

AN ENGINEER TAKES A LOOK AT THE EVOLUTION DEBATE

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by

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Introduction

February 12, 2009, marked the 200th anniversary of Charles Darwin's birth. This and the occasion of the 150th anniversary of his book, *The Origin of Species*, inspired a spate of articles and books hailing the triumph of the theory of evolution. However, the debate between evolutionists and creationists is far from over, according to Kenneth Miller's 2008 book, *Only a Theory: Evolution and the Battle for America's Soul*. The complex issues of this debate are fertile ground for analysis, not only by scientists but by philosophers, theologians, and even an engineer. This paper will begin with an historical vignette of two early evolution debaters, Charles Darwin and Charles Hodge. A summary of scientific evidence for evolution will then be presented, followed by highlights of the contemporary debate. The paper will conclude with some personal reflections on the battle and recommendations for creationists who are considering entering the debate.

Two Early Opponents in the Evolution Debate

Looking back to the evolution debate in the 1870's, one is struck by the contemporary relevance of the words of Charles Darwin, the naturalist from England, and his contemporary opponent, Charles Hodge, the theologian from Princeton. According to Darwin, variation plus natural selection plus time results in descent with modification. In today's terms, mutation plus differential survival of the fittest plus time results in evolution. Darwin assumed that natural adaptive processes are sufficient to explain all the diversity and complexity of life from "one primordial form."¹ This concept is commonly

¹Charles Darwin, *The Origin of Species*, Sixth edition (London: Murray, 1871), 425.

represented in the image of a “Tree of Life” arising from a common root. At one level, Darwin’s theory of evolution may be understood from his words: “my deity ‘Natural Selection.’”² Darwin basically said that God might have started life, but Natural Selection took over from there.³

Charles Hodge’s response, in brief, was: “What is Darwinism? It is Atheism.”⁴ He said that Darwin “ascribes to blind, unintelligent causes the wonders of purpose and design which the world everywhere exhibits. . . .”⁵ Furthermore, Hodge claimed that in Darwin’s theory, “teleology, and therefore, mind, or God is expressly banished from the world.”⁶ With respect to science, Hodge said: “No sound minded man disputes any scientific fact. [However,] human explanations are not only without authority, but they are very mutable.”⁷ According to Hodge, “Darwin admits that contrivances in nature may be accounted for by assuming that they are due to design on the part of God. But, he [Darwin] says, that would not be science.”⁸ The positions of these early debaters should be kept in mind as one looks at the modern debate surrounding evolution today.

The Triumph of the Theory of Evolution

According to current scientific literature as well as popular publications, the theory of evolution has become accepted as fact. Jerry Coyne’s 2009 book, *Why*

²Norman Geisler and J. Kerby Anderson, *Origin Science: A Proposal for the Creation-Evolution Controversy* (Grand Rapids: Baker Book House, 1987), 84.

³Darwin’s beliefs about God have been interpreted variously. It is difficult to know whether he actually believed that God intervened to cause the beginning of life. See Gertrude Himmelfarb, *Darwin and the Darwinian Revolution* (Garden City, NY: Doubleday Anchor Books, 1959), 361-370.

⁴Charles Hodge. *What is Darwinism?* (New York: Scribner, Armstrong, and Company, 1874), 177.

⁵Charles Hodge, *Systematic Theology*, Vol. 2 (Grand Rapids: Eerdmans, 1940), 30.

⁶Charles Hodge, *ibid.*, 15–23. Teleology is concerned with purpose and destiny.

⁷Hodge, *What is Darwinism*, 131–32.

⁸*Ibid.*, 128.

Evolution is True, is meant to remove any lingering doubts about the “triumph” of this theory. A brief summary of the evidence supporting the theory is presented here.

Plenty of Time for Evolution

The first claim of evolutionists is that there has been plenty of time since life began to explain the diversity and complexity of life based on Darwin’s theory. Indeed, multiple methods of radiometric dating have been applied to various rock samples showing what appear to be indications of early life. For example, one set of rocks featuring stromatolite carbon deposits characteristically associated with *cyanobacteria* has been dated by the Uranium/Lead ($^{238}\text{U}/^{206}\text{Pb}$) method to be 3.5 billion years old.⁹ Another set of rocks embedded with stable carbon isotopes typical of living sources such as photosynthetic plankton have been dated to 3.7 billion years ago using the Samarium-Neodymium (Sm-Nd) method.¹⁰

The Evidence for Mechanisms of Change

The second claim of evolutionists is that genetic mutations have been shown to provide the mechanisms of change required for natural selection to produce all the diversity and complexity of life. As Ken Miller writes, mutations provide the “rich raw material of natural selection.”¹¹ Among the many types of mutations are simple nucleotide substitutions and transversions, gene duplications, insertions and deletions of

⁹Frances Westall, “Geochemistry: Life on an Anaerobic Planet,” in *Science*, 23 January, 2009, 471-472. See also, J. William Schopf, “Microfossils of the Early Archean Apex Chert: New Evidence of the Antiquity of Life, in *Science*, 30 April, 1993, 641.

¹⁰Minik T. Rosing, “ ^{13}C -Depleted Carbon Microparticles in >3700-Ma Sea-Floor Sedimentary Rocks from West Greenland,” in *Science*, January 29, 1999, Vol. 283, 674-676. The issues related to index fossils and strata dating are beyond the scope of this paper. However, there are multiple independent evidences for an old universe and an old earth, including ice core samples from Antarctica.

¹¹Kenneth Miller, *Only a Theory: Evolution and the Battle for the American Soul* (New York: Viking, 2008), 124.

large regions of chromosomes, inversions and fusions of chromosomes, and even duplication of entire genomes!¹²

Before looking at details of the kinds of change resulting from mutations, it is important to define macroevolution and microevolution. Macroevolution (or “super-macroevolution,” as some evolutionists call it) applies to major changes in morphology or function, such as the transition from fish to amphibians or the change of gills to lungs.¹³ Microevolution, covers lesser (adaptive) changes, such as bacteria acquiring resistance to antibiotics. Another example is bacteria that developed an enzyme to metabolize the byproducts of nylon production.¹⁴ In both cases bacteria acquired new abilities in response to changes in their environment. According to evolutionists, many small steps of microevolution result in macroevolution. Macroevolution is the major area of dispute.

A key belief of evolutionists is that all the diversity of life is caused by mutations. In his book, *The Making of the Fittest*, Sean Carroll demonstrates this idea by telling how mutations in “paintbrush genes” produce many different patterns of color in fruit fly wings. Carroll explains that these genes not only control wing spots, but also other body

¹²Sean Carroll believes that large-scale genome duplications explain the larger number of vertebrate tool-kit genes (*The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution* [New York: Norton, 2006], 203). A more cautious article published in 2005 states that conclusions on this topic remain unresolved. See Paramvir Dehal and Jeffrey L. Boore, “Two Rounds of Whole Genome Duplication in the Ancestral Vertebrate,” Public Library of Science, <http://biology.plosjournals.org/perlserv/?request=get-document&doi=10.1371%2Fjournal.pbio.0030314&ct=1> (accessed February 13, 2009).

¹³Mark Isaak, *The Counter-Creationism Handbook* (Berkeley: University of California Press, 2007), 90. Evolutionists say that macroevolution refers to changes at or above the species level; hence, different definitions of the term ‘macroevolution’ can cause confusion in the evolution debate. Evolutionists define macroevolution as any change that results in reproductive isolation. Such changes have been observed in nature to be caused as a result of geographic isolation for long periods of time.

¹⁴Miller, 80-81. Another example of microevolution is found in cultures which raise cattle. Human populations exposed to milk beyond infancy have developed an alternate form of the gene that produces the lactase enzyme. Such populations can digest the lactose in milk into adulthood, whereas others cannot.

parts in a multistep series of changes.¹⁵ This example suggests that small changes in genes contribute to diversity. This example also appears to refute Michael Behe's argument against multistep sequences of mutations in evolutionary processes.¹⁶

Evolutionists also provide evidence that increased *complexity* can result from gene duplication. An example is the development of trichromatic color vision in primates.¹⁷ In this case an existing opsin gene appears to have been duplicated. As a result of the gene duplication, the proteins in the retina of the eye produced by the original gene and its copy are sensitive to different wavelengths. According to evolutionists this mutation allowed the ancestors of Old World primates and humans to better discriminate between different hues of green, giving them a selective advantage.¹⁸ This example may raise questions about irreducible complexity.¹⁹

Evolutionists further claim that major changes in body formation can be explained by mutations of regulatory genes. Regulatory genes switch "coded" portions of other genes on and off, as well as control the level of gene expression.²⁰ For example, regulatory genes control the embryonic development of animals, such as differentiating heart tissue from brain tissue. Animals share a common set of regulatory genes called

¹⁵Carroll, 208.

¹⁶Behe, however, denies that such examples refute his concept of irreducible complexity. For example, see his blog post, http://www.amazon.com/gp/blog/A3DGRQ0IO7KYQ2/ref=cm_blog_blog (accessed February 17, 2009).

¹⁷Kanwaljit S. Dulai, Miranda von Dornum, John D. Mollon, and David M. Hunt, "The Evolution of Trichromatic Color Vision by Opsin Gene Duplication in New World and Old World Primates," in *Genome Research*, 1999 9:629-38.

¹⁸Ibid.

¹⁹Michael Behe apparently believes that the original genome contained all the genes necessary for later "expression" of complexity as required by individual species. Carroll disputes that idea based on the fact that non-coded genes are susceptible to mutation. See "God as Genetic Engineer," Sean Carroll's review of Behe's *The Edge of Evolution: The Search for the Limits of Darwinism* (New York: Free Press, 2007), in *Science* 8 June 2007: Vol. 316. no. 5830, pp. 1427-1428.

²⁰Fazale Rana, *The Cell's Design: How Chemistry Reveals the Creator's Artistry* (Grand Rapids: BakerBooks, 2008), 13-136.

“hox” or homeobox genes which scientists liken to “tool-kits” for body formation. Miller claims that these gene tool-kits explain the parallel evolution of complex structures such as different animal’s eyes and the limbs of land-dwelling animals.²¹

To illustrate the function of “hox” genes, Sean Carroll tells how changes in the *Pitx1* gene in shallow, fresh-water, stickleback fish gave them shorter spines and smaller pelvic fins compared to marine sticklebacks. According to Carroll, this demonstrates how small changes in a gene tool-kit might explain the evolutionary transition from fish to amphibians.²² Indeed, this is how he interprets novel features observed in the fossils of *Tiktaalik roseae*, an ancient shallow-water fish. Unlike most other fish, *Tiktaalik* had a flat head, a neck, and almost limb-like pectoral fins.²³ Because these features are suggestive of amphibian traits, *Tiktaalik* is said to provide an example of the transition from fish to amphibians. Hence, according to evolutionists, changes in regulatory genes are a major key to macroevolution.

The Evidence from Transitional Fossils

If animals evolved from fish to amphibians to reptiles to birds, and so on, one would expect to find fossils showing these transitions. Scientists say they are able to validate the theory of evolution with an impressive array of such transitional fossils. *Archaeopteryx* is the premier example of a proposed transitional fossil from dinosaurs (therapods) to birds. Its large feathers and opposable toes are said to anticipate modern birds, whose ancestors probably acquired feathers first as insulation.²⁴ Carroll suggests

²¹Miller, 150. See also, Laelaps: “Convergence or Parallel Evolution.” <http://laelaps.wordpress.com/2007/09/06/convergence-or-parallel-evolution/> (accessed January 31, 2009).

²²Carroll, 203-207.

²³ Neil Shubin, Cliff Tabin and Sean Carroll, “Deep homology and the origins of evolutionary novelty,” in *Nature*, 12 February 2009, 818-823.

²⁴Other than these two features, *Archaeopteryx* appears to have been typical of therapod dinosaurs. Scientists believe that it could not fly.

that wings were “invented” as a result of mutations of the regulatory genes that controlled the forelimbs of these theropods.²⁵

The DNA Evidence for Common Ancestry

Finally, evolutionists point to the striking DNA similarities between humans, chimpanzees, gorillas, and orangutans as the crowning example of evolution and common ancestry. The most famous example of the DNA similarities is human chromosome 2, which appears to be a fusion of two chimpanzee chromosomes. Comparative studies of the DNA of humans and chimps have shown a range of similarity from 86.7% to 98.7%.²⁶ Perhaps more significantly, DNA studies of humans and apes have found common “broken genes.” One such example is the defect in the gene on human chromosome 8 that is responsible for an enzyme used to synthesize Vitamin C in animals other than primates.²⁷ Such genetic similarities between humans, chimps, gorillas, and orangutans, have led evolutionists to conclude that they all share a common primate ancestor. Genomic research, however, is still in its infancy.²⁸

²⁵Miller, quoting Sean Carroll, 130. See also Jerry Coyne, *Why Evolution is True*, (New York: Viking, 2009), 46-47, 59. Coyne assumes that theropods survived the extinction of all other dinosaurs, and that they somehow survived over a long period of time and gained the ability to fly, after which those who could fly the farthest had a selective advantage.

²⁶By comparing single nucleotide polymorphisms (SNPs) in humans and chimp DNA, the two genomes appear to differ by only 1.3%. Other studies counting insertions and deletions (indels) as well as SNPs found differences of 13.3%. Similarly, a study of mitochondrial DNA differences gave a result of 8.9%. See Fazale Rana and Hugh Ross, *Who was Adam? A Creation Model Approach to the Origin of Man* (Colorado Springs: NavPress, 2005), 213-215. Rana and Ross observe that humans and daffodils share 35% genetic similarity (220). There are many unknowns about genomic similarities and differences.

²⁷Miller, 97. One possible explanation that Miller does not consider for shared broken genes is that they might represent common genetic scars from a disease that infected both humans and apes. Apes make excellent medical models for disease research because they closely mimic human responses to diseases.

²⁸Genomics research is finding significance in “junk DNA” and other features of the human genome that were not taken into account in previous DNA studies. DNA statistics do not tell the whole story. See Michael Seringhaus and Mark Gerstein, “Genomics Confounds Gene Classification,” in *American Scientist*, Nov/Dec 2008, Vol. 96, 466-473.

The Contemporary Debate

Turning to the contemporary debate, Ken Miller's latest book, *Only a Theory*, argues that in spite of the overwhelming evidence supporting evolution, it is at the center of a battle for America's soul. He even likens this battle to a Civil War between scientists and creationists in our country. However, since some scientists are creationists, creationists and evolutionists would be a more accurate description of the two sides. The creationists include the Intelligent Design movement, Young Earth Creationists, Old Earth Creationists, Progressive Creationists, Evolutionary Creationists, and others.²⁹ The evolutionists include atheists, naturalists, deists, theistic evolutionists, and others. Creationists appeal to God's special revelation in the Bible; evolutionists appeal to evidence from Nature (consulting, as it were, "genetic scripture").³⁰ Since God is the author of both of these "books," ultimately they cannot contradict each other.

Considering the combatants in this battle for America's soul, note that the creation side is theologically united, but hermeneutically diverse. On the other hand, the evolution side is very diverse theologically. What unites these diverse evolutionists? For one thing, they all agree that there is nothing to debate. Science has spoken!

According to evolutionary geneticist Richard Lewontin: "Our willingness to accept scientific claims that are against common sense is the key to an understanding of the real struggle between science and the supernatural. . . . It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our *a priori* adherence to

²⁹There seems to be a fine line between Evolutionary Creationists and Theistic Evolutionists, the latter emphasizing the sufficiency of natural processes from either an atheistic or deistic position, and the former emphasizing that God created all things through natural processes.

³⁰Matt Ridley, "Modern Darwins," in *National Geographic*, Vol. 215, No. 2, February 2009, 59.

material causes. . . . Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door.”³¹

Hence, what unites evolutionists is an unwavering commitment to a belief that nature is autonomous and that everything about life can be explained by biochemistry and natural processes. Evolutionists are united by a materialistic, and therefore, as Hodge said, an atheistic philosophy.

The Theological and Philosophical Controversy

If evolutionists are united by a materialistic, atheistic philosophy, what about theistic evolutionists? How do scientists who believe in God accept such materialistic explanations for life? Ken Miller, a Roman Catholic, believes that faith and the theory of evolution are compatible. Indeed the Bible seems to affirm the role of nature in creation. For example, according to Genesis, God said, “Let the earth sprout vegetation . . . after their kind,” and “Let the earth bring forth living creatures after their kind” (Gen. 1:11, 24). If the Bible says that the earth brought forth plants and animals, what is the problem with evolution?

On the other hand, creationists disagree with Miller. They identify a number of major areas of conflict between faith and the theory of evolution. Five of these areas are listed here:

First of all, it is fundamentally antithetical to the teaching of scripture that nature is autonomous, as evolutionists portray it. Hebrews and Colossians affirm that God actively sustains all of His creation: “He upholds all things by the word of His power”

³¹Richard Lewontin, “Billions and Billions of Demons,” Book Review of *The Demon-Haunted World: Science as a Candle in the Dark*, by Carl Sagan, in *New York Times*, January 9, 1997.

(Heb. 1:3) and “in Him all things hold together” (Col. 1:17). What Hodge called the “blind, unintelligent causes” of nature could not autonomously cause all the diversity and complexity of life: according to the Bible, nature is contingent on the Creator.

Secondly, evolutionists insist on the absence of a primary cause to explain what Hodge described as “the wonders of purpose and design which the world everywhere exhibits. . . .” This position directly contradicts the teaching of Scripture that “All things were made through Him” (John 1:3). The account of creation in Genesis furthermore attributes the appearance of each major form of life to the verbal command of God.

Thirdly, the evolutionist view that humans are basically the same as chimpanzees except for abilities attributed to a larger brain is irreconcilable with the explicit teaching of Scripture: humans have been uniquely created in the image of God. Of all the plants and animals Genesis says, “after their kind,” but of humans it says, “in the image of God He created him; male and female He created them” (Gen. 1:27; cf. Gen. 5:1-2; Gen. 9:6).

Fourthly, evolutionists typically reject the teaching of scripture that the “brokenness” of life is a result of the Fall (cf. Gen. 3:14-19). They insist, instead, that the imperfections observed in life and in DNA sequences are merely the result of “blind, unintelligent” nature, which Miller describes as a “tinkerer,” building life with imperfect raw materials.³² This autonomous view of nature conflicts with Scriptural teaching.

Finally, as Hodge astutely observed, evolutionists expressly banish “teleology” from the world. In contrast, Jesus says, “For God so loved the world that He gave His only begotten Son that whosoever believes in Him should not perish but have everlasting life” (John 3:16). God’s Word affirms that the purpose of life is wrapped up in personal

³²Miller, 130. Strangely, Miller, a Roman Catholic, taunts creationists with the thought: what kind of intelligent designer would create a genome “riddled with useless information, mistakes, and broken genes?” (97).

relationship with the Creator, transcending this life. In contrast, the purpose of a life that is only the cumulative result of “blind, unintelligent” causes can be no greater than its causes. Yet God has built a yearning for purpose into humans, requiring evolutionists to look beyond science for answers to questions of teleology.

The Scientific Controversy

In March 2009, the Texas Board of Education held the last of a series of public hearings on guidelines for the science curriculum in the state for the next ten years. One woman emphatically argued that an examination of the “strengths and weaknesses” of the theory of evolution makes no sense, because there are no weaknesses. On cross-examination from a member of the board she held her ground. Was she right? Are there are no weaknesses in the theory of evolution? Is theology the only driving force for what Ken Miller calls the “battle for America’s soul?” As will be shown, there are, indeed, important debates about evolution among scientists.

How Life on Earth Began

The first area of debate among scientists is the origins of life. Technically, evolution does not address origins; however, evolutionary biologists have ventured various theories about it. Darwin thought that life could have started from a spark in a “warm little pond.” Since Urey and Miller produced the first amino acids fifty years ago in a laboratory, scientists have discovered how inadequate amino acids, and even proteins, are without all the other complex components of life. How, then, do scientists today explain the origins of life? Alternate theories include an early RNA world, life springing from marine hydro-vents, “genetic take-overs” of clay templates by nucleic

acids, and even the importation of life to earth from meteorites! There is no consensus among scientists about the origins of life on earth; yet, the latest books on evolution present these theories as the best alternatives available.³³

Rethinking the Tree of Life

Since Darwin's day, evolutionists assumed that the whole "Tree of Life" grew from "one primordial form." On the 200th anniversary of Darwin's birth, however, Eugene Koonin's article entitled "Darwinian evolution in the light of genomics," raised significant questions about the Tree of Life. He writes: "The existence of a 'species tree' for the entire history of cellular life, is falsified by the results of comparative genomics," and "There are major differences in the genome layouts between different lines of life."³⁴ What Carl Woese, a famous researcher on early life, called the *doctrinal status* of common descent appears to be unravelling.³⁵ Koonin even suggests the possibility that the "Tree of Life" concept may yet be abandoned for a "Forest of Life" image. This sounds remarkably similar to the "Orchard of Life" image proposed by the young earth organization, "Answers in Genesis."³⁶ In the words of Martin Poenie, Professor of Biology at the University of Texas at Austin, "There are a world of competing ideas out there" and "there is very little consensus" on early life.³⁷

³³Donald Prothero, *Evolution: What the Fossils Say and Why it Matters* (New York: Columbia University Press, 2007),148-153.

³⁴Eugene V. Koonin, "Darwinian evolution in the light of genomics," in *Nucleic Acids Research*, February 12, 2009, <http://nar.oxfordjournals.org/cgi/content/full/gkp089v1> (accessed February 20, 2009).

³⁵Carl Woese, "A New Biology for a New Century," in *Microbiology and Molecular Biology Reviews*, June 2004, Vol. 68, No. 2, 179. Woese also argues that the "tree of life" representation, although technically inaccurate based on his theory of horizontal gene transfer, is nevertheless a useful graphical representation of the evolution of all life from a common ancestor (Ibid.).

³⁶Charles Todd Wood, "Two of Every Kind: The Animals on Noah's Ark," Answersingenesis.com, <http://www.answersingenesis.org/articles/am/v2/n2/two-of-every-kind> (accessed March 14, 2009).

³⁷Private correspondence, April 3, 2009.

The “Cambrian Explosion:” an Exception to Gradual Change

According to Darwin, “natural selection acts only by taking advantage of slight successive variations; she can never take a great and sudden leap, but must advance by short and sure, though slow steps.”³⁸ This appears to be consistent with what scientists say about the first 3 billion years of life, during which three primitive domains of life emerged: archaea, bacteria, and eukarya. However, at about 550 million years ago (550 Ma), an “explosion” of new life forms appeared in the geologic record.³⁹ Both trilobites and dinosaurs appear suddenly in the fossil record. Reflecting on this “Cambrian Explosion” and the fossil record in general, Steven Jay Gould said: “The oldest truth of paleontology proclaimed that the vast majority of species appear fully formed in the fossil record and do not change substantially during the long period of their later existence.”⁴⁰ This observation led Gould and Eldredge to propose that “natural selection could fine-tune organisms during periods of stasis but that another mechanism had to account for punctuated change.”⁴¹

Although evolutionists are quick to point out that punctuated equilibria is an argument from silence, Gould’s statement has survived.⁴² Indeed, the February 6, 2009, issue of the premier journal, *Science*, describes two evolutionary models: the Red Queen

³⁸Darwin, 156.

³⁹Scientists are quick to point out that this “explosion” took roughly 30 million years, plenty of time for evolution to occur. Note, however, the “gaps” in the fossil record are undeniable. Also, one might question whether the rate of the “molecular clock” that plodded along for 3 billion years without producing *any* noticeable evolution suddenly changed around the time of the Cambrian explosion.

⁴⁰Donald Prothero, 81.

⁴¹David N. Resnick and Robert E. Ricklefs, “Darwin’s Bridge Between microevolution and macroevolution,” in *Nature*, 12 February, 2009, 838.

⁴²It has been said that the absence of dinosaur ancestors in the fossil record represents a “systematic” absence. It is, indeed, remarkable that the rich fossil record of dinosaurs is so completely void of signs of their ancestors.

and the Court Jester.⁴³ The Red Queen model follows Darwin's emphasis on slow competitive processes, characterized by the Red Queen's statement in *Alice Through the Looking-Glass*: "it takes all the running you can do to keep in the same place." In contrast, the Court Jester model emphasizes Gould's idea of rare leaps of evolution in response to unpredictable changes in the environment.⁴⁴ Biologists have tended to align with the Red Queen model and geologists with the Court Jester model. Evolutionists today are looking for ways not only to harmonize natural selection and punctuated equilibria, but also, as will soon be demonstrated, to fill in other gaps in their theories.

Evolutionary Convergence: Mystery or Magical Fairy Tale?

Evolutionary convergence is one of the more mysterious concepts in the current scientific literature. Regarding this concept, Miller says that "adaptive spaces" and niches are built into the natural selection process.⁴⁵ Evolutionary convergence attempts to explain similarities between evolutionarily distant species, such as the wings of insects, birds, and bats. How this convergence works, however, is unclear. Scientists talk about unidentified "seeds" of future forms present in earlier forms, and mysterious factors that limit the forms of life, causing the same solutions to keep arising.⁴⁶ If, as Miller says, [Intelligent] "Design" is a "magical fairy tale," what is this?⁴⁷

Questionable Explanations of Scientific Facts

⁴³The names of the models and the following description come from Michael J. Benton, "The Red Queen and the Court Jester: Species Diversity and the Role of Biotic and Abiotic Factors Through Time," *Science*, 6 February, 2009, 728-32.

⁴⁴It is not obvious that leaps of evolution are caused by unpredictable changes in the environment. Scientists speak of two major extinctions in earth's history: the Permian extinction (ca. 250 Ma) and the Cretaceous extinction (ca. 65 Ma). In both cases, fossils indicate both the loss of many species and a greatly delayed recovery, not a quick, sudden burst of new life forms.

⁴⁵Miller, 147.

⁴⁶Martin Poenie, personal correspondence, April 13, 2009.

⁴⁷Miller, 110.

Charles Hodge said it well: “Must we also admit their explanations and inferences? . . . the facts are from God, the explanation from men. . . .”⁴⁸ Indeed, human scientific explanations are fallible and not always persuasive. For example, *Tiktaalik*, a so-called transitional fossil between fish and amphibians, looks a lot like modern flathead fish. Evolutionists focus on *transitional features* because the fossil record lacks *transitional forms of whole animals*.

Sean Carroll’s assertion that regulatory gene “tool-kits” or “hox” genes are able to “invent” wings is another questionable explanation. The available empirical evidence is that “hox” gene mutations are limited to microevolutionary changes such as shorter spines in stickleback fish and misplaced antennae on fruit flies. All “hox” genes really do is switch on or off and control the level of expression of other genes. An engineer recognizes this as the kind of function provided by finite state-machines which control electrical appliances, such as a dishwasher.⁴⁹ Such state-machines must be pre-programmed to control other electrical circuits, and their function is very limited. Furthermore, what turns off “purifying selection” (which disables significant changes) during the “invention” of new body parts?⁵⁰ And finally, where did these “hox” genes come from? They do not even exist in the presumed ancestral protozoa or in plants.⁵¹ The

⁴⁸Hodge, *What is Darwinism?*, 132.

⁴⁹In *The Cell’s Design*, Rana suggests some other engineering analogies to argue that life shows evidence of design. For example, a flagellum is a biological motor (85-89), DNA features parity-like codes (158-159), and Turing machines operate on DNA (164-165). Rana’s analysis of the historical rebuttal of Paley’s argument is insightful, arguing that the weakness of the watch analogy (non-living) is overcome by the examples of living “machines” such as those just mentioned.

⁵⁰Purifying selection includes an organism’s built-in defenses against cancer and other changes that might significantly impact an organism, including mutations of regulatory genes.

⁵¹Derek Lemons and William McGinnis, “Genomic Evolution of Hox Gene Clusters,” in *Science* 29 September 2006, 1918.

burden of proof is on evolutionists to validate their claims about macroevolution with something more than speculation about many successive steps of microevolution.

Evolutionary Theory in Transition

Finally, even scientists admit that the fundamental tenets of Darwinism are inadequate to explain the diversity and complexity of life. For example, an article recently published in the prestigious journal, *Nature*, states: “. . . *species and higher ranks in the taxonomic hierarchy are often separated by gaps without evidence of a transition between them,*” and “. . . *microevolution alone cannot explain macroevolution.*”⁵² It is interesting to note how much Charles Hodge’s prediction of the “mutable” character of human interpretations rings true at the 150th anniversary of *The Origin of Species*.

Consider also the following summary statements from Eugene Koonin’s February 2009 article in *Nucleic Acid Research*:

“The theoretical and empirical studies on the evolution of genomic complexity suggest that there is no trend for complexification in the history of life and that, *when complexity does substantially increase, this occurs not as an adaptation but as a consequence of weak purifying selection, . . . a telltale sign of evolutionary failure*. It appears that these findings are sufficient to put to rest the notion of evolutionary ‘progress’”⁵³

Koonin summarizes the recent findings of genomics as follows: “The insistence on adaptation being the primary mode of evolution . . . became deeply suspicious if not outright obsolete, making room for a new worldview that gives much *more prominence*

⁵²Resnick, et al., 837-841, emphasis added.

⁵³Koonin, emphasis added (13-14). Purifying selection is said to be natural selection’s way of eliminating deleterious mutations. It is strongly expressed in stable populations such as sharks, which scientists believe have not changed in millions of years.

to non-adaptive processes.”⁵⁴ Hence, evolutionists admit that their traditional theories do not account for the gaps in the complexities of life.

Creationists Responses

Having reviewed some of the strengths and weaknesses of evolutionary theory, let us now take a look at the responses of creationists.

Young Earth Creationists (YEC)

In the 1970’s young earth creationists, Duane Gish and Henry Morris went around to college campuses debating evolutionists, proclaiming: “The real issue is: how do you get from fish to Gish?!”⁵⁵ Their work continues through the Institute for Creation Research and books such as *Evolution: the Fossils Still Say No!* Ken Ham also has attracted a young earth following through the organization, “Answers in Genesis.” Young earth creationists accept Bishop Ussher’s literal interpretation of Genesis, believing that Adam was created in 4004 B.C. (assuming no gaps in the genealogies).⁵⁶

Origin Science

In 1987 Norman Geisler and J. Kerby Anderson proposed a philosophical approach to the question of origins in their book entitled, *Origin Science: A Proposal for the Creation-Evolution Controversy*. According to them, “origin” science is the best way to study “singularities” such as the origins of the universe and life. “Origin” science does this using forensic evidence and analogies, recognizing primary causes. On the other

⁵⁴Ibid., emphasis added. Non-adaptive processes include gene duplication. Koonin reports a “wave of massive duplication” at the emergence of eukaryotes (12).

⁵⁵Henry Morris founded the Institute for Creation Research, which is very active in the debate.

⁵⁶The genealogies in Scripture appear to be concerned more with lineage than chronology, as indicated by Matthew’s genealogy which neatly lists three groups of 14 generations. Likewise the genealogies in Gen. 5 and Gen. 11 record ten generations from Adam to Noah, and the same number from Noah to Abram. If one assumes no gaps in Gen. 11, Noah’s son Shem outlived 8 later generations.

hand, “operation” science is concerned only with secondary causes. Furthermore, it relegates teleology to the realms of theology and philosophy. Because the scientific community has not listened to Geisler and Anderson, evolutionists continue to ignore primary causes and they have no satisfactory answer for questions of teleology.

The Intelligent Design Movement

The Intelligent Design (ID) movement began in response to a 1987 United States Supreme Court ruling that creation science could not be taught alongside evolution.⁵⁷ Led by the Discovery Institute think tank, the ID movement argues that certain features of the universe and of living things cannot be explained by unintelligent processes, and are best explained by an intelligent cause. By avoiding references to God and the Bible, the ID movement has attempted to sidestep separation of church and state issues.

Irreducible complexity, championed by Michael Behe, is a cornerstone argument of the ID movement. According to this concept one should be able to recognize that an intelligent agent caused certain things without having to identify the designer.⁵⁸ William Dembski has promoted specified complexity and an “explanatory filter,” emphasizing patterns that suggest teleological intent behind complex living things.⁵⁹

The ID movement has produced a number of books touting its tenets since Philip Johnson’s 1993 book, *Darwin on Trial*. It also promised in the late 1990’s to publish 100 scientific articles in five years in order to gain academic credibility. One of the Discovery Institute’s most notable accomplishments has been to persuade more than 700 scientists

⁵⁷*Edwards v. Aguillard* in Louisiana.

⁵⁸Irreducible complexity argues that all the “irreducible” parts are required for the intended function, such as the bacterial flagellum. Removal of any of these parts disables the function.

⁵⁹See Dembski’s writings, beginning with *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge University Press, 1998).

to sign “A Scientific Dissent from Darwinism.”⁶⁰ The ID movement is also well known for its support of political action and public debates.⁶¹

A Testable Model for Creation

A fourth, and lesser known creation movement is led by Hugh Ross and his team of scientists at the organization, Reasons to Believe. Ross has boldly championed what he calls a “testable model for creation,” articulated in his latest book, *More than a Theory*. Unlike the ID movement, Ross does not try to hide the biblical basis for his model; and unlike Gish and Ham, he has adopted an old-earth interpretation of the Bible. Moreover, Ross correlates his interpretation of the Bible with the results of mainstream scientific research. In *Who was Adam*, for example, he and Fazale Rana appeal to the findings of human DNA studies, suggesting that the Genesis story of Noah perfectly matches the human “genetic bottleneck” recognized by evolutionists.⁶² This is just one of many examples in which Reasons to Believe harmonizes the interpretation of nature and the Bible. Reasons to Believe is also actively engaging evolutionists in public debates, such as one coming to the University of Texas on April 28, 2009.

Critiquing the Creationists

Where have creationists fallen short? First of all, they are a “house divided.” Jim Tour, the Chao Professor of Chemistry at Rice University and a signatory to “A Scientific Dissent from Darwinism,” offers some insightful thoughts about evolution on his

⁶⁰A Scientific Dissent from Darwinism, <http://www.dissentfromdarwin.org/> (accessed March 3, 2009). The text of this dissent reads: “We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged.”

⁶¹Examples of states that have attempted to support ID in science classes include: Alabama, Arkansas, California, Florida, Georgia, Illinois, Kansas, Louisiana, Minnesota, Pennsylvania, and Texas.

⁶²The account in Genesis says that eight humans survived the flood, including Noah’s three sons and four women descended from other families. Therefore, the oldest common female ancestor of all survivors of the flood was Eve, and the oldest common male ancestor was Noah.

website.⁶³ Regarding the age of the earth, Tour says it is unfair and unscientific to claim that radiometric dates determined from multiple sets of isotopes could be off by four to five orders of magnitude (100,000 times).⁶⁴ Tour also suggests it is unreasonable to say that “God made it look older than it really is.” He goes on to ask: “With what else is God deceiving us?” As a college professor, Tour warns parents that college students seek truth, and restricting them to a “select set of cloistered ‘scientific’ data” will eventually backfire.⁶⁵ From all indications, the intramural debate between young-earth creationists and old-earthers does not appear to be winning adherents from either side.⁶⁶ As a result, evolutionists ignore both.

Unfortunately, the ID movement also has received its own share of criticism. Its promise more than ten years ago to deliver 100 scientific publications has not materialized; and evolutionists are quick to point out that op-eds and position papers don’t count. Moreover, the concepts of Irreducible Complexity and Specified Complexity appear to be difficult to prove. The debates on the intricacies of these ideas in books and on blogs are beyond the abilities of most people to even evaluate. Based on recent

⁶³James M. Tour, “Layman’s Reflections on Evolution and Creation. An Insider’s View of the Academy,” James M. Tour Group, Rice University, http://www.jmtour.com/?page_id=27 (accessed March 15, 2009). Tour is also renowned nano-tech research scientist as well as inter-disciplinary Professor of Computer Science, Mechanical Engineering, and Materials Science at Rice.

⁶⁴Ibid. The disparities are from billions of years to thousands of years for rocks. Old-earthers view the “days” of Genesis 1 metaphorically. There was no sun for 3 “days.” The point of Genesis 1-2 is that God created all things and He rested, setting a pattern for human work and Sabbath rest. The principle, not the chronology, is important. The same principle is applied to the land: one year of rest in seven; and even property: restoration once in seven-sevens of years (jubilee). The objection against death prior to the Fall has been variously answered. For example, Romans 5:12 says “death spread to all *men*, because all sinned.” Scripture does not say that death spread to plants and animals because of sin. Furthermore, God did not have to tell Adam what death meant in Gen. 2 – 3.

⁶⁵Ibid. One should weigh all evidence and “hold fast to that which is good” (1 Thess. 5:21).

⁶⁶Young-earth creationist arguments against dating typically cite examples of inconsistencies that scientists have previously refuted, e.g., ⁴⁰Ar-⁴⁰K inaccuracies corrected by incorporating ³⁹Ar measurements and using isochrons. They also dismiss evidence from other sources, such as Antarctic ice core samples, containing evidence of annual cycles for hundreds of thousands of years. Their claims that cataclysmic events invalidate all dating results beyond 6,000 years make them appear to be “anti-science.”

exchanges between evolutionists and ID proponents, the debates on these concepts appear to be headed toward stalemates. Finally, the strategy of removing references to God and the Bible from the debate has not produced the intended results. In the 2005 court case, *Kitzmiller vs. Dover Area School Board*, the (conservative) judge ruled that the ID movement's goal is to teach a religious viewpoint, which is unconstitutional.

As a result of the ID movement failings, the divisions among creationists, and the perception that young earth creationists are anti-science, creationists have lost credibility in the public eye. Federal courts have consistently ruled against the teaching of alternatives to evolution. Furthermore, the scientific community currently has no respect for creation science organizations and no patience with creation proponents. Two signs displayed on the door of a biology faculty member at the University of Texas at Austin illustrate the feelings of many scientists: "Keep your theology off my biology!" and "Don't mess with evolution."

Reflections on the Battle

Finally, let us turn our attention from the debate to reflections on the battle. Fazale Rana models the kind of humility all participants should emulate. Avoiding the dogmatism found on both sides of the debate, Rana admits: "Often there simply isn't enough understanding to say for certain if evolutionary processes can or cannot generate specific biochemical characteristics."⁶⁷ Because of deeply held presuppositions by most of the participants, which, in turn, influence interpretations of God's two "books," this debate appears to be never-ending. Entering the evolution debate should not be taken lightly. Be prepared for misunderstanding, misrepresentation, inflated egos, and distrust

⁶⁷Fazale Rana, 20.

on both sides. A lot of study, an apologetic inclination, and a tough skin are required. Personal experience has shown this engineer that even engaging with scientists who are Christians can be very humbling and frustrating!

Creationist Pitfalls to Avoid

In addition to being prepared for the antagonistic responses expected in the evolution debate, one should also try to avoid the following common pitfalls.

- 1) Admit it when not qualified to make judgments about a topic. If unable to evaluate what the scientific literature says, defer to the experts.
- 2) Be cautious not to categorically deny the ability of natural processes to explain what scientists claim. Recall that God said, “Let the earth bring forth living creatures after their kind . . .” (Gen. 1:24).
- 3) Avoid “God of the gaps” arguments (asserting that God is the only explanation for something that may be refuted by future scientific discoveries).
- 4) Avoid using arguments based on the Second Law of Thermodynamics (life is not an isolated system, as may be argued for the universe).
- 5) Be cautious about “quote mining” (taking scientists’ quotes out of context).

Going Forward

Creationists should take heart in this seemingly intractable debate over evolution: ultimately, God’s “two books” are compatible. Here are a few constructive suggestions for those who want to participate in the debate:

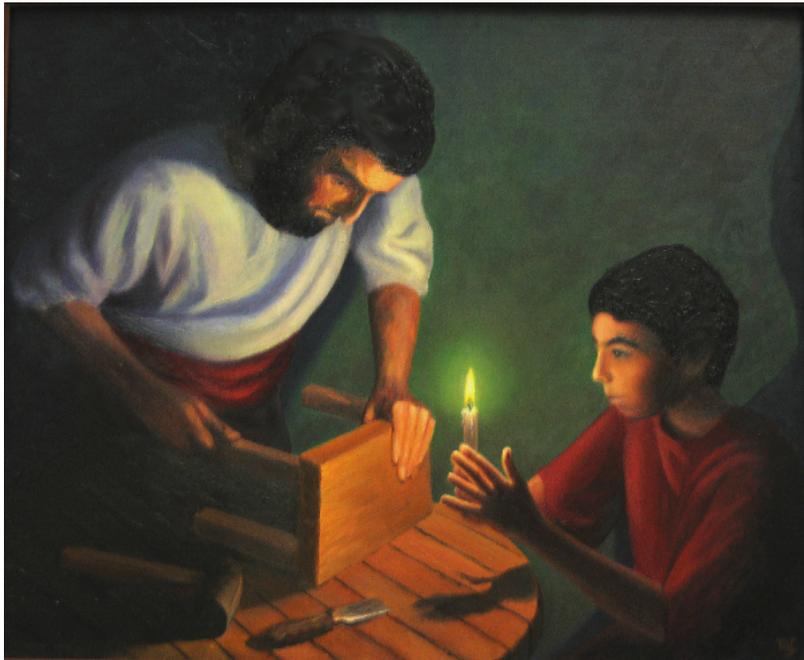
- Creationists should be better informed about science, particularly on hotly debated topics.
- Creationists who are scientists should be encouraged and supported in conducting research on testable models of creation.
- Creationists who are not scientists should participate in and support public forums that seek to affirm the compatibility of God’s “two books.”
- Creationists should engage in constructive dialog with theistic evolutionists in order to better understand their positions, and to challenge them about biblical truths that conflict with evolution.
- Creationists should pursue personal relationships with both college students and evolutionists, talking about the purpose of life, primary and secondary causes, and the contingency of nature. After all, life is much more than fossils and DNA. God loves His creation, and this fleeting life is not all there is.

Finally, “always be ready to make a defense to everyone who asks you to give an account for the hope that is in you, yet with gentleness and reverence; and keep a good conscience” (1 Pet. 3:15-16). Ken Miller asserts that “Evolution speaks directly to our conception of who we are, where we come from, and how we regard ourselves with respect to the rest of the living world.”⁶⁸ How should a creationist respond? Evolution alone cannot answer the deeper questions that humans have always yearned to understand: why are we alive and what is our ultimate destiny? To see the whole picture, one must turn to the Creator and learn what both of His “books” tell us.

In closing, please take a moment to meditate on the great mystery of our Creator’s relationship with His creation. He who was in the beginning, not made, of one substance

⁶⁸Miller, 193.

with the Father, was incarnate by the Holy Spirit and born of the Virgin Mary. He who is the light of the world came into the world to offer true life. The painting below depicts the boy Jesus with Joseph, who is making a footstool. The image of the footstool is intended to draw one's thoughts to teleological themes: "Heaven is My throne and earth is My footstool," and "Sit at My right hand until I make your enemies a footstool for your feet." He who made the world and everything in it, came to bring salvation to those who seek Him. Ultimately, He will sum up all things, and we who are called by His name will share the joy of His eternal kingdom with Him (cf. 1 Cor. 15:22-28).



"The Footstool" – by Mike Field, 2005

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