these issues.[72] Physicist Paul Davies describes some remarkable features of our universe, such as its finely tuned physical parameters, and describes the wonder of advanced life on earth, which may be unique in a fairly large region surrounding the solar system.[73] Biologist Kenneth Miller asserts that one can be a serious scientist and a Christian believer, not because evolution is wrong, but because modern science (notably quantum mechanics and chaos theory) has destroyed the traditional notion of a deterministic, clockwork universe, thus allowing the hand of God in the ongoing process of creation.[74] Protestant theologian John Haught points out that in demanding a literal reading of Genesis, and in laying the truth of the Christian religion on the question of whether the Genesis text is scientifically correct, creationists are in effect ratifying the very philosophy (scientific materialism) that they most detest.[75] Haught also observes,

> If God were a magician or a dictator, then we might expect the universe to be finished all at once and remain eternally unchanged. If God insisted on being in total control of things, we might not expect the weird organisms of the Cambrian explosion, the later dinosaurs and reptiles, or the many other wild creatures that seem so exotic to us. We would want our divine magician to build the world along the lines of a narrowly human sense of clean perfection.
>
> But what a pallid and impoverished world that would be. It would lack all the drama, diversity, adventure, and intense beauty that evolution has in fact produced. A world of human design might have a listless harmony to it, and it might be a world devoid of pain and struggle, but it would have none of the novelty, contrast, danger, upheaval, and grandeur that evolution has brought about over billions of years.
>
> Fortunately, the God of our religion is not a magician but a creator. And we think this God is much more interested in promoting freedom and the adventure of evolution than in preserving the status quo.[76]

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72. Ian G. Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco: HarperSanFrancisco, 1997); Paul Davies, *The Accidental Universe* (London: Cambridge University Press, 1982); Davies, *The Fifth Miracle*; Stephen Jay Gould, *Rocks of Ages: Science and Religion in the Fullness of Life* (N.Y.: Ballantine Publishing Group, 1999); John F. Haught, *God after Darwin: A Theology of Evolution* (Boulder, Co.: Westview Press, 2000); John F. Haught, *Science and Religion: From Conflict to Conversation* (N.Y.: Paulist Press, 1995); Miller, *Finding Darwin's God*; John Polkinghorne, *Belief in God in an Age of Science* (New Haven: Yale University Press, 1998); Michael Ruse, *Can a Darwinian Be a Christian? The Relationship between Science and Religion* (London: Cambridge University Press, 2000).

73. Davies , *The Accidental Universe*; Davies, *The Fifth Miracle*.

74. Miller, *Finding Darwin's God*, 17.

75. Haught, *Science and Religion*, 52; Haught, *God after Darwin*, 31.

76. Haught, *Science and Religion*, 62.

It is significant that none of these books are written by creationists of either the YEC school or the IDC school. Instead, they are written by reputable scientists and theologians, mostly with Catholic or mainline Protestant affiliations, who seek an intellectually honest harmony between modern science and religion.

Conclusion

In summary, "scientific creationism" (as defined in the introduction) is not legitimate peer-reviewed science. It does not deserve to be presented on a par with conventional science in public schools. Instead, creationism is thinly disguised Biblical literalism.[77] And the new creationism is, for the most part, merely the old creationism in "designer clothes."[78]

From a theological perspective, creationism leads to the distasteful notion of God as a great Deceiver, who has planted evidence throughout the earth and the universe to mislead diligent seekers of truth. Further, either form of creationism contrasts sharply with fundamental LDS beliefs, which teach of harmony between science and religion, and which describe a rational, comprehensible God, who works within, rather than beyond the realm of natural law.

Creationist arguments in many cases represent new instances of the "God of the gaps" approach to theology—the philosophy that God can be found in the gaps of what currently remains unexplained in science. Those who have adopted this approach over the centuries have invariably been disappointed as scientific knowledge fills more of the remaining gaps. Many religious believers have also found that seeking "proofs" for the existence of God (scientific or otherwise) is an ineffective and often counter-productive route to faith. Jesus of Nazareth frequently commented on the dangers of seeking "signs" of this sort.[79]

Creationists create a false dichotomy: One must either accept their particular form of creationism or else reject faith in God. Yet many leading scientists with religious convictions, both LDS and non-LDS, have accommodated the findings of modern science without abandoning their basic religious beliefs. There is ample room within the scope of modern scientific knowledge for believing in an intelligent God who governs the marvelous ongoing process of creation.

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77. Overton, "McLean vs. Arkansas."
78. Pennock, *Tower of Babel*, 275.
79. Matt. 12:39, 16:4; Mark 8:12; Luke 11:29.