Intelligent Design

The Scientific Alternative to Evolution

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A little science estranges a man from God; a little more brings him back.

Francis Bacon (1561–1626)

Sooner or later everyone asks the question, "Where do we come from?" The answer carries profound, life-molding implications. Until this question is answered we cannot solve another fundamental question that is key to ethics, religion, and the meaning of life (if any): "Are we here for a purpose?"

There are two possible answers: the universe and life and its diversity—natural phenomena—are the product of 1) a combination of only natural laws and chance (the "naturalistic hypothesis)"; or 2) a combination of law, chance, and design—the activity of a mind or some form of intelligence that has the power to manipulate matter and energy (the "design hypothesis"). The latter produces purpose, the former does not.

The naturalistic hypothesis is supported by theories of chemical evolution (with respect to the origin of the universe and of life) and by Darwinian evolution (with respect to the origin of the diversity of life). The design hypothesis is supported by the purposeful characteristics of exceedingly complex natural systems that are frequently described as "fine tuned." Each hypothesis is densely laden with philosophical and religious baggage, and clear thinking is required in order to separate the

science from the philosophy, the evidence from the implications, and reality from imagination.

The authors are trained in scientific research and law.[1] In this article, we hope to convince the reader that a substantial scientific controversy exists about our origins, that the controversy cannot be resolved without objective consideration of intelligent design (ID) and its challenge to evolution, and that a resolution of the controversy is enormously important to our worldviews about science, religion, ethics, and morals. In discussing the issues, we make several propositions: 1) that the most important, defining characteristic of Darwinian evolution is that it is an unguided, unplanned, and purposeless process; 2) that ID is science and not religion; and 3) that there are profound religious, ethical, and moral implications associated with each origins theory.

This article begins with a comprehensive discussion of key terms and concepts. It then proceeds to a consideration of the detection of design, the evidence supporting both origins hypotheses, and finally it reflects on how ID impacts bioethics.

Terms of the Debate

Much confusion about evolution and ID stems from imprecise and elusive definitions of terms.

Origins Science

As used in this essay, origins science is the science that seeks to explain the origin (or causes) of the universe, of the earth, and of life and its diversity. Origins science is historical rather than strictly empirical in nature. Thus, it differs from experimental disciplines like chemistry and physics because experiments cannot be used to directly test its hypotheses. The historical nature of origins science is explained by Harvard Professor Ernst Mayr.

> For example, Darwin introduced historicity into science. Evolutionary biology, in contrast with physics and chemistry, is a historical science—the evolutionist attempts to explain events and processes that have already taken place. *Laws and experiments are inappropriate techniques for the explication of such events and processes*. Instead *one constructs a historical narrative*, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain.[2]

The historical-empirical distinction is critically important. Contrary to purely empirical sciences whose conclusions are held to rigorous objectivity by "laws and experiments," the explanations of a historian are held to no such standard or discipline.

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[2]Ernst Mayr, "*Darwin's Influence on Modern Thought,*" *Scientific American* 283.1 (July 2000): 80–82, emphasis added.

This allows the historian's explanations to be subjective, influenced not only by supportive data but also by imagination, philosophy, and religious (or nonreligious) views.

The second unique characteristic of origins science is that it addresses the same questions as do all religions, and thus unavoidably impacts religious belief. Any answer to the question, "Where do we come from?" is certain to offend someone.

Accordingly, the historical, subjective, and religious nature of origins science demands that it be conducted objectively and without philosophic or religious bias, and that all relevant evidence be properly evaluated regardless of its implications.

Evolution

In common parlance, evolution refers to things changing over time. Many things "evolve" in this sense: car designs, political systems, computer software, interpersonal relationships, etc. This definition is noncontroversial. Everyone agrees that things change. Even when applied to living systems, we note that "things change." A fertilized egg becomes a baby, a child, a teenager, and an adult. Dandelions change from a golden flower to a dusty ball of seeds, and caterpillars become butterflies. Even closer to home, we know that different breeds of dogs, cats, and livestock have been "created" by artificial selection via planned, selective breeding. Thus, evolution as change is accepted by all scientists. The question is not, has there been change, but what has *caused* the change?

Darwinian Evolution

It was "artificial" (i.e., intelligence-driven) selection that Charles Darwin had in mind when he coined his term "natural" selection[3] in his 1859 book *The Origin of Species*. Darwin argued that if intelligent agents could engender such radical changes in animal forms in a few years by planned breeding, then mindless processes could probably do the same thing if they had enough time, with environmental factors allowing the "most fit" members of a population to survive (and reproduce) better than the "less fit." Darwin knew well that life forms, body plans, and structures have changed over long periods of time. Fossils alone attest to the stunning variety of increasingly complex plants and animals no longer living. No doubt life has changed. But what *caused* the change? Darwin and his successors contend that an unguided, mindless natural process caused the changes, that law and chance alone (natural selection acting on random variation) are sufficient to explain all of life's diversity and life's origin.

The National Association of Biology Teachers in 1995 provided the following definition of evolution:

> The diversity of life on earth *is* the outcome of evolution: an unsupervised, impersonal, unpredictable, and natural process of temporal descent with genetic

[3]Selection is a term that implies the making of a choice, a decision. Synonyms include picking out, choosing, and preferring. A mindless process cannot "select" in this sense. A river does not choose to follow the path of least resistance; sodium and chloride ions do not choose to form a salt crystal; gasoline, oxygen, and a spark do not choose to explode; and a colander does not choose to retain noodles. The term "natural selection" is an oxymoron and its widespread use contributes to the pervasive confusion so characteristic of this topic.

> modification that is affected by natural selection, chance, historical contingencies, and changing environments.[4]

Thus, evolution is, by definition, a completely unguided and undirected process in which a mind plays no part. It is purposeless because only minds generate purpose.

The purposelessness of the process is made clear by those who advance the Darwinian theory:

> Darwin did two things: he showed that evolution was a fact contradicting scriptural legends of creation, and that its cause, natural selection, was automatic with no room for divine guidance or design.[5]

> Man is the result of a purposeless and natural process that did not have him in mind.[6]

> Darwin's immeasurably important contribution to science was to show how mechanistic causes could also explain all biological phenomena, despite their apparent evidence of design and purpose. By coupling undirected, purposeless variation to the blind, uncaring process of natural selection, Darwin made theological or spiritual explanations of the life processes superfluous.[7]

> Man has to understand that he is a mere accident.[8]

When biologists speak of "evolution," this is what they mean. Not just *change* but unguided, unintended, purposeless change uninfluenced by a higher intelligence. These statements make it clear that evolution excludes the intervention of any natural or supernatural mind. According to Darwinists, we are "occurrences" and not "designs."

The Neo-Darwinian Synthesis

Darwin proposed no mechanism for how changes in organisms either arose or were inherited by subsequent generations. Although Gregor Mendel discovered the fundamental principles of genetics during Darwin's lifetime, Mendel's work (published in 1866) was not widely known, and its significance was not appreciated until

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[4]Emphasis added. See Gene Stowe, "Don't Mix Theology with Science, Professers Urge," *South Bend Tribune*, February 20, 1998. The definition was published by the National Association of Biology teachers. Due to complaints, the reference to the process as being "unsupervised" was removed. See http://www.asa3.org/archive/evolution/199610/0058.html (July 11, 2003) and http://www.nabt.org/sub/position_statements/evolution.asp. (June 11, 2003). Notwithstanding, the fundamental tenet of evolutionary biology remains intact: Evolution is an unguided and unsupervised process.

[5]*The New Encyclopedia Britannica*, 15th ed., 1973–1974.

[6]George Gaylord Simpson, *The Meaning of Evolution* (New Haven, CT: Yale University Press, 1967), 345.

[7]Douglas J. Futuyma, *Evolutionary Biology*, 3d ed. (Sunderland, MA: Sinauer Associates, Inc. 1998), 5.

[8]Jacques Monod, quoted in Horace Judson, *The Eighth Day of Creation* (New York: Simon & Schuster, 1979), 217.

its rediscovery in 1900. It took until about 1950 for genetics to mature sufficiently as a science and for paleontology, microbiology, biochemistry, embryology, and the Darwinian evolutionary hypothesis to become folded together into one, comprehensive theory. Thus the "neo-Darwinian synthesis" is the proper name for the modern theory of evolution. It posits the survival of organisms with favorable genetic variations (that arose from random mutations) as dictated by random environmental constraints. The Darwinian process can be thought of as a series of sieves that sort replicating populations for individuals that have characteristics suitable to current environmental pressures. Just as a river cannot choose its path, neither can life. It takes whatever direction law and chance allow.

Chemical Evolution

Chemical evolution refers to naturalistic theories for the origin of life itself. Chemicals randomly produced in prehistoric oceans (the hypothetical "prebiotic soup") somehow formed living organisms, again by some "selection acting on random variation" motif. At present there is no accepted coherent theory as to how life could have arisen from a purely natural process. One scientist who specializes in the subject characterizes the task of finding an answer almost "hopeless."[9] Others are more optimistic.[10]

Most scientists (and laymen) continue to use the simpler term "evolution" to refer to both chemical and Darwinian evolution. We will use the term here to mean all evolutionary theories that are driven only by law and chance and not by design, including Darwinian evolution, chemical evolution, and naturalistic theories regarding the origin and development of the universe.

Naturalism/Scientific Materialism

Evolution is undergirded by a philosophy called naturalism. Naturalism is the doctrine that the laws of cause and effect (as in chemistry and physics) are adequate to account for all phenomena, and that design or teleological conceptions of nature are invalid.[11] The last phrase means that the design hypothesis is invalid a priori, as a matter of principle—not as a deduction from evidence. It requires a belief that we just "occur" as natural phenomena and that we are not designed or created for any purpose. By eliminating design, the philosophy of naturalism effectively eliminates supernatural explanations for any event occurring in nature. In-

[9]Having made a long and tortuous journey in search of the origin of life, some readers may feel disappointed. The alarming number of speculations, models theories, and controversies regarding every aspect of the origin of life seem to indicate that this scientific discipline is almost in a hopeless situation. Noam Lahav, *Biogenesis: Theories of Life's Origins* (Oxford: Oxford University Press, 1999), 302.

[10]*The National Academy of Sciences is more optimistic.* "For those who are studying the origin of life, the question is no longer whether life could have originated by chemical processes involving nonbiological components. The question instead has become which of many pathways might have been followed to produce the first cells." *Science and Creationism: A View from the National Academy of Sciences*, 2d ed. (Washington, D.C.: National Academy of Sciences, 1999). No hard evidence is presented to support this statement.

[11]Teleology is the study of the evidences of design or purpose in nature.

deed, the very function of naturalism is to eliminate the possibility of supernatural intervention from all scientific explanations. It is because of the "philosophies which inspire them" that Pope John Paul II has stated that "theories of evolution … are incompatible with the truth about man."[12]

This irrefutable assumption against design is also called "scientific materialism." It holds that all phenomena, even consciousness, can be reduced to matter and energy and that only physical causes operate. Design, which reflects the activity of a nonphysical mind, is not permitted. Although philosophers catalog numerous varieties of naturalism and materialism, they all reject design as an operative cause.

The commitment to a naturalistic worldview is clearly set forth by Professor Richard Lewontin, a Harvard geneticist:

> We take the side of science in spite of the patent absurdity of some of its constructs, in spite of its failure to fulfill many of its extravagant promises of health and life, in spite of the tolerance of the scientific community for just-so stories, because we have a prior commitment, a commitment to materialism. 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 material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counterintuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door.[13]

This statement illustrates how ID's opponents avoid engaging the two central problems associated with placing philosophical restrictions on origins science. First, we are not discussing all of science, we are discussing how life and its diversity originated. How something works and how it came to be are vastly different questions. Lewontin is correct that in the workaday world where scientists try to discover how life works, supernatural explanations are not invoked. But to assert that intelligence forces *never* played any role in the origin of life or its diversity is clearly a presupposition, a problematic assertion that cannot be tested by experiment or direct observation. Secondly, Lewontin completely ignores the obvious impact of the "commitment to materialism" on theistic belief.

Perhaps the clearest expression of how naturalism blinds science to evidence was made by Kansas State University biologist Scott Todd who said that "even if all the data point to an intelligent designer, such an hypothesis is excluded from science

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[12]"Consequently, theories of evolution which, in accordance with the philosophies inspiring them, consider the mind as emerging from the forces of living matter, or as a mere epiphenomenon of this matter, are incompatible with the truth about man. Nor are they able to ground the dignity of the human person." Pope John Paul II, message to the Pontifical Academy of Sciences (October 22, 1996), "Magisterium Is Concerned with Question of Evolution, for It Involves Conception of Man," *L'Osservatore Romano* (English), October 30, 1996, n. 5.

[13]Richard Lewontin, "Billions and Billions of Demons," *The New York Review of Books*, January 9, 1997, 31.

because it is not naturalistic."[14] Obviously, then, naturalism is not a deduction from experimental observations but a defining philosophy, a worldview. It presupposes only certain causes and eliminates all others by *definition*, not by *data*.

Although naturalism in practice has the effect of a doctrine or philosophy, many in science claim that it is merely a part of the "method" of science, and that it is not really a philosophical doctrine. In this respect it is called methodological naturalism rather than philosophical naturalism. That is, science has chosen, as its *method* of investigating nature, the exclusion of any nonmaterial forces as possible explanations for any observed phenomenon. This was recently acknowledged by the editor of *Scientific American*, John Rennie: "A central tenet of modern science is methodological naturalism."[15] Whether it is called philosophical or methodological naturalism is immaterial: the *effect* of this doctrine is to lead not only scientists but also the public to believe its central tenet, that life is not designed.

If the naturalistic assumption was not a doctrine and was truly used methodologically as an unproved assumption, it would be appropriately disclosed, and its acceptance would be optional and not required. An appropriate disclosure would explain the effect of the assumption on the credibility of the historical explanations provided and the way in which the assumption affects the selection and analysis of the data. The lack of disclosure of the naturalistic bias against design is evidenced by the absence of its discussion in science textbooks and other writings about evolution and origins. As explained by a popular science writer, Robert Wright, naturalism is one of the "unwritten rules of scientific conduct" that requires adherents "to scrupulously avoid even the faintest teleological [design] overtones."[16] The rule requires acceptance because those who break it are subject to insult and derision, loss of employment, manuscript rejection from peer-reviewed scientific journals, and virtual excommunication from the science community.[17]

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[14]Scott C. Todd, "A View from Kansas on that Evolution Debate," *Nature* 401.6752 (September 30, 1999): 423.

[15]J. Rennie, "15 Answers to Creationist Nonsense," *Scientific American* 287.1 (July 2002): 84.

[16]Robert Wright, *Three Scientists and Their Gods* (New York: Times Books, 1988), 70–71.

[17]"The important point is that there can be nothing purposive or teleological in evolution; any notion of inherent purpose would make nature less amenable to objective analysis. *For a biologist to call another a teleologist is an insult*." Robert Wesson, *Beyond Natural Selection* (Cambridge: MIT Press, 1991), 10. In 2000, an entire department at Baylor University, conducting scientific research on design detection in complex natural systems, was shut down because it conflicted with evolutionary theory. In March 2003, a professor of chemistry at Mississippi University for Women was fired for giving a presentation titled "Critical Thinking on Evolution"—which covered alternate views to evolution such as intelligent design. Ed Vitagliano, "Professor Dumped Over Evolution Beliefs," *Agape Press*, March 11, 2003. Former syllabus instructions for a required term paper in the course "Age of Dinosaurs," taught by Dr. Homer Montgomery at the University of Texas, Dallas, state: "Cautions about sources and topics.... If the thesis of your paper is anti-evolutionary (akin to arguing against the germ theory of disease or against the atomic theory of matter) *you will receive a failing grade*. *Scientific journals do not publish papers with creationist and ID*

> The scientific establishment bears a grisly resemblance to the Spanish Inquisition. Either you accept the rules and attitudes and beliefs promulgated by the "papacy" …. or face a dreadful retribution. We will not actually burn you at the stake, because that sanction, unhappily, is now no longer available under our milksop laws. But we will make damned sure that you are a dead duck in our trade.[18]

The lack of disclosure and the requirement for acceptance of the "Rule" is perhaps best exhibited in a recent policy adopted by the leading science organization in the United States, the American Association for the Advancement of Science (AAAS). The AAAS board "urges citizens across the nation to oppose the establishment of policies that would permit the teaching of 'intelligent design theory' as a part of the science curriculum of the public schools."[19] Without ever mentioning the existence of the irrefutable assumption against design, it urges the world to reject the design inference and to prevent it from being discussed in schools.

Intelligent Design

ID is a scientific theory that intelligent causes may have played a crucial role in the origin of the universe and of life and its diversity. It holds that design is empirically detectable in nature, and particularly in living systems. ID is an intellectual movement that includes a scientific research program for investigating intelligent causes and that challenges naturalistic explanations of origins that currently drive science education and research.[20]

The theory of intelligent design has been described by ID theorist Professor William Dembski of Baylor University as follows:

> Intelligent design begins with the observation that intelligent causes can do things that undirected natural causes cannot. Undirected natural causes can

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themes. I will certainly not accept them." The syllabus has since been revised. For the syllabus as of June 23, 2003, see http://www.utdallas.edu/dept/sci_ed/Homer/dinosyllabus.html. The argument that design theory is not scientific because it has not been "peer reviewed" is particularly disingenuous because of this "unwritten rule" against design that prohibits peer review of that theory. In fact, ID theory has been and is being peer reviewed. All of the work of both Michael Behe and William Dembski, leading scientists that articulate design theory, have been extensively peer reviewed and an enormous amount of work is being done to find naturalistic explanations to counter their arguments.

[18]Donald Gould, former editor of New Scientist, "Letting Poetry Loose in the Laboratory," *New Scientist* 135.1836 (August 29, 1992), 51. Despite the perils, a growing number of scientists are beginning to publicly declare their support for an objective approach to origins science. A list of more than three hundred, most of whom hold doctoral degrees, is posted at http://www.IntelligentDesignNetwork.org/polls.pdf. (June 10, 2003).

[19]"AAAS Board Resolution Urges Opposition to 'Intelligent Design' Theory in U.S. Science Classes," AAAS press release, November 6, 2002. [http://www.aaas.org/news/releases/2002/1106id.shtml] (June 10, 2003). A response to the AAAS resolution from IDnet may be viewed at] (June 10, 2003). The resolution was approved by the AAAS Board of Directors on October 18, 2002.

[20]For current research papers visit the International Society for Complexity, Information, and Design at http://www.ISCID.org. (June 10, 2003).

> place scrabble pieces on a board, but cannot arrange the pieces as meaningful words and sentences. To obtain a meaningful arrangement requires an intelligent cause. This intuition, that there is a fundamental distinction between undirected natural causes on the one hand and intelligent causes on the other, has underlain the design arguments of past centuries.[21]

To the unbiased eye, the design hypothesis veritably leaps from the study of nature. It is an instinctive mental reaction to the observed data. Even the most ardent evolutionary biologist acknowledges that living systems look designed for a purpose.[22] Currently ID scientists are developing ways to empirically and objectively test and confirm the hypothesis that life and certain aspects of its diversity may be the product of an intelligent cause. They do this not only by showing positive evidence of design that "rules in" the hypothesis (e.g., the existence of cellular message-bearing systems), but also by seeking evidence that "rules out" the competing naturalistic hypotheses of chemical evolution, Darwinian evolution, and a variety of new "self organization" theories.

Creation Science

Creation science seeks to validate a literal interpretation of creation as contained in the book of Genesis in the Bible. Creation science was defined in a statute that was litigated in a 1982 Arkansas case.[23] In that case, the district court found that, as defined, the teaching of "creation science" was unconstitutional because it was, in effect, a restatement of the Genesis account of origins, and that teaching this material would have the effect of promoting that particular religious view. A similar "creation science" statute was held to be unconstitutional by the Supreme Court in the case of *Edwards v. Aguillard*[24] where the holding was based on the same reason—that the statute had the effect of promoting a particular religious view.

Relationship between Intelligent Design and Creation Science

Intelligent Design is not creation science. ID is simply an hypothesis about the direct cause of certain past events based on an observation and analysis of data. ID does not arise from any religious text, nor does it seek to validate any scriptural account of origins. An ID proponent recognizes that ID theory may be disproved by new evidence.

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[21]William Dembski, "The Intelligent Design Movement," *Cosmic Pursuit* 1.2 (Spring 1998): 22–26.

[22]"Biology is the study of complicated things that give the appearance of having been designed for a purpose." Richard Dawkins, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design* (New York: W.W. Norton & Company, 1996), 1. According to Francis Crick (codiscoverer of the structure of DNA, Nobel laureate, 1962), "biologists must constantly keep in mind that what they see was not designed, but rather evolved." Francis Crick, *What Mad Pursuit: A Personal View of Scientific Discovery* (London: Penguin Books, 1990), 138.

[23]*McLean v. Arkansas Board of Education*, 529 F.Supp 1255 (E.D. Ark 1982).

[24]*Edwards v. Aguillard*, 482 U.S. 578 (1987).

ID is like a large tent under which many religious and nonreligious origins theories may find a home. ID proposes nothing more than that life and its diversity were the product of an intelligence with power to manipulate matter and energy. Period. This is not inconsistent with "literal Biblical creationism," nor Islamic, American Indian, or any religious heritage that invokes a Creator. ID simply does not address the specifics of creation—the why and who—not because ID theorists are protecting a hidden agenda but because the data do not compel firm answers to those questions. ID addresses one question only: is life the product of a guided or an unguided process? Did it arise from a mind or from the meaningless meandering of molecules in mindless motion?

Theistic Evolution

According to Gallup Polls[25] taken over the last two decades (Table 1), over eighty percent of Americans believe in some form of God-guided process, although they may not know it by the term intelligent design. About half of these hold to a "young earth, literal Genesis" perspective, and the other half to what has been termed "theistic" or "God-guided" evolution.

If evolution is defined as "change over time," then clearly one can believe in God *and* evolution because God could have directed the change. But it is precisely here where definitions are so critical, because if one defines evolution as do the scientists quoted above (i.e., unguided and unplanned accidents), then it is logically difficult to believe in a God other than one who has simply thrown the dice without intending any particular outcome. Thus if God used a random evolutionary process, by definition only purposeless and unintended outcomes will result. It is self-contradictory to believe in a "guided, unguided" process. Professor Kenneth Miller discusses this dilemma:

> As [Kurt] Wise makes clear, he believes that the real danger of evolutionary biology to Christianity is not at all what most scientists might suspect. It is not that evolution's version of natural history threatens to unseat the central Biblical myths of unitary creation and the Flood. Rather, it is the chilling prospect that evolution might succeed in convincing humanity of the fundamental purposelessness of life. Without purpose to the universe, there is no meaning, there are no absolutes, and there is no reason for existence.[26]

Those who believe in a "dice-throwing" god are closer to deists than to theists. A deist is one who is happy to allow the existence of a god that perhaps created matter and the laws of nature, but then took a walk and has not been seen since. This god "let the chips fall where they may." Such a god does not intervene in the natural world; he started the ball rolling and then vanished, leaving evolution to do the real "creating." This is not the view of God that most theistic religions (Christian, Jewish, Muslim) embrace.

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[25]Kenneth Chang, "Evolutionary Beliefs: Views in U.S. Much Different Than Elsewhere," *ABC News*, August 16, 1999. [http://abcnews.go.com/sections/science/DailyNews/evolutionviews990816.html] (July 2, 2003).

[26]Kenneth R. Miller, *Finding Darwin's God: A Scientists Search for Common Ground Between God and Evolution* (New York: HarperCollins, 1999), 187.

Table 1. Gallup Polls[a]

Year	Creation Science[b]	Theistic Evolution[c]	God-Guided Process[d]	Atheistic (or Diestic) Evolution[e]	No Opinion
1982	44%	38%	82%	9%	9%
1991	47%	40%	87%	9%	4%
1993	47%	35%	82%	11%	7%
1997	44%	39%	83%	10%	7%
1999	47%	40%	87%	9%	4%
2001	45%	37%	82%	12%	6%

[a]Column headings are the authors', not the Gallup Organization's.

[b]Agreed with the statement, "God created human beings pretty much in their present form at one time within the last 10,000 years or so."

[c]Agreed with the statement, "Human beings have developed over millions of years from less advanced forms of life, but God guided this process."

[d]Sum of Creation and Theistic Evolution

[e]Agreed with the statement, "Human beings have developed over millions of years from less advanced forms of life. God had no part in this process."

Some attempt to reconcile science with religion by defining each as "nonoverlapping magisteria," two completely separate and distinct "ways of knowing."[27] According to this concept the function of science is to provide "objective" knowledge of reality while religion deals only with "subjective" spiritual impressions. This attempted demarcation only exacerbates the problem rather than solving it because the magisteria actually do overlap when both offer an answer to the same question: Where do we come from? Theism holds that humanity was designed for a purpose, while science claims that design and the purposes it serves are an illusion.[28] A recent example of the depth of the confusion is a resolution adopted by the

[27]"Magisteria" is derived from the Latin word for "teacher." Stephen J. Gould asserts that science and religion are separate and distinct teaching authorities. Unfortunately, no true intellectual weight is given to the pronouncements of the latter. See idem., *Rocks of Ages: Science and Religion in the Fullness of Life*" (London: Jonathan Cape, 2001).

[28]Mano Singham describes the inherent problem with the overlapping magisteria in "The Science and Religion Wars," *Phi Delta Kappan* 81 (February 2000): 426. Although recognizing the problem as very real and significant, he has no solution. The solution we suggest is for science to simply stick to what we expect it to do—investigate and explain origins objectively using the scientific method without bias and confine its explanations to those permitted by the data and logical analysis. The emerging speculative issues such as the inherent purpose of life, if any, then naturally fall into the domain of religion. So long as science conducts the investigation objectively like an umpire at a ball game, neither side should have cause to complain (other than the normal litany of epithets that are hurled at any

Presbyterian Church USA (PCUSA) in which "evolution" is held to be consistent with a "God as Creator."[29] The problem is that evolution is not defined in the resolution. If by evolution, the PCUSA means "change over time," then the statement may be accurate, but if evolution means "unguided, blind, unintended change," then the statement is logically inconsistent.

The deistic evolutionist also holds that because there is no evidence of design in nature, belief in a God cannot be based on "natural revelation," that is, on evidence for God in nature.[30] According to Christian scriptures, the design apparent in nature is real. As a consequence, the deistic evolutionist is left only with subjective personal spiritual experience as a basis for belief. Logically the deistic evolutionist would be virtually indistinguishable from a strict Darwinist. The theistic evolutionist, who believes that life was somehow planned, would find support in ID theory.

Richard Dawkins has said that the attempt to meld naturalism with theism is just "an attempt to woo the sophisticated theological lobby and to get them into our camp and put the creationists into another camp. It's good politics. But it's intellectually disreputable."[31]

The Detection of Design

The central claim of ID theory is that design is empirically detectable. For most people, design detection is an intuitive process that occurs without any thoughtful deliberation. This was most famously described over two hundred years ago by William Paley in his book *Natural Theology*.[32] While walking in the countryside, he would frequently encounter stones on the ground. If he thought about it at all, he would conclude that they were simply natural objects formed by materialistic forces. On the other hand, if he happened upon a pocket watch lying in the grass, his conclusion would be that it was formed by an intelligent source. Why? Because upon inspection he would discover that the watch, unlike the stone, was made up of

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umpire!). See our response to Dr. Singham in John Calvert and William Harris, "Ending the War Between Science and Religion." [http://www.intelligentdesignnetwork .org/endingwar.htm] (June 10, 2003).

[29]The resolution reaffirms that "there is no contradiction between an evolutionary theory of human origins and the doctrine of God as Creator." John Filiatreau, "GA affirms 'God's Gift' curriculum," 214th general assembly news, June 20, 2002. [http://www.pcusa.org/ga214/news/ga02108.htm] (June 10, 2003).

[30]"Since what may be known about God is plain to them, because God has made it plain to them. For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, *being understood from what has been made, so that men are without excuse.*" Rom 1:19–20, emphasis added. The commentary for this verse states: "Atheists have no excuse. Open minded attention to the nature of creation makes the existence of God evident." *New International Version Disciples Study Bible* (Holoman Bible Publishers, 1988), 1417.

[31]Quoted in Edward Larson and Larry Witham, "Scientists and Religion in America," *Scientific American* 283.9 (September 1999).

[32]William Paley, *Natural Theology* (n.p.: New York: American Tract Society, n.d.), 9–10.

multiple finely shaped and interacting parts all working together to accomplish one purpose: to tell time. While such a scenario is easily imagined, and his conclusion would not be challenged by any reasonable person, he did not reach it by a direct, step-by-step scientific process. He just "knew" it to be designed. If Paley found a cell phone on the ground, he would still conclude that it had been designed even though he would have no idea of its purpose. Recall the stir that a Coke bottle falling from the sky engendered among the African tribe in the movie, "The Gods Must Be Crazy." One mind can "sense" the creative activity of another mind.

Although this intuition works well for human-made objects, can it be applied to living objects that we absolutely know were not "handcrafted?" In other words, can it apply to biology? Gene Myers, one of the lead scientists on the Human Genome project, stated in an interview in 2000: "'What really astounds me is the architecture of life,' he said. 'The system is extremely complex. It's like it was designed…. There's a huge intelligence there.'"[33] How can we know if Myers's intuition is correct? What if his (and our) minds are fooling us? What if our intuition is wrong and the design we see in living systems is just an illusion, as evolutionary biologists claim? Is there any way to check or confirm our intuition?

Methods of Design Detection

If we are to scientifically determine whether an object or event was designed, we have to have more than intuition at our disposal. We need a formalized, objective, and systematic approach to the question. That is precisely what William Dembski has begun to explore. In his book *The Design Inference*,[34] Dembski outlines a methodology for detection of design using a "design-detection filter." This logical construct recognizes that there are only three explanatory causes for any event, pattern, or object (past or present): chance, necessity (natural law), and design. The naturalistic hypothesis assumes that only chance and necessity have operated to generate life and its diversity, whereas the design hypothesis postulates that all three causes may have played a role. Design detection essentially seeks evidence that rules in design and that also rules out chance and necessity.

A way to apply Dembski's filter is to first ask whether a pattern in question exhibits function, structure, or purpose that is independent of the meaning or significance of each of the elements that make up the pattern. For example, the pattern "DESIGN" conveys a recognizable meaning that is independent of the significance or meaning of each of the letters which comprise the pattern. Professor Dembski calls this a "specification." The sequence "NDISGN," lacks a specification and therefore cannot support a design inference.

The next step is to determine whether this apparently meaningful pattern could be explained by some law or regularity. Is the pattern required to be so? Do the

[33]Tom Abate, "Human Genome Map Has Scientists Talking about the Divine: Surprisingly Low Number of Genes Raises Big Questions," *San Francisco Chronicle*, February 19, 2001.

[34]William A. Dembski, *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge: Cambridge University Press, 1998), 36–66.

elements that make up the pattern *have* to take that specific form? If so, then design may not be inferred.

If the pattern is not required, then we proceed to the final step, which is to determine whether the pattern could have occurred by chance. If the pattern is relatively simple, so that chance could reasonably explain it, then design may not be inferred. However, if it is too complex to be explained by chance, then the design inference is warranted. A pattern which is deemed by the filter to have been designed is one that exhibits what Dembski calls "specified complexity." A design inference requires not only complexity, but specification. It must match an independently given pattern.

"TDlPH,B;5H;Nn;E/" is a complex pattern, but it lacks specification, it has no meaning. A wave pattern on a beach is regular but lacks complexity. Similarly, the pattern "DESIGN" is specified, but being only six characters long lacks sufficient complexity to confidently lead to the conclusion that it appeared on purpose instead of accidentally. The Gettysburg Address, on the other hand, is both complex and specified. The following discussion of the three causes should help the reader understand this important concept.

The Three Explanatory Causes

Chance. Events can occur by chance. A chance event is one that a) cannot be predicted, and b) is not controlled by intent or law. Anyone who has patronized a casino, played cards, or flipped a coin knows the meaning of chance. With the use of statistical calculations we can predict the likelihood that a given event will occur although we cannot know for certain when or where it will occur. For example, how likely would it be that we could spell the word "DESIGN" by blindly pulling Scrabble tiles out of a bag of twenty-six tiles (one for each letter of the English alphabet that is replaced after each drawing)? This can be calculated. The chance of pulling the D is 1 in 26; the chance of pulling D *and* E in sequence is $1/26^2$ which is 1 in 676. Thus, the chance of spelling D-E-S-I-G-N out of the bag is $1/26^6$ or one chance in 308,915,776 (or $10^{8.5}$). Stated more simply (but less precisely), it would take us nearly 309 million cycles of pulling six tiles out of the bag to be sure we would assemble the word DESIGN at least once. This is only a six-letter pattern; if we wanted to spell "HAMBURGERS," it would take 141 *million million* cycles (i.e., the chances are 1 in 10^{14} that you could obtain this pattern on the first try). Clearly, as the complexity of the pattern increases, the probability that it was "caused" by chance decreases exponentially. Most scientists would acknowledge that any event having a probability of occurring that is less than 1 in 10^{150} is virtually impossible.[35]

[35]Dembski calculates the outside limit of probability to be 1 in 10^{150}. He arrives at this number by multiplying: a) the total number of elemental particles estimated to exist in the entire universe (10^{80}); times b) the number of transitions that each elemental particle can make in a second (10^{45}); times c) a billion times (10^9) the estimated age of the universe (about fifteen billion years, or 10^{16} seconds) which is about 10^{25} seconds. William Dembski, *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence* (Lanham, MD: Rowman & Littlefield 2002), 21–22; see also idem., *The Design Inference*, sec. 6.5.

Necessity (or Natural Law). Events, patterns, or objects can also arise by "necessity." A necessary event is one that is required to occur by the laws of chemistry and physics. A salt crystal is an example of a pattern arranged only by chance and necessity without any direct input from a mind. When a solution of sodium and chlorine ions becomes supersaturated, the positively charged sodium ions will be attracted to the negatively charged chlorine ions to form a cube. The path a river takes as it crosses the continent is dictated by the law of gravity and the presence of matter (water, rocks, etc.). The rainbow that appears when white light is passed through a prism is the result of the interaction of electromagnetic radiation with a certain shape of glass. In each of these cases the pattern is "caused" by the natural and forever reproducible behavior of matter driven by natural law.

Design. The third possible cause for an event, object, or pattern is design. A designed event, object, or pattern is one that was originally conceived by a mind or intelligence, and then brought into being "on purpose" by manipulation of matter and energy. Every human-made object in history was the result of design; each was intended. This very document consists of a pattern of many events (letters, numbers, characters, and punctuation marks in a unique sequence) arranged by a mind and using the material elements of ink and paper. Both design (choosing the language and the words) and necessity (ink has to stick to paper) "caused" this document. Nature is filled with both human and nonhuman "minds," and some scientists are searching for alien minds. Hence, it is not absurd to postulate the existence of other unseen minds that may have operated in the past.

An example of all three "causes" at work in a series of three events is the flipping of a coin. The decision and action of flipping are designed or intended; the falling of the coin in topsy-turvy flight up and down is dictated by the law of gravity; and the outcome—heads or tails—is the result of chance.

Many well-accepted, uncontroversial scientific disciplines are utterly dependent on detecting design, on inferring the past actions of an intelligent agent by examining present evidence:

- Forensic Sciences, where a death is investigated to determine whether the person died by accident (i.e., chance/necessity) or by intent (i.e., murder).
- Cryptanalysis, where code breakers examine patterns of characters to determine whether they convey a message or are simply random and meaningless noise.
- Archaeology, where artifacts are examined to determine whether they were fashioned by man or by nature. Is the rock just a stone, or a tool?
- Arson investigation, where one attempts to discern from charred remains whether the fire was set intentionally (by design) or resulted from a frayed wire (chance/necessity).
- Copyright infringement and plagiarism, where scientists examine writings to determine whether they were accidentally or intentionally similar to the work of others.

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Figure 1. The pattern containing a sequence of prime numbers as presented in the movie "Contact."

Search for Extraterrestrial Intelligence (SETI)

One of the clearest examples of design detection can be found in the SETI program. The SETI program is systematically scanning the heavens with radio telescopes, searching for patterns of signals that could only come from intelligent sources. In the fictionalized version as presented in Carl Sagan's book (and the movie) "Contact," the research team actually discovers a pattern of pulses (1's) and pauses (0's) beating out the first twenty-five prime numbers, in order, from 2 to 101 (Figure 1). They cry, "Eureka! We've made contact!" Why would they come to such a conclusion? Is their shout of exuberance justified? If we subject this pattern to the design detection filter, do we reach a scientifically valid inference of design?

Step 1. Does the sequence contain a message or meaning that is independent of the significance of each of the symbols that make up the pattern? Yes. A pulse or a pause has no independent meaning, only the pattern (the sequence of prime numbers) has significance.

Step 2. Is the sequence determined by known physical laws? Did it have to be that way? No.

Step 3. What is the probability that the sequence was produced by chance? At one level,[36] this is a straightforward calculation: there are two options—a pulse or a pause, yes or no, zero or one. There are 1,126 "events" (pulses or pauses) in the sequence. So the probability of it occurring by chance is 1 in $2^{1,126}$ or about 1 chance in 10^{338}. Since that number is vastly greater than 10^{150}, we exclude chance as a reasonable cause of the pattern. So what are we left with? There are only three causes: design, chance, and necessity. After ruling out the latter two and finding meaning consistent with design, we (and the SETI researchers) conclude that the best (current) explanation for the source of the pattern was a mind. Eureka!

From SETI to DNA

If the logic illustrated in the SETI example is scientifically valid (if no reasonable person would quibble with the conclusion), then we can apply exactly the same approach to any object in nature. We can be confident that, if the filter leads us to a design inference, it is the most reasonable conclusion. So let us leave outer space and peer as deeply into inner space, into the heart of the tiniest unit of life: the cell. Here, we enter the oldest known organism on earth—a bacterium which is postulated to have arisen by unknown natural processes almost at the time the earth became habitable to any form of life.[37] What do we find? We find a vast library containing the instructions for the synthesis of all cellular proteins, the chemicals that are the *sine qua non* of life. DNA is a very long molecule (for the simplest cell, over four million "letters" long) carrying coded messages. It is arranged much like books in a library. Books are made up of letters strung together to make sentences which themselves comprise paragraphs, chapters, and finally entire books. There are hundreds of these DNA "books" in the simplest cell. We now ask, should the discovery of DNA in a cell elicit the same "Eureka!" as the discovery of a sequence of prime numbers arriving from outer space? We need to run the filter.

Step 1. Does the DNA sequence contain information, does it have a purpose? *Yes*. It provides the "instructions" for the assembly of molecular machines that perform the life functions of the cell. Each DNA "letter" is completely meaningless,

[36]At another level, it is impossible to evaluate the likelihood of receiving such a pattern since the total number of generated pauses and pulses in the entire universe would have to be considered to more accurately assess the chance that this particular pattern would appear. Nevertheless, the chance that receipt of an information-rich string of 1,126 events would *not* be considered evidence of intelligent agency by the SETI astronomers is nil.

[37]Hans D. Pflug, "Earliest Organic Evolution: Essay to the Memory of Bartholomew Nagy," *Precambrian Research* 106.1–2 (February 1, 2001): 79–91. "On the basis of such studies, the interaction of microorganisms with the formation of minerals can be traced back to early Archean times, thirty-eight hundred million years ago. There is no indication supporting the assumption that some kind of prebiotic evolution took place in the recorded history of the Earth. The origin of life is open to alternative explanations, including extraterrestrial phenomena."

it is only the chain, the sequence, the pattern of letters that contains meaning.[38] The meaning is independent of the significance of each of the symbols. It is a pattern that functions in the same way that sequences of letters of the English alphabet are used to convey meaning.

Step 2. Is the sequence determined by physical *laws*? No. If a law determined the sequence, then the sequence could carry no information. Why? When writing a sentence in English, does every letter "a" *have* to be followed by a letter "b"? Does some law dictate that "c" always follow "b"? Of course not; if they did, we could not spell any words and we could have no (written) language. It is precisely because any letter can follow virtually any other letter that gives our alphabet the ability to support a language, a means of communication.[39] So with DNA; if the order of its symbols was determined by a chemical law then it could not carry the vast amount of information necessary for life. It is precisely because any genetic letter can follow any other genetic letter that allows the genome to carry an almost infinite array of instructions necessary to produce the variety of life on Earth. Irregularity is essential, and laws only produce regularities (that is why they are called laws).

Step 3. What is the probability that DNA assembled by *chance* in the first cell? It is postulated that the first cell would need at least three hundred genes to become a functioning organism capable of replication. The statistical probability of assembling a *single* gene coding for one hundred amino acids by chance alone to be something in the order of $1x10^{-190}$ has been calculated.[40] So our answer is No, the likelihood that a functional DNA chain appeared by chance is essentially zero.

We are driven by the data and the facts to the most logical conclusion: the message carried by the DNA in the first functional cell has all the hallmarks of having been derived from an intelligent source. A meaningful sequence discovered in outer space strongly suggests "intelligent aliens" (although none have ever been seen). That is an acceptable scientific inference because it suggests that life arose on other planets. On the other hand, can a vastly more complex and meaningful "signal" discovered inside a living cell—in our bodies—have derived from an intelligent source? No, that is not an acceptable inference, not as long as science is controlled by a naturalistic philosophy, a philosophy that denies that intelligent causes

[38]The "letters" of the DNA alphabet are chemicals strung in sequence along a sugar-phosphate polymer. They are called adenine (A), cytosine (C), guanine (G), and thymine (T). Each set of three letters (a codon) is later translated into one amino acid in the protein for which that particular strand of DNA (called a gene) codes.

[39]Each language has its own rules about what letters can be joined and produce sequences (words) that have meaning. In English, "q" is always followed by "u", and "j" and "z" never go together. In DNA, there are millions of potential sequences that would have no meaning at all, that is, when translated into proteins, they would produce a protein that does nothing whatever. Similarly, the word "jzuqr" means nothing in English.

[40]This is a statistical impossibility. Walter L. Bradley and Charles B. Thaxton, "Information and the Origin of Life," in J.P. Moreland, ed., *The Creation Hypothesis: Scientific Evidence for an Intelligent Designer* (Downers Grove, Il.; InterVarsity Press, 1994), 190.

have played any role in the origin of life. If naturalism is true, then DNA must *by definition* be the product of natural laws and random variations even if our analysis says it is impossible. This is the conundrum that strict adherence to naturalism engenders, and this is why we believe it is scientifically counterproductive.

Evidence Supporting Intelligent Design

The evidence for design theory is composed of both evidence *for* design as well as evidence *against* the naturalistic theory. As noted above, when there are only two possible explanations, evidence against one is evidence for the other.

Apparent Design

Perhaps the most direct and compelling evidence for design is simply the *appearance* of design in living systems. It is the evidence that we detect with our intuition when we find an arrowhead or study the human eye. It is the evidence that convinced Aristotle, Socrates, Plato, Copernicus, Galileo, Newton, Bacon, Boyle, and even Einstein of design in the universe. Apparent design formed the foundation for science until very recently,[41] and it is this intuition that led Richard Dawkins and Gene Myers (quoted above) to see design in biology.

In science, the most obvious and simplest explanation is usually accepted first but may be challenged by new data. Until such data (not hints, suggestions, or wishful thinking) actually disprove the original hypothesis, it should not be abandoned. For the first four thousand years of recorded human history, the design hypothesis was virtually universally accepted, and the job of the scientist was not to discover how the world came to be (that was a given), but how the created world worked. In the mid-eighteenth century Hume challenged the logic of the design inference but offered no alternative. Darwin provided that alternative—a viable competing naturalistic hypothesis. Much of his world (which like him was completely ignorant of the true complexity of life) was easily convinced. But modern science (especially in the last half of the twentieth century) has discovered the mind-boggling intricacy of cellular (and cosmic) structure and function. It is these discoveries that have begun to drive scientists to reconsider the merits of the design hypothesis.[42]

Irreducible Complexity

"Law and luck" explanations of life's origins are rendered less likely in light of observations relating to the nature of cellular complexity. Biochemist Michael Behe has argued that many biological mechanisms in living organisms are "irreducibly complex." An irreducibly complex system is a "single system [which is] necessarily composed of several well-matched interacting parts that contribute to the basic

[41]See Michael Denton, *Evolution: A Theory in Crisis* (Bethesda, MD: Adler and Adler, 1985), ch. 6, "The Systema Naturae from Aristotle to the Cladists," 119–141.

[42]Over two hundred scientists have publicly endorsed the following statement: "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." [http://www.discovery.org/articleFiles/PDFs/100ScientistsAd.pdf] (June 11, 2003).

function, wherein the removal of any one of the parts causes the system to effectively cease functioning."[43] The adjective "irreducible" means the system cannot be "reduced" to a simpler, *functioning* system that could develop into a more complex system.

Behe points to the bacterial flagellum as an example of an irreducibly complex biological system. This biological machine is a high-speed rotary motor that turns a propeller to move a bacterium towards food or away from danger. It requires at least forty, highly complex, interlocking, moving protein components for assembly and operation and is believed to have been a fully functioning component of the most primitive cells. It will not work unless all the parts are present together at the same time. Dr. Behe contends that natural selection cannot build such a machine because, in isolation, the individual parts have no Darwinian selective value (i.e., they have no survival function that natural selection can "choose" because it works better than the original). In Behe's words,

> An irreducibly complex system cannot be produced directly (that is, by continuously improving the initial function, which continues to work by the same mechanism) by slight, successive modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional. An irreducible complex biological system, if there is such a thing, would be a powerful challenge to Darwinian evolution. Since natural selection can only choose systems that are already working, then if a biological system cannot be produced gradually it would have to arise as an integrated unit, in one fell swoop, for natural selection to have anything to act on.[44]

Natural law and chance alone have never been shown to assemble even one of the protein subunits of the hundreds of highly complex, integrated, multicomponent, macromolecular machines present in single-celled organisms.[45] Absent the faculty of a mind to perceive, decide, plan, and direct the arrangement and coordination of events, mechanisms of chance and necessity appear to be creatively impotent in concept alone.

Biological Information

Living systems are characterized by the presence of vast amounts of *information* (e.g., DNA). There is no known physical or chemical law or process that can produce information that has a semantic charateristic; complexity, yes, but not information. The semantic or meaningful quality does not flow from matter or en-

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[43]Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: The Free Press, 1996), 39; and idem., "Reply to My Critics: A Response to Reviews of Darwin's Black Box: The Biochemical Challenge to Evolution," *Biology and Philosophy* 16.5 (2001): 694–695.

[44]Behe, *Darwin's Black Box*, 39.

[45]A good example of the incredible complexity of even simple cells is the recent report that each yeast cell contains at least 232 distinct multiprotein complexes; twenty-three of which contained over thirty separate protein chains. A.-C. Gavin et al., "Functional Organization of the Yeast Proteome by Systematic Analysis of Protein Complexes," *Nature* 415.6868 (January 10, 2002): 141–147.

ergy alone. The only force in our experience known to produce meaning is a mind. For example, the letter sequence "SGIDNE" conveys no meaning. However the same letters rearranged into "DESIGN" have something new—meaning, information derived from a mind—but no more matter. This is explained by astronomer Paul Davies:

> Snowflakes contain syntactic information in the specific arrangement of their hexagonal shapes, but these patterns have no semantic content, no meaning for anything beyond the structure itself. By contrast, the distinctive feature of biological information is that it is replete with meaning. DNA stores the instructions needed to build a functioning organism; it is a blueprint or an algorithm for a specified, predetermined product. Snowflakes don't code for or symbolize anything, whereas genes most definitely do. To explain life fully, it is not enough simply to identify a source of free energy, or negative entropy, to provide biological information. We also have to understand how *semantic* information comes into being. It is the quality, not the mere existence, of information that is the real mystery here.[46]

Similarities in Biological and Human-Made Systems

Those favoring Darwinism and the power of evolution to "create" depend heavily on arguments from similarities: molecules across life forms are *similar*, body plans of different animals are *similar*, etc. Of course, similarity can just as easily point to a common designer, and the evolutionists' failure to exclude that possibility (based on evidence and not philosophy) keeps design as a live possibility. Scientists are discovering that many biological systems have the same characteristics as human-made systems. One example is the Morse Code's conceptual similarity to the genetic code. In fact the latter was discovered using human-made coding systems as an analogy.[47] A falcon is far more complex than the F-16 Fighting Falcon that bears its name, and the nano-scale motor that drives the bacterial flagellum outperforms any human-made electric motor. The similarity between complex human-made and biomolecular machines and information processing systems supports the design hypothesis. If "similarities" are admissible evidence for the Darwinian position, then they are admissible for the design hypothesis.

Abrupt Appearance of Fossil Phyla

Darwin's theory of natural selection is based on the assumption that differences in life forms develop gradually over long periods of time through an accumulation of very small changes. However, the fossil record contradicts this prediction. To begin with, current evidence suggests that the first living cells appeared on earth almost immediately (within a few million years) after the temperature on earth be-

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[46]Paul Davies, *The Fifth Miracle: The Search for the Origin and Meaning of Life* (New York: Simon & Schuster, 1999), 60.

[47]"The scientists who discovered the nature of the genetic code had coding analogy constantly in mind, as the vocabulary they used to describe their discoveries makes clear…. If, instead, the problem had been treated as one of the chemistry of protein-RNA interactions, we might still be waiting for an answer." John Maynard Smith, "The Concept of Information in Biology," *Philosophy of Science* 67 (June 2000): 183–184.

came habitable to life.[48] Although scientists initially predicted that it would take billions of years for life to arise, the appearance of bacterial life so close to the time that the earth's temperature fell below boiling suggests a sudden rather than gradual appearance of life. The rapid advent of over forty new and distinct life forms is also chronicled in the "Cambrian explosion" which took place about 550 million years ago.[49] The essentially simultaneous appearance of virtually all the major body plans is directly contrary to Darwinian theory. Stephen J. Gould and Niles Elderidge proposed the theory of "punctuated equilibrium" in an attempt to "explain" the sudden appearance of life forms.[50] Unfortunately it does not actually *explain* anything; it simply posits that evolution happened in fits and starts when no one was looking, and animals changed so quickly that there was either not enough time for fossilization or there were too few "intermediates" to fossilize. This is not evidence—it is wishful thinking, and there are no known biochemical mechanisms that can support sudden, large scale changes in the genome. In either case, both a gradual or an abrupt appearance of life over time can be accommodated by the intelligent design theory since ID is not about the *rate* of change but about the *control* of life's development.

ID does not claim that no evolutionary process is involved in the origin of various species. It merely claims that evolution is inadequate to explain all of the diversity of life.

The Fine Tuning of the Universe

Many astrophysicists and cosmologists have recognized for years that the universe appears to be "fine tuned." "Fine tuned" (synonym for "designed") refers to the existence of very precise and intricately balanced mathematical constants underlying physical laws. The force of gravity, the mass of the electron, the charge of the proton, etc. are specific, real values. Were they even slightly different from what they are, not only would life not exist, *nothing* (of any significance) would exist. Martin Rees admits that the only two satisfying solutions to the observed fine tuning are either design or the very speculative possibility that our universe might just be one of an infinite number of independent, parallel universes, thereby rendering the existence of our "fine tuned" universe more probable.[51] As a committed naturalist, he must invoke the evidenceless existence of multiple unseen and undetectable universes in order to avoid a design conclusion. Consider the Earth. Far from being just a minor planet in a minor solar system revolving around a minor star in the backyard of one very average galaxy among billions, evidence has been presented that the location of the Earth in the

[48]Lahav, *Biogenesis*, 158, at note 11. Also see note 37 above.

[49]S.A. Bowring et al., "Calibrating Rates of Early Cambrian Evolution," *Science* 261.5126 (September 3,1993): 1293–1298.

[50]Stephen J. Gould, "The Meaning of Punctuated Equilibrium and Its Role in Validating a Hierarchical Approach to Macroevolution," in R. Milkman, ed., *Perspectives on Evolution* (Sunderland, MA: Sinauer Associates, Inc., 1982), 83–104.

[51]Martin Rees, *Just Six Numbers: The Deep Forces that Shape the Universe* (New York: Basic Books, 1999), 148–151.

universe is remarkably unique.[52] Thus, the evidence of the "fine tuning" of the universe and the placement of the Earth are evidence favoring design.

In addition to these signs and evidences *for* ID, there are findings that fail to support the counterargument. These further strengthen the design position.

Statistical Studies

Mathematical analyses indicate the unimaginable improbabilities of complex biological systems arising by chance-based Darwinian mechanisms. The improbability of the synthesis of the genetic code alone (not to mention the thousands of other biomolecules) is also discussed by Noam Lahav, Walter Bradley and Charles Thaxton, and Robert Shapiro.[53]

Evolution Has Not Been Observed or Simulated

The inability to observe or test the power of the evolutionary mechanism to produce new and functionally different organisms is perhaps the most challenging problem for the evolutionary biologist. This has led to a number of attempts to simulate evolution on a computer.[54] Although new simulations are frequently announced, none appear to have come close to success.[55] Dembski predicts that computer simulations are bound to fail because systems operating only via law and chance are inherently incapable of generating specified complexity.[56]

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[52]Peter D. Ward and Donald Brownlee, *Rare Earth: Why Complex Life Is Uncommon in the Universe* (New York: Copernicus, 2000).

[53]"In spite of a continuous effort by hundreds of scientists since then [1954], the problem of the origin of the genetic code has not been solved as yet. In retrospect this is expected, in view of the complexity of the protein synthesis machine. Given such a complex system, containing more than a hundred components (Lacano, 1994)**,** it is not surprising that Moras (1992) noted with much pessimism that 'the absence of a direct link between the anticodon loop and the site of aminoacylation suggests that the search for a simple stereochemical correlation between the three-letter genetic code and the amino acid or the synthetase (associated with the idea of a second genetic code) is hopeless.'" Noam Lahav, *Biogenesis*, 209. See also Bradley and Thaxton, "Information and the Origin of Life;" Robert Shapiro, *Origins: A Skeptics Guide to the Creation of Life on Earth*, (New York: Bantam 1986), 117–131.

[54]R.E. Lenski et al., "The Evolutionary Origin of Complex Features," *Nature* 423.6936 (May 8, 2003): 139–144. It should be noted that such computer simulations serve not to strengthen but to weaken the naturalistic hypothesis simply because intelligent intervention was essential for the creation of the rules and constraints (not to mention the computer itself!).

[55]David Berlinski, "A Scientific Scandal," *Commentary* 115.4 (April 2003): 29–37; this is a scathing critique of a nonexistent computer simulation of the evolution of the eye that has been touted for years as incontrovertible evidence of evolution.

[56]Dembski, *No Free Lunch*, 179–228; see also idem., *Design Inference*. A recent collection of essays by prominent scientists including Paul Davies, Stuart Kauffmann, and William Dembski is devoted to the problem of finding a law that might explain biocomplexity. See his introduction in Niels Gregersen, ed., *From Complexity to Life: On the Emergence of Life and Meaning* (Oxford: Oxford University Press, 2002), 10–13. Dembski's contribution deals with the inadequacy of genetic algorithms to solve the problem.

Evidence Misrepresented

A recent book titled *Icons of Evolution* details many misleading teachings about evolution found in textbooks used around the country.[57] Although *Icons* is focused on misinformation, its rigorous analysis points out many significant problems with evolutionary theory.

Arguments against Design Theory

Although the application of design detection methodologies to living systems leads many to the conclusion that they are designed, not everyone agrees. Thus, as an atheist, the most famous living critic of design, Professor Richard Dawkins of Oxford University cannot accept the possibility of the existence of an intelligent designer. He says that design in life is only *apparent*; just an illusion.[58] The true "designer" for Dawkins is Darwinian evolution—chance and necessity—the blind watchmaker. His is clearly a conclusion that is supported as much by his philosophical preconception as by the data he has selected to support it.

Obviously, the most common argument against ID is the evidence mustered to support evolution. Generally, that includes the following observations:

1) Fossils exist. This proves that over the earth's history a wide variety of life forms existed, and those appearing later seem to be more complex than earlier forms;

2) Darwin's process of natural selection can be observed in nature where the sick, weak, and old are culled from populations as the fleet and agile survive;

3) Bacteria raised in the presence of certain poisons (antibiotics) can, via changes in their DNA (and thus in their proteins), lose sensitivity to these toxins and survive;

4) Many plants and animals have been selectively bred by humans so as to change their DNA structure and their physical form. Thus, life forms are not immutable (as was the reigning view in Darwin's day) and can (at least under the direction of an intelligent agent) change; and

5) There are striking similarities in the bodily forms, and especially the molecules of life, across species of plants and animals suggesting common ancestors.

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[57]Ten classic textbook "proofs" of Darwinian evolution including the Peppered Moth, Haekel's embryos, Darwin's Tree of Life, the Miller-Urey chemicals-to-life experiments, etc., are scientifically critiqued by Jonathan Wells, *Icons of Evolution: Science or Myth* (Washington, D.C.: Regnery Publishing, Inc., 2000).

[58]"All appearances to the contrary, the only watchmaker in nature is the blind forces of physics, albeit deployed in a very special way. A true watchmaker has foresight: he designs his cogs and springs and plans their interconnections, with a future purpose in his mind's eye. Natural selection, the blind, unconscious, automatic process which Darwin discovered, and which we now know is the explanation for the existence and apparently purposeful form of all life, has no purpose at all." Dawkins, *The Blind Watchmaker*, 5.

In addition, naturalists would add to this list the fact that no one has ever "seen the designer" implied by ID theory. Therefore there is no evidence for design. But no one has "seen" the designers of Stonehenge, and yet we have no doubt that this ring of rocks in southern England was intelligently designed. Furthermore, we cannot presently observe the working of a mindless evolutionary process in the production of the first form of life and its many subsequent variations, so, the "we cannot see the designer" argument is weak. However, in making this argument, the Darwinists do acknowledge the utility of a logical construct central to scientific discovery: for data to count as support for theory A, it must not only be consistent with theory A, but it must also be *inconsistent* with competing theory B. In point of fact, virtually all of the observations used to support Darwinism also support ID theory thus they cannot prove either (see below). Because this fact is not disclosed to the public or to school children, we are left with the mistaken impression that Darwinism is well-supported, indeed, it is a "fact." Telling only half the story transforms education into indoctrination.

Darwin was quite successful in disabusing the scientific community of the false concept of the "immutability of species" because he showed that animals could be changed (at least somewhat). This was not a new idea, since people had been selectively breeding animals for centuries. What was new was Darwin's idea of *limitless* variability, which led to the proposition that all life arose from a common ancestor by natural selection acting upon random variation.[59] These assumptions involved colossal leaps of faith reaching far beyond the data. Nevertheless, his logic was compelling to a nineteenth-century audience eager to be freed from the suffocating strictures of religious domination. The Church's authority was ultimately based on the existence of a Creator, and that existence was "proven" by the living world itself.[60] But if Darwin was right, then the tyranny of that evidence ceased because "science" had shown the Bible to be wrong.

While there is no need to elaborate further on these supporting pillars of the naturalistic hypothesis (as our culture is inundated with them daily, from textbooks to TV), there is a need to point out that naturalism has been *unsuccessful* in explaining several crucial "natural" phenomena: the origin of the universe, the origin of universal laws and constants, the origin of life, and the origin of irreducible complexity. Naturalistic scientists naturally see these as only temporary inconveniences as they note that the history of science is replete with examples of once-mysterious events finally being explained "naturally." While this is clearly true, it must be recalled that

[59]"I can see no limit to the amount of change … [to] organic beings … which may have been effected in the long course of time through nature's power of selection." Darwin, *Origin of Species*, 114.

Darwin wrote that the facts "proclaim so plainly that the innumerable species; genera and families, with which this world is peopled, are all descended, each within its own class or group, from common parents, and have all been modified in the course of descent, that I should without hesitation adopt this view even if it were unsupported by other facts and arguments." Ibid., 457.

[60]See note 30 above.

these advancements have been made in the arena of *empirical* or *experimental* science where experimental tests can be conducted in real time and relevant variables can be well-controlled. They have also been conducted within a framework that encourages thinking outside the box. Methodological naturalism restricts free thought about origins.

Is ID a "Science Stopper" or a "God of the Gaps" Theory?

Its critics have so complained.[61] Did the discovery that the earth was round "stop science?" How about the germ theory of disease, or the fact that gold cannot be created from lead? Did these discoveries halt scientific progress? These were discoveries of the *truth*, and therefore they did, in a sense, "stop" scientific inquiry. They stopped it for the same reason that you stop looking for your car keys when you find them. There is no need for further investigation. Why are we not still funding research on how to prevent polio or how to make a horseless carriage? Because we know the answers. If ID theory is true and life and its diversity *did* arise by the action of an unknown intelligent agent, then the only "intelligent" response is to take it as a given (like gravity), stop trying to prove the counter argument, and intensify research efforts into the discovery of how life *works*, not where it came from. In the area of genetics, for example, let us try to determine just how "plastic" the genome is. What are the natural limits of variability, and how far can those limits be extended by intelligent manipulation of genes? Can we turn a squirrel into a chipmunk by gene insertion/deletion? Can we cure genetic diseases? It is questions like these that will lead to fruitful discoveries and thus deserve our full attention. It is a shame, in our view, to continue to lavish precious resources (money and careers) on the quest to determine how "evolution created us" when the underlying assumption (i.e., that it *did*) may be false.

Limiting science to a predetermined set of acceptable explanations naturally begs the question, "What if there *is* no natural explanation?" What if, in fact, an intelligent agent *was* responsible for DNA, etc.? Science would forever miss it and would continue to squander intellectual and financial capital on finding naturalistic answers that do not exist. Scientific progress depends heavily upon discovering blind alleys and rejecting failed theories. This is simply the way that science works, and thus, ID theory should be seen as invigorating, not stifling, scientific investigation. For example, the recent publication of a computer simulation purportedly explaining how life could have evolved without intelligent input was stimulated by the scientific challenge of an opposing theory, ID.[62]

Is ID a "god of the gaps" theory? The charge has been made that ID proposes design for whatever cannot be explained by law and chance. Hence all gaps in our

[61]"According to [Eugenie] Scott of the National Center of Science Education, design theorists say, ' 'Well, gee, I can't understand it. Therefore I'm saying God did it' ... and once you say God did it, you stop looking for a natural cause. It's what we call a science stopper.'" Nina Shapiro, "The New Creationists: Seattle's Discovery Institute Leads a National Movement Challenging Darwinism," *Seattle Weekly*, April 19–25, 2001.

[62]Lenski et al., "Evolutionary Origin."

knowledge are filled by design—by God. That is simply not the case. A design inference can be falsified simply by showing a lack of any apparent design or meaning in the pattern, or by demonstrating (not imagining) that unguided natural processes can produce the pattern or object in question. Every day the SETI researchers evaluate radio waves for hidden messages (designs) and have yet to find a single case. On the other hand, without design as a competing hypothesis, a naturalistic explanation is effectively a "chance of the gaps" or "environment of the gaps" explanation. Anything we cannot explain by law and chance today will be explained by law and chance tomorrow, when we find such a law or some way to inflate our probabilistic resources (like positing infinite parallel universes). There must be such a law and chance explanation because that is the only one allowed.

Is ID a science stopper? No. The real science stopper is methodological naturalism which rules out design as a matter of philosophy.[63]

Is ID Religion and Not Science?

An application of the scientific method to the question of origins should make it clear that ID is science. A design inference veritably leaps from the data, not from a religious text. This is evident from the history of the debate itself. As explained by Richard Dawkins, Darwin's theory was developed as a counter argument to the reigning belief in his day that living systems appeared to be designed.[64] If it is scientific for Darwin (and Dawkins) to argue *against* design, then it is scientific to disagree. Design theory is clearly consistent with traditional definitions of science that hold it to be a search for "general truths"[65]

Science organizations and others have raised a number of objections to design theory that seek to gerrymander it out of science and leave evolution with a monopoly on origins explanations. One argument is that design theory is not testable

[63]Demarcation criteria (i.e., characteristics that reliably distinguish real from pseudoscience) have been highly criticized by highly regarded philosophers of science. Larry Laudan, "Science at the Bar: Causes for Concern," in Michael Ruse, ed., *But Is It Science?* (Buffalo, N.Y.: Prometheus Books, 1988), 351–355; Philip Quinn, "The Philosopher of Science as Expert Witness," in ibid., 367–385; David K. DeWolf, Stephen C. Meyer, and Mark E. DeForest, "Teaching the Origins Controversy: Science or Religion or Speech," *Utah Law Review* 39.1 (2000): 68–75.

[64]Richard Dawkins, *The Blind Watchmaker*, 6.

[65] "Science is the search for truth, the effort to understand the world; it involves the rejection of bias, of dogma, of revelation, but not the rejection of morality. One way in which scientists work is by observing the world, making note of phenomena, and analyzing them." Barbara Marinacci, "Linus Pauling: Scientist for the Ages," quoting Linus Pauling, The Linus Pauling Institute website [http://lpi.oregonstate.edu/lpbio/lpbio2.html] (July 11, 2003). "Science … accumulated and accepted knowledge that has been systematized and formulated with reference to the discovery of general truths or the operation of general laws: knowledge classified and made available in work, life, or the search for truth: comprehensive, profound, or philosophical knowledge; especially knowledge obtained and tested through the use of the scientific method." Webster's Third New International Dictionary of the English Language, unabridged (1993).

and has no predictive power. As explained above, an inference of design may be tested by the same forensic techniques used in all historical sciences. A good example is the SETI program. Furthermore, evolutionary theories must be contrasted and weighed against a competing theory, hence, ID theory is a necessary part of origins science.

Some claim that design theory makes no predictions and therefore is not scientific. It should first be noted that part of the very definition of *evolution* is that it is unpredictable.[66] Design theory does, in fact, make predictions. For example, it predicts that the genome was designed for a purpose and that a function would be found for what had been called "junk DNA." This prediction has recently been corroborated.[67] ID assumes that biological systems are the product of intention rather than just luck and law. This prediction is used daily as biochemists seek to "reverse engineer" biochemical machines, that is, to take apart such systems in search of the "design decisions" that were built into their architecture. William Harvey used design theory to discover how blood circulated based on the structure of heart, veins and arteries. Such objections to design are nothing more than lame excuses fashioned, not to enhance our knowledge about origins, but to gerrymander design theory out of the discussion, to suppress any scientific evidence that would support belief in an intelligence designer.

Is ID religion? Not at all. It is merely a logical inference drawn from objective data that does not derive from any religious text. Perhaps most importantly, ID theory is not religion because it is a *tentative* hypothesis and not a doctrine (like methodological naturalism) which requires belief and acceptance. The design hypothesis does not require that it be taken for granted. A key requirement of any "religion" (for Establishment Clause purposes) is that it be a belief system.[68] Although design theory and evolution, *as theories or hypotheses*, address issues important to religion, the Supreme Court has held that the implications of material alone do not make a religion even though those implications "coincide or harmonize with the tenets of some or all religions."[69] Furthermore, a design inference does not seek to advance a particular religious belief system and does not have a clergy, a set of ethics and morals, religious texts or any of the other trappings of recognized religions.

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[66]National Association of Biology Teachers, see note 4 above.

[67]S. Hirotsune. et al., "An Expressed Pseudogene Regulates the Messenger-RNA Stability of Its Homologous Coding Gene," *Nature* 423.6935 (May 1, 2003): 91–96.

[68]*Alvarado v. City of San Jose*, 94 F3d 1223, 1229 (9th Cir. 1996), where the court formulated the following definition of religion: "First, a religion addresses fundamental and ultimate questions having to do with deep and imponderable matters. Second, a religion is comprehensive in nature; *it consists of a belief-system as opposed to an isolated teaching*. Third, a religion often can be recognized by the presence of certain formal and external signs."

[69]*Edwards v. Aguillard***,** 482 U.S. 578, 605 (1987); *Alvarado v. City of San Jose*, 94 F3d 1223, 1232, and *Fleischfresser v. Directors of School District 200*, 15 F3rd 680, 689 (7th Cir. 1994).

Evidence Supporting Both Proves Neither

There is not only evidence favoring each theory, much of the evidence supports both (and therefore proves neither).

Adaptation and Natural Selection

There is no disagreement that small, adaptive changes can occur within species in response to environmental forces. The difference is that Darwinists claim that there is *no limit* to what this variation can produce, whereas ID proposes (from solid experimental evidence, in our view) that there *are* in fact limits. In addition, the grand claims for both (i.e., the appearance of novel, complex biochemical systems leading to "new" types of animals) have never been directly observed. For ID theorists this is because individual "designing events" are singularities—unique, one-time occurrences that took place in the far distant past (as with the Big Bang theory). Darwinism's claim that new species arose from very gradual changes from older species is not observable either because the process is so slow that no one can live long enough to see it happen or because we have yet to fully understand the biochemistry which actually is the source of change. Accordingly, both theories rely upon indirect evidence.

ID theorists point to the presence of information in biological systems as indirect evidence of the activity of a past designing intelligence. For Darwinists, the example of "Darwin's finches" in the Galapagos Islands is highly touted.[70] In this story, the average size of finch beaks was observed to increase in dry seasons. This was heralded as compelling proof that if environmental conditions were right, a new species of finches would appear "in about two hundred years." This conclusion becomes somewhat less compelling when the reader is told the whole story, not just the half that fits with evolutionary theory. In fact, the average beak sizes reverted back towards "normal" in subsequent rainy seasons. This oscillation in average beak sizes of the population is not a process by which new animals are produced (or even new beaks, for that matter); it is a process that allows the species to thrive with changing environmental stresses. In the dry times, those finches with shorter, stouter beaks (that can crack the harder, dryer seeds) keep the species alive. In wet times, plentiful soft seeds allow a greater variety of minor variations to survive. Built into the finch genome is the ability to vary in response to environmental pressures, but again, only within limits. This tendency of the Darwinist to uncritically accept tiny observed changes (microevolution, which is well accepted) and to then extrapolate (wildly, in our view) to "macro"-evolutionary conclusions is problematic. It is like concluding that humans reached the New World by leaping across the Atlantic Ocean based on the very precise, reproducible, and highly quantitative scientific observation that a man can jump over a three-foot creek. It is stories like that of the Galapagos finches that illustrate why schools should teach more about evolution, not less. All of the evidence is far less compelling than filtered bits and pieces.

[70]Jonathan Weiner, *The Beak of the Finch: A Story of Evolution in Our Time* (New York: Vintage Books, 1991).

Molecular and Anatomic Similarities between Species

DNA is found in all life forms (except some viruses which are not "alive" in the strictest sense). Proteins are made of amino acids (virtually the same twenty) in all life forms, and proteins can be very similar in bacteria and humans. Does this prove ancestral relationship, or does it suggest a common designer? Either is theoretically possible. One can find bolts in automobiles, airplanes, air conditioners, and armoires. Is this because these objects "evolved" from each other or because a designer used a similar part to solve a similar problem in multiple unrelated creations? ID theory easily accommodates the existence of similar molecular (and anatomic, e.g., limbs, eyes, etc.) forms across species by hypothesizing a common designer.

"Evolution Observed"—Antibiotic and Pesticide Resistance

How does ID theory view the clear examples of the appearance of "new" bacteria or mosquitoes that can survive in environments deadly to "normal" organisms? Is this not definitive proof of Darwin's theory? Before noting the ID perspective on these observations, at least two points should be made. First, a bacterium or insect that has immunity to a toxin is still the same bacterium or insect; it is not a new life form or a new species. Nothing new has been "created." Second, these organisms did not "gain" resistance; they "lost" sensitivity. They contain mutated or damaged proteins that *fail* to bind to or *fail* to take up toxic chemicals that would cause normal varieties to die. So no new ability was gained; normal function was lost. This evidence is also consistent with a design prediction that the immune system was designed—like any machine—with anticipated adaptability and built-in tolerances. It has been noted that the immune system has a mutation rate thousands of times faster than the rate in other parts of the genome, and that absent this high mutation rate, it would not be able to effectively adapt to a variety of new threats to the system. This suggests that the very source of change that drives microevolution is not random at all, but designed. These are examples of planned flexibility which can respond, in a limited way, to changing environments.

Bioethical Implications of Origins Theories

Did God create us or did we create God? Do we have *inherent* purpose or are we free to define our own purpose? The answers to these questions are key to any discussion of ethics. The late Professor William Provine helps us understand the deeper implications of a naturalistic, materialistic, and Darwinian worldview.

> First, modern science directly implies that the world is organized strictly in accordance with mechanistic principles. There are no purposive principles whatsoever in nature. There are no gods and no designing forces that are rationally detectable. Second, modern science directly implies that there are no inherent moral or ethical laws, no absolute guiding principles for human society…. The conflict between science and religion is to the extent that persons who manage to retain religious beliefs while accepting evolutionary biology have to check their brains at the church-house door.[71]

[71]William Provine, "Evolution and the Foundation of Ethics," *MBL Science* 3.1 (1988): 25–29.

Is Provine right or wrong? If one takes for granted that natural phenomena are not designed, he is logically correct. That is because purpose only derives from a mind that has the capacity to arrange future events for a purpose. Law and chance simply do not have the capacity to contemplate the future and aim at a goal.

Accordingly, a Darwinian or evolutionary worldview has profound ethical implications that are diametrically opposed to those flowing from a theistic worldview. Ethical decisions dramatically depend on whether we are or are not designed for a purpose. For example, we have a natural reluctance to act contrary to the plans and purposes of another mind absent a rational and reasonable justification. A land developer who discovers an ordered assemblage of stones in a field that appears to be an ancient graveyard would pause and reflect before he moved them. He would at least consider the implications before he violated the clear intentions and purposes of an ancient civilization. But if the stones were simply strewn willy-nilly across the field due to a flood or avalanche, he would without a thought bulldoze them into a ditch.

Similarly, if life is an accident, why not alter it to suits our needs? If we can, why not make human clones? Why not abort unwanted children? Why not euthanize the "useless" aged? Why not end a challenging marriage? Why not cheat on our taxes? Why not "steal, kill, and destroy?" Ordinary people intuitively recognize that with no overarching, inherent purpose in life, anything that is consistent with the purposes created in our own minds is acceptable. "If there is no God, all things are permissible."[72] However, if (and there is no bigger if) life is not just an accident or occurrence, but is something that has been designed and made, then life must have an inherent purpose. If purpose pervades life, then we pursue actions contrary to that purpose at our peril. Manipulating our genes to produce "designer humans" may conflict with an intended but currently unknown purpose of standard procreation and may result in disasters unimaginable. How extensively should we tinker with life when we do not know its intended purpose?

The bioethical implications of ID are clear, not only for individuals, but for culture as well. Who will tell us whether we should clone humans, traffic in human organs, inflict capital punishment? Who will sit at the head of the cultural table? Who is even allowed at the table? Naturalistic science tells us that it will provide the "facts," and it will tolerate theologians and philosophers as they opine about purpose and meaning. But materialistic science has already concluded that there is no inherent purpose in life, so what true role remains for religion? Why give any credence to individuals who have deluded themselves into the false notion that life has purpose? They are like the couple that must be invited to the party for political reasons but whose quaint views are ignored. What if life really is designed and truly has purpose? What then for science? If so, then religion not only deserves a place at the table, it may deserve to be at the head.

[72]Fyodor Dostoevsky, *The Brothers Karamazov* (Cutchogue, NY: Buccaneer Books, 1996).