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## INTELLIGENT DESIGN

By Dan W. Reynolds, PhD

The phrase “intelligent design” is heard a great deal lately in the media, usually in the context of secondary school science education. Recent efforts to have intelligent design even mentioned in high school biology classes have been met with defeat in the courts. A 2005 Harris Poll<sup>1</sup> showed 64% of Americans believe human beings were created directly by God. Concerning what to teach, the same poll showed that 12% favored evolution only (the current practice), 23% favored creation only, 4% favored intelligent design only, and 55% favored the teaching of all three; a total of 82% thought creation or intelligent design should be taught. Despite this, school boards that would challenge Darwinism in the classroom seem powerless to influence the content of science curriculum. Sadly, the scientific establishment, with help from the American Civil Liberties Union, has resorted to enforcing the teaching of its naturalistic view of origins on schools districts by legal decree instead of open dialog, honest scientific debate, and persuasion. But these tactics, while successful in the courts, have not won Darwinism many new subscribers. The Harris poll showed that public opinion moved toward the creation viewpoint between 1994 and 2005. A phone survey conducted by Zogby International in February of 2006 found that 69% of respondents thought the evidence for and against evolution should be taught, and 77% agreed that “students should also be able to learn about scientific evidence that points to an intelligent design of life.”<sup>2</sup> Many scientists lament this state of affairs and believe the “problem” stems from a lack of educating the public about science. Many in the scientific community feel there is no conflict between faith and evolution, that evolution is neutral about God. Many Catholics (including the Pope) adopt this view. Nevertheless, the scientific community is much less likely to believe in a personal



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God than the general population, as a 1998 poll of members of the National Academy of Sciences has shown:

The follow-up study [of scientists] reported in *Nature* [a scientific journal] reveals that the rate of belief [in God] is lower than eight decades ago. The latest survey involved 517 members of the National Academy of Sciences; half replied. When queried about belief in “personal god,” only 7% responded in the affirmative, while 72.2% expressed “personal disbelief,” and 20.8% expressed “doubt or agnosticism.”<sup>3</sup>

Interestingly, those heavily indoctrinated in naturalistic evolutionary theory are also very likely to disbelieve in a personal God, bringing into question evolution's alleged theological neutrality.

Some scientists fear that intelligent design, if given full respectability, would stifle technological progress and

<sup>1</sup> The Harris Poll® #52, July 6, 2005: Nearly Two-thirds of U.S. Adults Believe Human Beings Were Created by God, [http://www.harrisinteractive.com/harris\\_poll/index.asp?PID=581](http://www.harrisinteractive.com/harris_poll/index.asp?PID=581). Other polls have given similar results: 204 CBS Poll: <http://www.cbsnews.com/stories/2004/11/22/opinion/polls/main657083.shtml>

<sup>2</sup> This item is available on the Apologetics Press website at: <http://www.apologeticspress.org/articles/2875>.

<sup>3</sup> New Survey: Scientists “More Likely Than Ever to Reject God Belief” at <http://www.atheists.org/flash.line/atheism1.htm>; <http://www.stephenjaygould.org/ctrl/news/file002.html>

bring economic decline. Ironically, these scientists overlook the fact that most of modern science emerged from the Judea/Christian worldview. But for many ordinary citizens and scientists, Darwinian evolution itself has strong religious and metaphysical implications: it implies that if God exists, He has not played an active role in the universe. Some feel that the philosophical materialism implied by Darwinian evolution has led to the moral decline in the West. Many feel that evolution is not supported by the evidence nearly as well as claimed, that biology textbooks misrepresent data, that there is much evidence in the mainstream scientific literature that contradicts evolution, and this evidence should be taught openly in science class.

### **What is Intelligent Design Theory?**

What exactly is intelligent design theory? How does it differ from creation science? What are the goals and history of the Intelligent Design (ID) movement? What are the scientific arguments made by ID? What does ID have to say about science in general and evolution in particular? How do ID proponents respond to their critics? What are the legal arguments made by supporters and detractors of ID? Should it be taught in high school? What are the philosophical and moral issues concerning evolution? These and related questions will be explored in this essay.

Intelligent Design is a *scientific theory* that claims intelligent causes are the best explanation for some phenomena in nature, especially in biology and cosmology. However, ID is not merely a god-of-the-gaps theory that focuses on the current lack of naturalistic explanations for phenomena, but has developed ways to *empirically detect design*. ID starts with observation, applies inductive and deductive reasoning, and then makes inferences to the best explanation. Creation Science<sup>4</sup> or creationism, in contrast, starts with revelation found in the Bible and then looks for evidence and formulates hypotheses that are consistent with scripture and science. ID has religious implications but is not based on religious premises. ID does not identify the intelligent designer or even necessarily say that the designer is supernatural. ID does not focus on the age of the earth, Noah's Flood, the origin of death, or other creation issues, nor is it exclusively a Christian movement. Most of the leaders in the ID movement accept the Big Bang theory, the standard geological history of the earth, descent with modification, and common ancestry. Many believe (or do not object to the idea that) God guided an evolutionary process to create life. What they don't accept is that there are adequate naturalistic ex-

planations for the fine tuning of the physical constants in nature, the origin of life, the Cambrian explosion in the fossil record, Darwinian molecules-to-man evolution (macroevolution), the information found in DNA and proteins, and the formation of complex molecular machines found in the cell. These phenomena, they assert, are best explained by intelligent causes.

ID proponents think that the evidence for and against the theory of evolution should be taught in public schools and that science needs to be expanded to allow intelligent causes. It is believed that this approach to science education could enhance the development of critical thinking skills in students better than the present indoctrination into naturalistic dogma. ID proponents assert that we should "teach the controversy" (of course, many in the scientific community deny that there even is a controversy). Many in the ID movement believe that science is due for a revolution in its basic assumptions. For the past few centuries, science has conceived the physical universe in terms of matter and energy. With the discoveries in molecular biology over the last half century, it has become apparent that information is also present in nature, and that the properties of matter and energy alone may be inadequate to account for the origin of this information. ID contends that the best explanation for the information found in biology is intelligence. ID believes that science should go wherever the evidence leads, seeking the truth, and not be artificially limited to natural causes where these are found inadequate. ID proponent, philosopher, and mathematician William Dembski has written:

The basic concepts with which science has operated these last several hundred years are no longer adequate, certainly not in an information age, certainly not in an age where design is empirically detectable. Science faces a crisis of basic concepts. The way out of this crisis is to expand science to include design. To reinstate design within science is to liberate science, freeing it from restrictions that were always arbitrary and now have become intolerable.<sup>5</sup>

ID asserts that intelligently designed objects possess a measurable and quantifiable property called specified complexity. Specified complexity puts the detection of design within science. Expanding science to include intelligent causes will enhance science by inspiring inquiry into function where none was previously suspected. For example, many human organs, once considered the left over and useless remnants of evolutionary ancestors, have been found to have significant function; the assumption of intelligent design would have led to the discovery of these functions sooner. If humans were de-

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<sup>4</sup> I am personally a supporter of young earth creation science and ID. Discussions in this essay involving millions and billions of years are made for argument's sake only.

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<sup>5</sup> Dembski, William A. (1999) *Intelligent Design*, Intervarsity Press, Downers Grove, IL, 152

signed by an intelligence, there may be some built-in psychosocial constraints that if violated would cause us harm and suffering. For example, if we were designed for sexual fidelity but practice promiscuity, there may be some natural negative consequences because we are operating outside of our design specifications. The assumption of design in nature leads to a reverse engineering approach to understanding the operation, purpose, and function of the components of biological systems. With a “what problems has this design solved?” approach, scientists may find technological applications for society.

### **A Brief History of Intelligent Design**

Thomas Woodward, a professor at Trinity College in Florida, has written about the history of the modern ID movement in his recent book *Doubts About Darwin*.<sup>6</sup> He traces the major events, ideas, writings, and people in the history of ID while focusing on the rhetorical strategies of ID proponents and Darwinists. The book is an extension of Woodward’s Ph.D. thesis. Some of the book’s highlights are listed below:

- The ID movement is examined in light of Thomas Kuhn’s scientific revolution-paradigm shift hypothesis.<sup>7</sup> Kuhn’s theory on the progression of scientific revolutions follows a temporal sequence: science as usual (accepted paradigm), accumulation of anomalies (facts that don’t fit the accepted paradigm), paradigm crisis, paradigm shift, revolution, science as usual (reign of new paradigm). Woodward believes ID has the potential to be one of the greatest revolutions in the history of science. Design has already gained acceptance from the media and the public (polls). Woodward maintains that “if any group, religious or scientific, gains the authority to present its own story as uniquely true and to label other stories as mythological, this group functions as the high priesthood of our time.”<sup>8</sup> The infallibility of the priesthood is maintained until revolution. At present, the leaders of the materialistic scientific establishment are the “high priesthood.” ID leaders are angry about the misrepresentation of what science really knows about origins (omits discussion of anomalies). Kuhn’s ideas allow Darwinism to be seen as a passing phase rather than the final paradigm.

- Michael Denton, author of *Evolution: A Theory in Crisis*,<sup>9</sup> is credited for starting the modern Design movement.
- Denton’s writings awakened Phillip Johnson and Michael Behe (prominent ID leaders today) from “dogmatic slumber.” Denton also influenced William Dembski and others.
- ID critiques evolutionary biology and also lays the groundwork for a new paradigm in science, which includes intelligent causes.
- ID is founded primarily on intellectual, not religious, grounds.
- ID is unhappy about poor science in textbooks, unfair teaching practices, and forced indoctrination of students into materialist philosophy.

A few of the major figures in the modern ID movement will be discussed here including Michael Denton, Philip Johnson, Michael Behe, William Dembski, and Charles Thaxton.

Several leaders in the ID movement credit their inspiration to Michael Denton, an agnostic Australian naturalist and author of the book *Evolution: A Theory in Crisis*.<sup>9</sup> Denton showed how many of the facts of biochemistry differ from Darwinian predictions. He concluded science has embraced evolution, not because the evidence demands it, but because it’s the only naturalistic explanation available. Thus it is the philosophical commitment to naturalism, not evidence, that gives priority to the evolutionary paradigm. That this is the case is exemplified by the words of Harvard biologist Richard Lewontin:

“We [the scientific establishment] 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 unsubstantiated 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.... To appeal to an omnipotent deity is to allow that at any moment the regularities

<sup>6</sup> Woodward, Thomas (2003) *Doubts about Darwin: A History of Intelligent Design*, Baker Books, North Dartmouth, MA

<sup>7</sup> Kuhn, Thomas (1970) *The Structure of Scientific Revolutions, Second Edition*, University of Chicago Press, Chicago, IL

<sup>8</sup> *Ibid.*, 31

<sup>9</sup> Denton, Michael (1986) *Evolution: A Theory in Crisis*, Adler & Adler Publishers, Inc., Chevy Chase, MD

of nature may be ruptured, then miracles may happen."<sup>10</sup>

This candid admission from one of the world's most renowned evolutionary biologists is striking. Lewontin is saying that philosophical bias, not evidence, is the basis for insisting on materialistic explanations. Ironically, the evolutionary establishment has long claimed that the ID movement is merely pseudo-science unsupported by a shred of evidence, "creationism in a cheap tuxedo", religion masquerading as science, "creationism lite," etc.

Denton's book started the modern ID movement. He showed how macroevolution is not supported by the evidence. The extrapolation of microevolution to macroevolution is unwarranted. Macroevolution is not supported by fossils or the molecular evidence. There is no natural explanation for the origin of life. There is no evidence for transitional form in the fossil record. Evolution is believed because of the "priority of the paradigm."

Denton retold the history of science—he said the rise of Darwinism was like a type of Dark Ages. Darwin was honest about the lack of evidence in the fossil record. However, his theory hardened into axiom even though the evidentiary problems remained. Natural history was assumed to be caused exclusively by chemistry and physics. The facts have not changed since Darwin, only what is considered intellectually fashionable. Denton focused on gaps in the fossil record. He asked if there is evidence the gaps have ever been crossed. He questioned if intermediates could even be conceived in thought experiments. Darwin predicted continuity in the fossil record, discontinuity is reality. Denton cited several transitions which defy evolutionary explanation: reptilian scales to bird feathers, reptilian lung to bird lung, etc. Denton's book has been very influential but misunderstood by some as arguing for God—he rejects both creation and Darwinian evolution but offers no alternative. Denton says empiricism leads to rejection of Darwinism. Denton set the stage for the types of arguments others would later use against Darwinism.

Denton's ideas were readily absorbed by Phillip Johnson. Johnson, a Christian law professor (University of California, Berkeley), read Denton's book and the book *The Blind Watchmaker*<sup>11</sup> by atheist, biologist Richard Dawkins during a sabbatical in London in 1987-88. Johnson became convinced by Denton that Darwinism is a myth. Johnson, "awakened from his dogmatic slumber",

was inspired to write *Darwin on Trial*.<sup>12</sup> The main thesis of the book was that Darwinism is not empirically driven but based on metaphysical naturalism, a philosophy which holds that the universe is reducible to natural causes. Johnson has been long considered the leader of the ID movement. He has successfully debated several leading evolutionists including the late Harvard paleontologist Stephen J. Gould. Johnson's goal was to expose Darwinism as pseudoscience. Johnson had four theses in *Darwin on Trial*: (1) Biology and the fossil record tend to falsify macroevolution and the chemical origin of life. (2) Macroevolution is based on metaphysical naturalism, not empirical evidence. Macroevolution must be true by default since there is no other naturalistic explanation and science has been defined to exclude any non-naturalistic causes. The evidence is then built upon this pre-existing theoretical certainty based on the supposition of naturalism. (3) When questioned, Darwinism is protected by empty labels, semantic manipulation, faulty logic, and well-crafted definitions, but not by evidence. Evolutionists play a semantic shell game, they prove a modest claim of evolutionary theory then use that proof as evidence for the entire metaphysical scheme: microevolution (variation within a species) is true, therefore so is macroevolution (molecules to man evolution). In this way the "fact" of evolution can go unquestioned. (4) Darwinism is the central cosmological myth of modern science and culture. Johnson believes Darwinism is a quasi-religious system that is known *a priori* to be true without being subject to rigorous scientific testing. Johnson wanted to incite a paradigm crisis and shift back to theism. He wanted to legitimize criticizing Darwin so like minded scientists could step in and finish the job.

Johnson devised a Wedge Strategy for reinstating theism: Johnson is the thin edge, exposing Darwinism as metaphysical naturalism masquerading as fact, and the ID scientists then widen the cracks in Darwinism's foundation. Johnson wants to open up universities to the possibility that naturalism might not be true. Design just wants a seat at the table, not to destroy or hurt science. Johnson wants theism to be a respectable intellectual starting point at the university.

Michael Behe, a catholic and Lehigh University professor of biochemistry, read Denton and Johnson. He became angry at the deception in biology texts, that evolution was overwhelmingly supported by evidence and an established fact. He has become a strong advocate for ID. Behe is an insider in the scientific establishment; he is a tenured professor at a respected university and has much credibility. Behe has participated in debates in person and on-line. His now famous book *Darwin's Black*

<sup>10</sup> Lewontin, Richard (1997) Billions and Billions of Demons. *New York Review of Books* 44(1)

<sup>11</sup> Dawkins, Richard (1986) *The Blind Watchmaker*, Harlow Longman, Essex

<sup>12</sup> Johnson, Phillip E. (1993) *Darwin on Trial*, Intervarsity Press, Downers Grove, IL

Box,<sup>13</sup> in which he introduced the concept of irreducible complexity (discussed later), has been very successful and influential since its publication in 1996. His book has received much attention both pro and con. The book has been mentioned in *Newsweek*, *The Wall Street Journal*, *National Review*, *Nature*, and others; has had over 100 reviews; has been translated into over 15 languages; and sold 40,000 copies the first year and 20,000 per year thereafter. Behe says he is not a creationist. He accepts standard geology and descent from a common ancestor. He (and chemist Charles Thaxton) argued positively that design was a legitimate alternative explanation for anomalies that could not be explained by Darwinism. He reasoned that since cosmology and astronomy were open to design, it was time for biology to join in. He believes the evidence can only detect design, not the identity of a designer. The inference to design does not require a candidate for the designer. Behe pointed out that as of 1996, the scientific literature contained essentially no detailed biochemical explanations for how complex molecular machines could have evolved by a Darwinian mechanism. Behe has emerged as a powerful spokesman for design.

William Dembski, who holds PhDs in mathematics and philosophy,<sup>14</sup> is currently Professor of Science and Theology at Southern Seminary in Louisville where he heads its Center for Theology and Science.<sup>15</sup> Dembski is the inventor of the explanatory filter for detecting design (more later). He is the author of *The Design Inference*<sup>16</sup> and *No Free Lunch*<sup>17</sup> among several other books. He has been called the Isaac Newton of information theory. Dembski says design is already a part of science in forensics, SETI (Search for Extraterrestrial Intelligence), archeology, cryptology, patent review, and data falsification analysis. The explanatory filter (EF) formalizes what science has already been doing. It facilitates the detection of design through measurement of information content. This EF is perhaps the most important contribution to science from the design camp.

Physical chemist Charles Thaxton, coauthor of the book *Mystery of Life's Origin*,<sup>18</sup> showed that despite an abun-

dance of energy, there is no natural mechanism to do the "configurational entropy work" needed to build complex biological molecules. He said DNA was evidence for a creator because it contained too much "specified complexity". He said that detection of design was scientific and empirical, even if the designer could not be identified. Thaxton, like Denton, is credited with being an early pioneer of the ID movement.

The Seattle based Discovery Institute's Center for Science and Culture<sup>19</sup> has been the flagship organization and home of the ID movement since 1996. The center has over 40 fellows and supports the development of intelligent design theory and the critique of materialistic science. The center also studies the impact of material science on culture and favors the teaching of the weaknesses and strengths of Darwinism in public schools. The fellows of the center have written numerous books and articles on ID. Many of the articles are available for free online.

*Continued on p. 6. See Intelligent Design*

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## COMING EVENTS

**Thursday, May 11, 7:00 P.M., Providence Baptist Church, 6339 Glenwood Ave., Raleigh**



Michelle Palmer, biochemistry student at NC State U. will speak on "Natural Selection: God's Creation". Michelle will help those who aren't biological scientists understand a little more about the complexity of life on a simple, yet still biochemical, level. Her main topics will include: What is DNA?, Complexity of Life,

Probabilities of Life (arising randomly), Mutations, Natural Selection vs. Evolution, and Irreducible Complexity. Michelle will also include the responses she has received from evolutionists about these topics.

Michelle will be leaving in the middle of May on a six-week mission to southeast Asia with a team of students led by the Navigators. Michelle and her team will be reaching out to university students, teaching English, and demonstrating Christ's love to those they encounter. Michelle is still seeking financial support for this effort. You can learn more about her mission by coming to our next TASC meeting or calling her at 828-320-8302.

most important chapters are available online at <http://www.idolphin.org/mystery/>

<sup>19</sup> <http://www.discovery.org/csc/>

<sup>13</sup> Behe, Michael J. (1996) *Darwin's Black Box: The Biochemical Challenge to Evolution*, The Free Press, New York, NY

<sup>14</sup> Dembski also has master degrees in statistics and theology and a BA in psychology.

<sup>15</sup> <http://www.discovery.org/csc/fellows.php>

<sup>16</sup> Dembski, William A. (1998) *The Design Inference*, Cambridge University Press, Cambridge

<sup>17</sup> Dembski, William A. (2001) *No Free Lunch*, Rowman & Littlefield Publishers, Inc., Lanham, MD

<sup>18</sup> Thaxton, Charles B., Bradley Walter L., Olsen Roger L. (1984) *The Mystery of Life's Origin: Reassessing Current Theories*, Philosophical Library, New York, NY. The three

Thursday, June 8, 7:00 P.M., Providence Baptist Church, 6339 Glenwood Ave., Raleigh  
Dan Reynolds, PhD will briefly discuss the history and main arguments of the Intelligent Design Movement.

## Intelligent Design (continued)

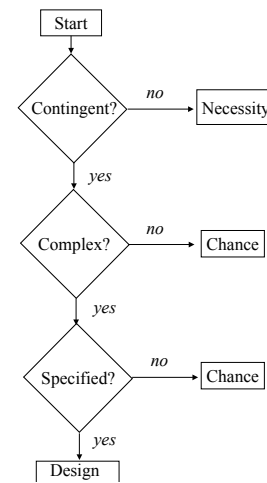
### Scientific Arguments of ID

As already discussed, science today has been limited by definition to a search for natural explanations. From a practical perspective, testing for material causes in the physical universe might seem the only empirical approach available; how does one test for non-material causes? This approach to the practice of science is called methodological naturalism. Methodological naturalism stands in contrast to the philosophical position known as metaphysical naturalism, which starts with the *a priori* assumption that natural causes are all that exist, that all phenomena reduce to chemistry and physics. Methodological naturalism necessarily follows from metaphysical naturalism, but the reverse is not true. Methodological naturalism admits there may be non-physical causes beyond its scope to observe. Metaphysical naturalism does not admit this possibility. The former is a practical approach to doing science, the latter is an all encompassing worldview. The ID movement seeks to enlarge the scope of science to include non-material yet empirically detectable intelligent causes. Science should be a search for the truth, not just material explanations, going wherever the evidence leads. Science should make inferences to the best explanations. What the ID movement offers science is reliable ways to empirically detect design and intelligent causes.

With the advent of the Information Age, scientists have learned how to measure information quantitatively in units called *bits*. In principle, the quantitative information content of any object or event, be it artificial or natural in origin, can be determined. Objects that contain information in the form of languages or codes (such as DNA) are most amenable to information measurement. Recently, intelligent design theorist William Dembski has proposed a method for detecting a type of information called *complex specified information* or CSI.<sup>20</sup> Where CSI is detected, intelligence is implicated. CSI makes design detectable and thus a part of empirical science.

Information must meet three criteria to be classified as CSI and therefore implicate intelligent design (see Figure 1).

Figure 1: The Explanatory Filter



First, the object or event must be *contingent*. An object or event is contingent if it does not have to happen. Throwing a normal die may result with the number 3 being on top, but it does not have to turn out that way; obtaining a result of 3 is therefore a contingent event. If the die had only 3s on its six sides, obtaining a result of 3 would not be contingent. Non-contingent events are determined by necessity or law instead of chance or design. Next, the object or event must be assessed for its *complexity* or likelihood of occurrence. The complexity of an event or object increases as its chance likelihood decreases. Events that are likely and simple can be attributed to chance alone without invoking law or design. If an object or event is highly unlikely and thus sufficiently complex (*i.e.*, if it contains  $\geq 500$  bits of information, see below), then one must determine if the information in the object is *specified*. An object or event is specified if its information is intelligible or recognizable as an independent pattern. For example, the phrase "ME THINKS IT IS LIKE A WEASEL" is specified because the string of letters and spaces is intelligible and recognized as a sentence in the English language. An equally long but random string of letters such as "EZC WJISMO QUNEE NHYXA IHSMLW" is as complex as the previous phrase but is not specified and hence is attributable to chance. Dembski calls his contingency, complexity, specification criteria for detecting design the Explanatory Filter. The filter does four things, it: (1) provides a strict procedure for the detection of design, (2) places design in context of currently accepted science, (3) uses statistical analysis, and (4) only detects intelligence, not the identity of the designer.

The minimum amount of information required to indicate design is called the Universal Complexity Bound (UCB) and is equivalent to 500 bits of information. This number comes from a determination of the maximum number of arrangements of matter that could ever exist

<sup>20</sup> Dembski, William A. (1999) *Intelligent Design*, Intervarsity Press, Downers Grove, IL

during the (alleged) history of the universe by chance processes. Dembski calculated the UCB by multiplying the number of particles in the universe ( $10^{80}$ ) times the estimated lifespan of the universe ( $10^{25}$  seconds)<sup>21</sup> times the speed of the fastest possible process ( $10^{45}$  events/second). This product,  $10^{150}$ , is equivalent to 500 bits of information. Hence a contingent event can be (1) simple and unspecified, or (2) complex and unspecified, or (3) specified but not complex, or (4) complex and specified. Only complex specified information exceeding the UCB indicates design.<sup>22</sup> As it turns out, the world of biochemistry is replete with molecules that exhibit CSI.

But naturalistic evolutionists claim that CSI *can* be generated by natural processes. Natural processes can be categorized as probabilistic (chance), deterministic (law), or a combination of law and chance (stochastic). In biology, the stochastic process of mutation acted upon by natural selection presumably accounts for macroevolution (bacteria to humans). Dembski argues that chance is too “dumb” to generate complexity (in a universe of finite age). He shows that law can only transmit information or shuffle it around but cannot generate *new* information.<sup>23</sup> Stochastic processes may generate simple specified information but not CSI. Hence, the Neo-Darwinian mechanism of mutation-selection is powerless to generate new CSI.

Some evolutionists believe evolutionary algorithms modeled *in silico* have demonstrated stochastic processes that are capable of generating CSI. One such algorithm started with a random string of letters such as “EZC WJISMO QUNEE NHYXA IHSMLW” and converted it into the target phrase “ME THINKS IT IS LIKE A WEASEL” in a just few dozen steps.<sup>24</sup> At each step, all the characters that were like those in the target phrase were retained, but all others were randomly changed. The new string of characters was again compared to the target phrase and all correct characters were retained. The process was repeated until the target phrase emerged. The reason that this evolutionary algorithm fails to generate new information is that the information it allegedly generates is actually built into the algorithm itself.<sup>25</sup> The target phrase was already a part of the algorithm. Instead of creating new information, this

algorithm merely shifted the information it already contained into the target phrase; nothing new was generated at all. Hence, for an evolutionary algorithm to be able to “generate information,” it must be supplied the information from an outside source. The No Free Lunch Theorems<sup>26</sup> state that evolutionary algorithms can only “generate” as much information as they already possess. In nature, natural selection can retain mutations that add survival/reproductive success value but is incapable of “guiding” the formation of new CSI in the DNA. Also note, from an evolutionary perspective, that each “generation” of phases would have to have “meaning” in order to survive into the next generation. Meaningless phrases would have no survival value and would not be selected. Yet smoothly interconverting meaningful sequences would be highly unlikely:

Since the 1960s, some biologists have thought functional proteins to be rare among the set of possible amino acid sequences. Some have used an analogy with human language to illustrate why this should be the case. Denton<sup>27</sup>, for example, has shown that meaningful words and sentences are extremely rare among the set of possible combinations of English letters, especially as sequence length grows. (The ratio of meaningful 12-letter words to 12-letter sequences is  $1/10^{14}$ , the ratio of 100-letter sentences to possible 100-letter strings is  $1/10^{100}$ .) **Further, Denton shows that most meaningful sentences are highly isolated from one another in the space of possible combinations, so that random substitutions of letters will, after a very few changes, inevitably degrade meaning.** Apart from a few closely clustered sentences accessible by random substitution, the overwhelming majority of meaningful sentences lie, probabilistically speaking, beyond the reach of random search (emphasis added).<sup>28</sup>

Information generation is constrained by *The Law of Conservation of Information* (LCI) which states information can be transmitted or degraded but not created by chance and natural processes (law).<sup>29</sup> Consequently, the information content of a closed system remains the same or decreases with time. The CSI of a closed system of natural causes (e.g. the universe) was either there eternally or added from an external source (i.e. the system

<sup>21</sup> Dembski accepts old earth/old universe ages. This duration is from the big bang until the heat death of the universe, estimated to be about a million trillion years.

<sup>22</sup> The explanatory filter used with the UCB is unlikely to give false positives but may give false negatives.

<sup>23</sup> This is true because events caused exclusively by physical law have a 100% chance of happening (probability of 1). Thus the amount of new information generated through the operation of physical law alone is  $I = -\log_2(1) = 0$ .

<sup>24</sup> Dembski, William (2002) *No Free Lunch*, Rowman and Littlefield, Lanham, MD, 180-184

<sup>25</sup> *Ibid.*, chapter 4

<sup>26</sup> *Ibid.*, 196, 203-204

<sup>27</sup> Denton (1986) 309-311

<sup>28</sup> Meyer, Stephen C. (2004) *Intelligent Design: The Origin of Biological Information and the Higher Taxonomic Categories* *Proceedings of the Biological Society of Washington*, 117(2): 213-239. Available online at <http://www.discovery.org/scripts/viewDB/index.php?command=view&id=2177>. This is the best article on the information problems for evolution I have seen.

<sup>29</sup> Dembski (1999) 170

was not always closed). Any closed system of natural causes of a finite duration received whatever CSI it contains before it became a closed system. Since the universe is a closed system of natural causes and of finite duration, the information seen in the biological world must have been present from the beginning and/or added at various times during its existence. Due to the LCI, evolutionists must explain how the information in DNA was present at the time of the Big Bang, was retained for billions of years in the matter and energy of the cosmos, and was finally translated into the genetic code. Clearly, the origin and mechanism of translation of information in such a naturalistic scenario are enigmatic. One evolutionist who has acknowledged this dilemma is information theory expert and evolutionist Hubert P. Yockey. According to Yockey,

The reason that a scientific explanation for the origin of life has not been found may be that the problem is intractable or indeterminate and beyond human reasoning powers. ...life is consistent with the laws of physics and chemistry but not derivable from them. We must...take life as an axiom...the time of the molecular biologist is better spent on understanding life as it is...having accepted the inexplicable axioms of these subjects.<sup>30</sup>

More evidence for design in nature comes from irreducibly complex biological systems.<sup>13</sup> A definition of irreducible complexity has been given by Dembski:

A system performing a given basic function is irreducibly complex if it includes a set of well matched, mutually interacting, nonarbitrarily individuated parts such that each part in the set is indispensable to maintaining the system's basic, and therefore original, function.<sup>31</sup>

An irreducibly complex system must have all its parts and each of its parts must be tailored to its function, or the system will not work. One biological system that is irreducibly complex is the bacterial flagellum, a rotating whip-like structure that propels bacteria through water. Laboratory experiments have demonstrated that the flagellum stops working upon removal of any of its parts.<sup>32</sup> The problem this poses for evolution is that a modified or incomplete version of the flagellum would be non-functional, would not add survival/reproductive success value, and therefore would not be retained by natural selection. In other words, if the flagellum will only work when fabricated correctly and with all its parts, what could have been its evolutionary precursor?

Any changes would render the flagellum inoperative and of no value to the organism. Evolutionists claim that parts of the flagellum are similar to other molecular machines in the cell and could have been co-opted from those sources to form the flagellum, thereby negating the need for non-functional precursors of the flagellum. However, just having the parts of the flagellum is not sufficient because the parts must be assembled in a particular order and at the right time by other molecular machines which themselves are manufactured as needed. Hence, the system that assembles the flagellum is itself irreducibly complex and necessary for the construction of the flagellum. For this reason, the theory of co-optation does not work.<sup>33</sup>

For example, there is a cellular subsystem called the type three secretory system (TTSS) that is simpler than the flagellum but has many of the same protein parts. Miller has claimed that the TTSS is an evolutionary intermediate of the flagellum. However, the evidence indicates otherwise, as University of Idaho microbiologist Scott Minnich explains:

To counter this argument (irreducible complexity), particularly as it applies to the flagellum, others have used the TTSS. Since the secretory system that forms part of the flagellar mechanism can also function separately. Miller has argued that natural selection could have 'co-opted' the functional parts from the TTSS and other earlier simple systems to produce the flagellar motor. And, indeed, the TTSS contains eighteen proteins that are also found in the forty-protein bacterial flagellar motor. Miller thus regards the virulence secretory pump of the *Yersinia* Yop system as a Darwinian intermediate, case closed. This argument seems only superficially plausible in light of some of the findings presented in this paper. First, if anything, TTSSs generate more complications than solutions to this question. As shown here, possessing multiple TTSSs causes interference. If not segregated, one or both systems are lost.

Additionally, the other thirty proteins in the flagellar motor (that are not present in the TTSS) are unique to the motor and are not found in any other living system. From whence, then, were these protein parts co-opted? Also, even if all the protein parts were somehow available to make a flagellar motor during the evolution of life, the parts would need to be assembled in the correct temporal sequence similar to the way an automobile is assembled in a factory. Yet, to choreograph the assembly of the parts of the flagellar motor, present-day bacteria need an elabo-

<sup>30</sup> Yockey, Hurbert P. (1992) *Information and Molecular Biology*, Cambridge University Press, Cambridge, 290-291

<sup>31</sup> Dembski (2002) 285

<sup>32</sup> Behe, 69-73

<sup>33</sup> Author unknown (2002) *Unlocking the Mystery of Life*, Illustra Media, La Habra, CA

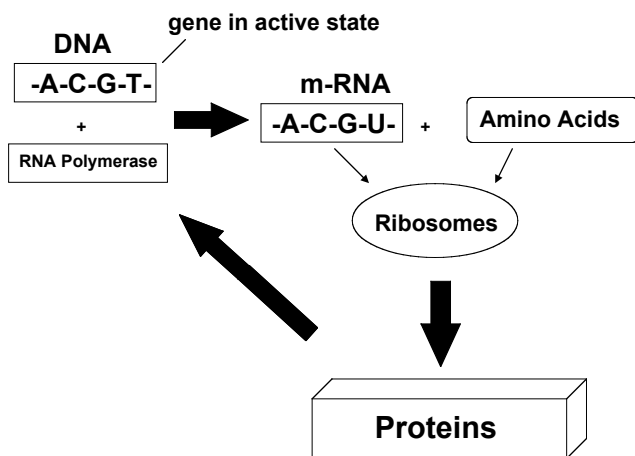


rate system of genetic instructions as well as many other protein machines to time the expression of those assembly instructions. Arguably, this system is itself irreducibly complex. In any case, the co-option argument tacitly presupposes the need for the very thing it seeks to explain—a functionally interdependent system of proteins. Finally, phylogenetic analyses of the gene sequences suggest that flagellar motor proteins arose first and those of the pump came later. In other words, if anything the pump evolved from the motor, not the motor from the pump.<sup>34</sup>

Simply put, the co-option argument, at least in the case of the bacterial flagellum, if anything strengthens the irreducible complexity argument for design by exposing additional levels of irreducible complexity.

Another example of irreducible complexity is the cellular system that synthesizes proteins.<sup>35</sup> DNA and RNA contain molecular languages (codes) using four-letter alphabets. In the case of DNA, the letters are A, G, C, and T (Figure 2). The letters are the same for RNA except T is now U. These letters represent different chemical groups. The sequence of the letters determines the biochemical meaning of the code. The information in the DNA is read by an enzyme (RNA polymerase) that synthesizes a strand of messenger RNA (mRNA). The mRNA is then moved out of the cell nucleus to a molecular factory called a ribosome. The ribosome is an assembly of enzymes (proteins) that *translates* the code in mRNA into a sequence of amino acids to form a pro-

**Figure 2: Protein Synthesis in the Cell**



tein (there are 20 amino acids).<sup>36</sup> The enzyme RNA polymerase is itself made in this same way. DNA is also replicated and repaired by proteins that are enzymes. Notice that all of the parts of the system are required for the system’s function. The DNA holds the information required to make the correct proteins, and the proteins are required to read the information in the DNA and replicate the DNA. This situation speaks to the origin of life problem. All living things from the simplest bacteria to human beings possess this information-processing/protein synthesis system including the DNA code and how it is translated into meaningful sequences of amino acids in proteins. Evolutionists have to explain how a simpler system, one which could have arisen by chance and the laws of chemistry, could have evolved into the DNA/protein system we observe now. A self-replicating molecule that both stores information and acts as a chemical catalyst could begin to help fill this chasm. Some have suggested an “RNA world” may have been an intermediate between the first self-replicating molecules and life as we know it now. Indeed, RNA is able to carry information as well as catalyze some reactions. Still, RNA is relatively unstable and the likelihood of its formation is negligible. Quoting from Rana and Ross:<sup>37</sup>

The origin of life community widely acknowledges the prebiotic production of ribose, cytosine, and polyphosphates [necessary components of RNA] as painfully problematic. In fact, at the opening plenary lecture or ISSOL 2002, after summarizing these and other problems, distinguished origin of life researcher Leslie Orgel stated, “It would be a miracle if a strand of RNA ever appeared on the primitive earth.” As a preface to this conclusion, Orgel remarked that he “hoped no creationists [were] in the audience.” Laughter erupted throughout the room.

So far, no one has identified a biochemically relevant self-replicating molecule let alone how it might have evolved into the complex DNA/protein system of the present world. Some evolutionists have called the DNA code a “frozen accident” since it is universal and does not seem to have evolved since its inception.

Behe has identified several irreducibly complex biological systems including the bacterial flagellum, cilia, blood clotting, intracellular transport, the immune system, and others. Irreducible complexity is an indicator of intelligent design. Darwin himself proposed a test for his theory:

<sup>34</sup> Minnich, Scott A., Meyer, Stephen C. (2004) Genetic Analysis of Coordinate Flagellar and Type III Regulatory Circuits in Pathogenic Bacteria, *Design and Nature II, Comparing Design in Nature with Science and Engineering* WitPress, Southampton, Boston

<sup>35</sup> Dembski (2002) 254-256

<sup>36</sup> The RNA is read three letters at a time. Three letters constitute a codon for one amino acid.

<sup>37</sup> Rana, F., Ross, H. (2004) *Origins of Life*, NavPress, Colorado Springs, CO, 115

“If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down.”

Charles Darwin

ID proponents believe that irreducible complexity has met Darwin’s test over and over, that Darwinism has been *falsified*.

Evolutionists maintain that the observable process of microevolutionary change (variation within kinds) can be extrapolated to the inferred process of macroevolutionary change (molecules to man evolution). They point to observable examples of the action of random variation and natural selection to produce adaptations in organisms such as Darwin’s finches, antibiotic resistant bacteria, industrial melanism in peppered moths, and fruit flies.<sup>38</sup> In each case, however, there is no evidence of an increase in the information of the genome.<sup>39</sup> Indeed, in the case of bacterial resistance, there is evidence that the information content of the genome can *decrease*.<sup>40</sup>

For example, single nucleotide mutations (changing one “letter” in the DNA code) in some bacteria are known to impart resistance to the antibiotic streptomycin. This resistance involves the bacterial ribosomes (Figure 2). As described above, ribosomes are primarily an assemblage of proteins, some of which act as chemical catalysts. Enzymes (catalytic proteins) usually only perform one type of reaction at a specific reactive site with one specific molecule. A molecule is bound to the reactive site, chemically transformed, and released. This specificity is caused by the shape of the protein at the reactive site that, in turn, ultimately comes from the protein’s amino acid sequence. Hence, there is a “lock and key” mechanism where only one molecule can act as the key that fits into the protein’s reactive site (lock). There are other sites in enzymes (not the reactive site) where specific molecules can bind (without reacting) that can change the overall shape of the protein and the reactive site and, hence, the enzyme’s reactivity. Nature uses these other sites to regulate enzymatic activity; some molecules that fit these sites slow down or turn off the enzyme while others accelerate its reactions. An *abnormal* change in the shape of the reactive site can lead to a loss of enzymatic specificity; the lock may now allow more than one key. Some mutations in the DNA that codes for the proteins

of the ribosome can lead to changes in the amino acid sequences which change the shape and hence specificity of the reactive sites and the other binding sites. Streptomycin attaches itself to bacterial ribosomes at a specific protein site causing a change in shape of the reactive site, thereby interfering with protein production and causing the wrong proteins to be made; the ability of the ribosome to accurately translate the information coded in the mRNA to specific amino acids has been impaired. These bacteria die because their ribosomes can’t correctly make the necessary proteins. Ribosomes in mammals don’t have this site of attachment and so no interference with protein production occurs. Mutations in the bacterial genetic code for the ribosome can change the site of attachment on the bacterial ribosomes so that streptomycin no longer binds to the ribosome, thereby imparting antibiotic resistance to such a bacterium. Several possible mutations can lead to antibiotic resistance. However, this adaptation is associated with an *information loss* because the specificity of the ribosome is *decreased*; the speed and accuracy of protein production is reduced in the mutants. It is more correct to say the bacteria lose sensitivity to the drug than to say it gains resistance. Hence, antibiotic resistance in some bacteria to streptomycin is an example of an adaptive mutation purchased with a loss in information. Macroevolution needs adaptive mutations that *add* information to the genome.

A recent review<sup>41</sup> of evolution experiments with microorganisms made several generalizations: (1) initially, populations adapt rapidly via beneficial mutations to new environments but the rate drops off quickly; (2) genetically identical organisms placed in separate but identical environments exhibit parallel molecular evolution, although the phenotypes [outward appearance and attributes] may diverge; (3) *most genes do not change even over thousands of generations*; (4) adaptation to one environment may be associated with loss of fitness in another environment; and (5) in small populations, the rate of formation of adaptive mutations is outstripped by the formation of deleterious ones resulting in a decline in fitness of the population. These conclusions are completely consistent with the creationary position that microevolution involves no net gain in CSI. Indeed, observation (2) suggests that the new adaptive mutants either were initially present or resulted from genetic programming in the initial population; chance is not a good explanation here. Notice that even after thousands of generations, as noted in observation (3), the microorganisms were still the same microorganisms; no macroevolutionary changes were observed.

<sup>38</sup> Wells, Jonathan (2000) *Icons of Evolution*, Regnery Publishing Inc., Washington, DC

<sup>39</sup> In the case of peppered moths it is likely that we don’t understand the cause of the observed variations. See Wells for details.

<sup>40</sup> Spetner, Lee (1998) *Not By Chance*, Judaica Press, Brooklyn, NY, 138-141.

<sup>41</sup> Elena, Santiago F., Lenski, Richard E. (2003) Evolution Experiments with Microorganisms: The Dynamics and Genetic Bases of Adaptation, *Nature Reviews: Genetics* 4: 457-469

There is evidence that organisms can rapidly change in phenotype to increase adaptation to a particular environment. Some changes have been observed that were so rapid that chance mutations cannot account for the adaptations-mutation (mutation rate was slower than changes in phenotype). Rapid adaptation can happen, however, if the organism is preprogrammed to turn on and off regulatory genes in response to environmental stimuli. For example, evidence that adaptive changes can be preprogrammed into the genome comes from experiments with guppies.<sup>42</sup> Two strains of guppies had different gestational patterns and predators. One strain of guppy matured late and had relatively few offspring. Its predator sought young guppies. The second strain matured early and had relatively many offspring. Its predator preferred mature guppies. The second strain was moved to an environment lacking the first strain and where the predator preferring young guppies resided. After just two years, only the first strain of guppies could be found. This rate of change suggests the adaptation was built in and not a result of the random mutation-natural selection mechanism. Hence, no new information was generated with the adaptation.

Evolutionist Richard Dawkins claims that the observable processes of gene duplication (where a daughter cell ends up with two copies of the DNA) and polyploidy (where chromosomes replicate without cell division) create new genetic information.<sup>43</sup> However, having two copies of DNA, like having two copies of the *Complete Works of Shakespeare*, does not amount to having twice as much information. Information must be *novel* and complex to qualify as “new.” But what if one of the duplicate genes continues to function as always (expressed in the phenotype) while the other is free to mutate without being sifted by natural selection? Will the freely mutating gene eventually acquire novel complex specified information and then become active? Not likely. Recent *experimental research* has shown that the likelihood of randomly mutating DNA sequences finding a meaningful arrangement is exceedingly small. For example, the probability of randomly generating the correct DNA code is 1 in  $10^{65}$  for a protein with 100 amino acids and 1 in  $10^{77}$  for a protein with 150 amino acids.<sup>28</sup>

Evolutionists had long held that non-protein coding DNA was the remnant of a random, unguided evolutionary process. Indeed, why would a creator make so much useless, nonsense DNA, they reasoned. Evidence is now mounting, however, that suggests “junk DNA”

does have function after all.<sup>44, 45, 46, 47</sup> Several functions of non-coding DNA are now known. Untranslated portions of mRNA serve as sites of attachment to ribosomes. Organisms with an increased genome size usually develop more slowly. Some species of salamanders with a larger than usual genome (containing more non-coding DNA) are better able to survive in cold environments due to a reduced metabolic rate. Introns (non protein coding DNA) apparently facilitate gene regulation and organization. Introns may guide the folding of DNA in the nucleus, thereby ordering gene expression (creating an index) and hence development of an organism. Some introns catalyze their own removal during the RNA transcription process, revealing a level of complexity previously unappreciated. Some introns are now thought to code for RNA that plays a role in ribosome production and regulation. Non-coding DNA may signal the expression of some genes and the repression of others. The length of the untranslated portion of mRNA can determine the RNA cytoplasmic half-life (how well it binds to the ribosome) and thus its rate of expression into proteins. Non-coding DNA on the ends of chromosomes help maintain integrity of the chromosomes and thereby perpetuate cell lines. Some non-coding DNA repairs breaks in broken DNA. There is evidence that some non-coding DNA sequences may help bacteria to adapt to otherwise lethal changes in their environment. Non-coding DNA may also be the genetic material used for microevolutionary changes. This would help explain how some organisms can have significant changes to their phenotype in a few generations, much faster than a mutation/selection mechanism could operate even if beneficial mutations were highly probable. The more we learn, the more DNA appears to be the product of design and not random processes.

## Examples of Intelligent Design in Biology

### Origin of Life

Next we discuss the origin of life or abiogenesis. It is well known that probability calculations give essentially no chance that specific proteins or nucleic acids of modest molecular weight could have formed by chance and natural processes, even over billions of years. Worse

<sup>44</sup> Standish, Timothy G. (2002) Rushing to Judgment: Functionality in Noncoding or “JUNK” DNA, *Origins*, 53: 7-30. Available online at <http://www.grisda.org/origins/53007.pdf>

<sup>45</sup> Sarfati, Jonathan (2002) *Refuting Evolution 2*, Answers in Genesis, Petersburg, KY, 122-125

<sup>46</sup> Walkup, Linda K. (2000) Junk DNA. *CEN Technical Journal* 14(2): 18-30

<sup>47</sup> Hirotsune S, Yoshida N, Chen A, Garrett L, Sugiyama F, Takahashi S, Yagami K, Wynshaw-Boris A, Yoshiki A. (2003) An expressed pseudogene regulates the messenger-RNA stability of its homologous coding gene. *Nature* 423(6935): 91-96

<sup>42</sup> Spetner, 205-206

<sup>43</sup> Rosenhouse, Jason (2001) The Design Detectives. *Skeptic* 8(4): 60

still, by standard geological dating there was at most only a few hundred million years available for the first life to evolve. We now know from geochemistry and experiment that the early earth did not have the correct environment to facilitate the production of amino acids, one of the basic building blocks of all life. But even if conditions had been right or if tons of amino acids had been delivered to the earth via comet bombardment, there would have still been many problems: the concentration problem—the (the primordial soup would have been too dilute to produce polymers), the chirality problem (only one of two possible three dimensional structures of amino acids are found in life, but both are formed in equal amounts in all known chemical processes outside of biology), the problem of side reactions (the same reactions that make amino acids and proteins also make unwanted amino acids and proteins), the oxygen problem (with oxygen, ozone forms and the UV light required to promote the reactions for formation of amino acids is blocked; without oxygen, the UV light which helps make the building blocks also destroys them), the hydrolysis problem (proteins are cleaved by water to their constituent amino acids), and the information problem, that is, what was the mechanism for arranging amino acids together to form biochemically meaningful proteins. To be sure, evolutionists continue to hold out hope they will find a naturalistic mechanism for the origin of life, but there is little cause for optimism given our current knowledge. In addition, no life has been found on Mars, on Saturn's moon Titan, or by SETI. Most of the planets found around other stars have been gas giants. Belief in abiogenesis is definitely faith based, as there is no scientific evidence to support it. At present, all the evidence suggests that the missing piece of the puzzle is intelligence, the one ingredient naturalism cannot admit.

Abiogenesis may be defined as the natural and spontaneous formation of self-replicating chemical systems (life) from organic (carbon containing) compounds. Clearly, the first step of abiogenesis must be the generation of the organic compounds, the monomers (amino acids) which could combine into polymers (proteins) or macromolecules. How could these compounds have formed on the primitive earth? In the 1950s, Stanley Miller, assuming that the early earth had a reducing (oxygen-free/hydrogen-rich) atmosphere (similar in composition to the current atmospheres of the gas giants of our solar system which contain ammonia, hydrogen, methane, and water vapor), found that amino acids, the building blocks of proteins and enzymes, and other organic chemicals were generated when an electric current ("lightning") was passed through the alleged primordial gas mixture. The results of Miller's work were heralded as proof that the building blocks of life could have occurred naturally and that a critical piece of the puzzle of abiogenesis had been solved. The assumption that the

early atmosphere was reducing was critical, however, since the presence of oxygen would inhibit the synthesis. Most geochemists now believe that the early earth's atmosphere was either neutral (containing carbon dioxide, water vapor, and nitrogen derived from volcanoes) or even oxidizing.<sup>48</sup> Subsequent experiments have shown that electricity passed through a neutral gas mixture does not generate amino acids. Moreover, it is now recognized that any traces of hydrogen present in the early atmosphere would have been quickly lost to space.<sup>49</sup> In addition, water vapor would have quickly formed oxygen and hydrogen in the upper atmosphere as a result of photochemical processes; the hydrogen would have been lost and the oxygen would have inhibited any synthesis. Carbon dioxide is not reduced to methane without hydrogen, and methane is essential to the synthesis of amino acids. If methane had been present in the early atmosphere, the most ancient rocks would contain a variety of organic compounds, but they do not. Evolutionary geologists have shown that rocks "dated" at 3.7 billion years of age contain evidence of free oxygen in the early atmosphere. According to evolutionist Iris Fry, evidence now exists that life was present on the earth as far back as 3.85 billion years ago at about the time the last meteor bombardments of the earth, capable of vaporizing oceans and destroying delicate organic molecules, allegedly took place.<sup>50</sup> Hence, the best available evidence says that the atmosphere of the early earth was probably oxidizing and that only a mere few hundred million years at most were available for abiogenesis. These facts are problematic for abiogenesis, which would require a reducing atmosphere and enormous amounts of time.<sup>51</sup>

There is also the chirality problem. Amino acids have specific three dimensional structures necessary for their use in organisms. Most amino acids possess a property called *chirality* or *handedness* (Figure 3).

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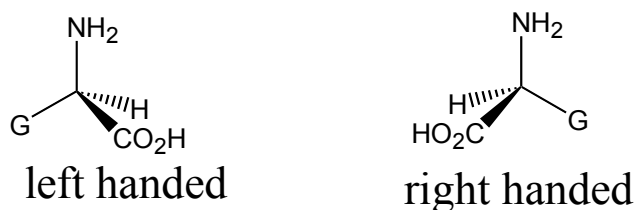
<sup>48</sup> Wells, Chapter 2

<sup>49</sup> Various authors on multiple articles (1990) *Geophysical Research Letters* (23:14), 1865-1890

<sup>50</sup> Fry, Iris (2000) *The Emergence of Life on Earth*, Rutgers University Press, Piscataway, NJ, 125

<sup>51</sup> Despite the evidence against an early reducing atmosphere and the implications for abiogenesis, several recent publications still refer to the Miller-Urey experiment as demonstrating the chemistry of the early earth's atmosphere. Examples of these publications include the 1998 college textbook, *Life: The Science of Biology* by William Purves, Gordon Orians, Craig Heller, and David Sadava; the 1998 edition of *Evolutionary Biology* by Douglas Futuyma; the 1994 edition of *Molecular Biology of the Cell* by Bruce Alberts; and the 1999 National Academy of Sciences' booklet *Science and Creationism*. This information was taken from Wells.

**Figure 3: Chirality and Amino Acids**



Mirror images- not the same molecule

The solid black wedge indicates the bond is coming out of the page towards you, while the dashed wedge means the bond is beneath the page. The "G" stands for any of a number of possible chemical groups.

Consider your hands. Hold your hands out, palms up. Notice that your hands are identical in almost every way except one: they are non-superimposable mirror images.<sup>52</sup> Most amino acids also possess this property. It turns out that in biology, only "left-handed" amino acids are found in proteins. Amino acids synthesized in the laboratory always come in equal amounts of the left- and right-handed versions. The problem this situation poses for theories of the origin of life is to find a natural process outside of biochemistry that produces exclusively left-handed amino acids. So far, no satisfactory answer has been found.

Life probably would not have evolved from non-living chemicals even if the early earth had had a reducing atmosphere and billions of years were involved. There are 20 amino acids found in proteins. In proteins, these amino acids are bound together in sequences much like words in a sentence. As in human language, only specific sequences are useful; all others are gibberish. Charles Thaxton and Walter Bradley carefully calculated the probability of forming a *specific* protein containing 101 amino acids in 5 billion years assuming the earth was covered by a layer of protein molecules (containing only left-handed amino acids) one meter thick and that each protein could rearrange its amino acid sequence  $10^{14}$  times per second.<sup>53</sup> The probability is  $10^{-45}$  or, in other words, impossible, and that's granting generous initial conditions! And that is just the likelihood of forming one protein. Molecular biologists have recently estimated that a minimally complex single-celled organism would require between 318 and 562 kilobase pairs of DNA to produce the proteins necessary to maintain

life.<sup>54</sup> The simplest cells known have hundreds of proteins. Recent estimates for the minimum cell are 1,500 gene products and 250 proteins, and that's for a parasitic organism.<sup>55</sup>

Fry and other evolutionists admit that the emergence of life by chance is unlikely and instead believe that natural laws plus the right conditions are capable of generating the complex information in biomolecules.<sup>56</sup> However, William Dembski, as previously discussed, has demonstrated that neither natural laws, chance, nor a combination of both (stochastic processes) can create new information but can at best translate information from one form into another.<sup>57</sup> Any complex specified information resulting from a natural process must have been present to begin with, either in the original information containing item or the natural process itself. This situation, of course, still raises the question of how the information was introduced in the first place.

Abiogenesis on earth did not have much going for it. The early atmosphere was not reducing as required, the time available was only a few hundred million years according to conventional dating, the probability against making even one complex biomolecule is staggering even under the most favorable conditions over billions of years, and natural law and chance can't create new information. As evolutionist Iris Fry explains:

Contrary to the outdated image of the scientific enterprise as a search for and collection of facts, the realization that many non-empirical factors are involved in determining scientific positions and in the adoption of scientific theories leads to the notion of theoretical and philosophical decision, or commitment. Research into the origin of life and the search for extraterrestrial life are a clear case in point, because here the weight of the philosophical commitment is much greater than in more conventional scientific fields. As long as no empirical evidence of life beyond Earth has been found, and as long as no scientific theory has succeeded in providing a fully convincing account of the emergence of life on Earth, the adoption of an evolutionary point of view toward the question of life's origin and the rejection of the idea of purposeful design involve a very strong philosophical commitment.<sup>56</sup>

This situation has led some evolutionists to believe in panspermia, the theory that life on earth came from an

<sup>52</sup> This means that there is no way to align every point in each hand so that the hands would be indistinguishable.

<sup>53</sup> Thaxton, 146

<sup>54</sup> Koonin, E. (2000) How many genes can make a cell?: the minimal genome concept. *Annual Review of Genomics and Human Genetics* 1:99-116

<sup>55</sup> Rana, 163

<sup>56</sup> Fry, 283

<sup>57</sup> Dembski (1999), chapter 6

extraterrestrial origin. Indeed, Francis Crick, Nobel Prize winner and co-discoverer of the structure of DNA, has suggested this possibility.<sup>58</sup> This solution, of course, does not explain from where the first life originated.

Mutations are the grist for natural selection's mill. However, mutations are rare, most are harmful, the few beneficial mutations usually come at a cost, and none are known to generate new information. For macroevolution, genetic mutations expressed early in embryological development are needed for the generation of new body plans. However, these mutations are usually lethal. Mutations that are expressed late in ontogeny have little effect on body plans and hence would not drive macroevolution. Mutation rates are slow. The cell is equipped with molecular machinery that corrects errors (mutations). Large populations take longer to fix mutations than small populations, but mutations in small populations can be very harmful. A lone mutant has a better chance of survival in a small population, but small populations have greater chance of being wiped out. Also, there is less chance that a mutant will show up in a small population. Overall, there is a greater chance that a positive mutant will appear and survive in a large population. Some adaptive mutants are already in a population and are selected when the need arises. Single mutations can only add one bit of information. Large adaptive changes arising quickly (from one mutation) would be the result of activation of dormant genes, not addition of new information. For macroevolution to work, each mutation must add a little information to the genome, and there must be many positive mutations for one to survive. There are no known adaptive point mutations that add information. Some say that genetic rearrangements (recombinations) are the source of new beneficial mutations. However, recombinations, a normal cell activity, are complex and specific, not random or accidental, and can't help macroevolution.<sup>59</sup>

## Alleged Evidence for Biological Evolution

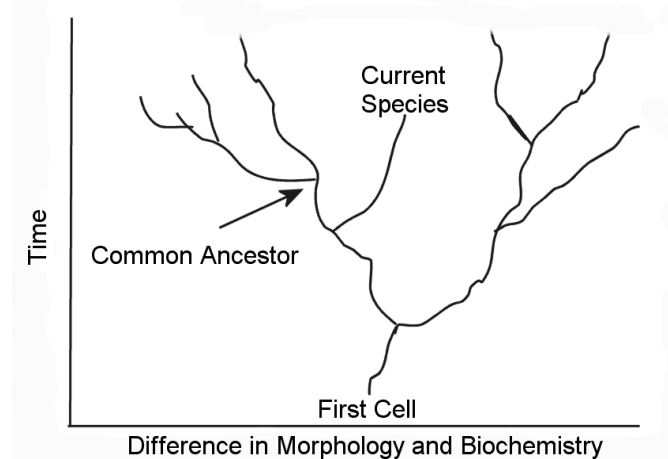
There are several examples usually given in biology textbooks and articles in support of evolution. Molecular biologist Jonathan Wells has reviewed several of these "icons" in his book *Icons of Evolution*.<sup>60</sup> The icons include the Miller-Urey experiments, Darwin's tree of life, Darwin's finches, peppered moths, homology, fruit fly experiments, Haeckel's embryos, Archaeopteryx, and the

horse series. Additional evidences often cited include evolutionary algorithms, the whale series, "junk" DNA, and vestigial organs.

The Miller-Urey experiments (origin of life experiments assuming a reducing atmosphere), evolutionary algorithms, and "junk" DNA have already been discussed.

Darwin's tree of life refers to the pattern of nested hierarchies expected from descent with modification from a common ancestor. Assuming life began as a single cell, evolution would gradually introduce slightly different varieties of cells as the forces of mutation and natural selection played out over billions of years. Isolated populations would evolve differently in different environments. Over time, the differences between cell lines would grow. Eventually different cells would learn how to function symbiotically, eventually leading to cell specialization and multicellular life. In time the varieties of multicellular life branched out into the plant and animal kingdoms we know today (Figure 4).

Figure 4: Darwin's Tree of Life



One would therefore expect to see a tree pattern in the fossil record with the roots on the bottom and the branches on top. The bottom of the fossil record should contain few but closely related and similar life forms. Higher up in the record, the morphological (structural) and biochemical differences should increase. There should be a continuum of intermediate forms showing the gradual introduction of adaptive innovations. One would not expect that fossil organisms from millions of years ago would have descendants alive now that are essentially unchanged.

Contrast those predictions with the "Cambrian explosion" in the fossil record:

The "Cambrian explosion" refers to the geologically sudden appearance of many new animal body plans

<sup>58</sup> Behe, Michael Expert witness paper for the Dover ID Case: <http://www2.ncseweb.org/kvd/experts/behe.pdf>. Crick's paper is exhibit 5 at the end of the report.

<sup>59</sup> Spetner. This paragraph summarizes much of his book.

<sup>60</sup> Wells. There is also an excellent video by Coldwater Media ([www.coldwatermedia.com](http://www.coldwatermedia.com)) entitled *Icons of Evolution*.

[phyla] about 530 million years ago. At this time, at least nineteen, and perhaps as many as thirty-five, phyla of forty total made their first appearance on earth within a narrow five- to ten-million-year window of geologic time. Many new subphyla, between 32 and 48 of 56 total, and classes of animals also arose at this time with representatives of these new higher taxa manifesting significant morphological innovations. The Cambrian explosion thus marked a major episode of morphogenesis in which many new and disparate organismal forms arose in a geologically brief period of time.

To say that the fauna of the Cambrian period appeared in a geologically sudden manner also implies the absence of clear transitional intermediate forms connecting Cambrian animals with simpler pre-Cambrian forms. And, indeed, in almost all cases, the Cambrian animals have no clear morphological antecedents in earlier Vendian or Precambrian fauna. Further, several recent discoveries and analyses suggest that these morphological gaps may not be merely an artifact of incomplete sampling of the fossil record, suggesting that the fossil record is at least approximately reliable.<sup>61</sup>

Thus the “tree of life” is actually upside down and for this reason has been referred to as the “inverted cone of diversity.” Most of the body plans (phyla) of organisms appear early in the fossil record at essentially the same time and without precursors. The Precambrian has been adequately explored so any lack of fossil precursors is not attributable to sampling. Some of the greatest differences found between organisms today appeared from the start. There are fewer phyla now than in the past—some are now extinct. The generation of the vast amounts of information required for the various new body plans, cell types, proteins, and tissue/organ types in a short period of time is beyond the reach of random mutations. In addition, DNA mutation rates are too slow to generate the amount of change in the Cambrian. Some say that molecular studies suggest that many Cambrian organisms evolved much earlier in the Precambrian over long periods of time, but the fossil evidence does not support this position. Intelligent design is a reasonable explanation for the Cambrian explosion.<sup>62</sup>

Molecular evidence for the tree of life is mixed. Scientists compare amino acid sequences of a given protein found in a variety of species. Similar amino acid sequences presumably indicate a recent common ancestor. Such comparisons of molecules can produce evolutionary trees that are the same as those based on morphology

(outward body plans). However, different proteins can yield different trees that differ from each other and the morphology data. One way evolutionists rationalize these differences is horizontal gene transfer (HGT: some cells are able to exchange or transfer genetic material among themselves):

The 20-odd aminoacyl-tRNA synthetases [a class of protein enzymes that synthesize compounds] have obviously been intensely involved in HGTs [horizontal gene transfer]. Roughly, a third of them yield trees that do not exhibit the above-described canonical pattern [expected Darwinian evolutionary tree]. The other two-thirds also break with canonical pattern to one extent or another, but that pattern, albeit eroded, is still evident. Tellingly, this canonical pattern is seen for synthetases that are specifically related to one another, the valine and isoleucine synthetases, for example. Both of these enzymes demonstrate (highly eroded) canonical pattern but differ completely in how they have violated that pattern. The only reasonable explanation here is that the canonical pattern predates the evident HGT that the aminoacyl-tRNA synthetases have undergone, and HGT has failed to erase it completely.

Because all have been subject to widespread HGT, and because they are all functionally of a kind, the aminoacyl-tRNA synthetases as a group provide an especially convincing argument that there exists a genetic trace of our descent from some kind of common ancestral condition. Yet a new realization comes with this finding: although organisms do have a genealogy-defining core of genes whose common history dates back to the root of the universal tree, that core is very small. Our classically motivated notion had been that the genealogy of an organism is reflected in the common history of the majority of its genes. **What does it mean, then, to speak of an organismal genealogy when nearly all of the genes in the cell—genes that give it its general character—do not share a common history? This question again goes beyond the classical Darwinian context.**<sup>63</sup>

In other words, most of the molecular data do not support common ancestry for these cells. Another plausible explanation is that these cells were designed independently without common ancestry. In that case, no tree pattern from comparison of the amino acid sequences of the proteins of various cell types is necessarily expected. The only reason to assume they are related is evolutionary theory, but that is what the data is supposed to demonstrate.

<sup>61</sup> Meyer and references therein

<sup>62</sup> Watch for a new video entitled *The Cambrian Explosion* from Illustra Media currently in production.

<sup>63</sup> Woese, Carl R. (2002) On the Evolution of Cells. Proc Natl Acad Sci USA 99(13):8742–8747

The fossil record has many examples of creatures that seem to be the same now as millions of years ago. These “living fossils” are a problem for evolution, which predicts that organisms should be constantly changing over geologic time.

Examples include the coelacanth fish (fossil coelacanths are believed by evolutionists to be 340 million years old), Ginkgo trees (125 million years), crocodiles (140 million years), horseshoe crabs (200 million years), the Lingula lamp shell (450 million years), Neopilina mollusks (500 million years), and the tuatara lizard (200 million years).<sup>64</sup>

Evolutionists have offered various explanations for living fossils including habitat stability, generalist adaptation to many habitats (*e.g.*, the cockroach), long generation time making evolution slow, changes occurred but were not preserved in the fossils, and so on. A simpler and more reasonable explanation could be that little change has been observed because no new information has been added by the intelligent designer that made them in the first place.

There is a type of evolution called *convergent evolution*, which involves the same characters (body parts) developing in disparate organisms with presumably very different evolutionary histories. If adaptations are accidental, then convergent evolution suggests (against all probability) that the same accident can happen more than once. For example, the eyes of humans and the octopus are very similar. The genes that code for the respective eyes have many similarities, presumably due to a common (unidentified) ancestor that possessed many of the common genes.<sup>65</sup> Echolocation is the sonar used for navigation by bats, whales, and dolphins. The eye and echolocation are highly complex adaptations. It seems doubtful a random process could evolve these structures multiple times over evolutionary history. However, the occurrence of the same structures in otherwise very different organisms would be expected from an intelligent designer, much in the same way programmers use the same code for similar tasks in otherwise different software.

Similar structures in organisms are assumed (by definition) to indicate common evolutionary ancestry. Such similar structures are said to be *homologous*. (This contrasts with characters arising from convergent evolution where similar structures are said to be *analogous*.) How-

ever, there are reasons to question the alleged common ancestry. Homologous features often arise from dissimilar developmental pathways at the embryonic or larval stage in mode of formation, or in the position of formation, or in both. Consider the following quotes:

“The fact is that correspondence between homologous structures cannot be pressed back to similarity of position of the cells of the embryo, or of parts of the egg out of which the structures are ultimately composed, or of developmental mechanisms by which they are formed.”<sup>66</sup>

Gavin de Beer (1960s)

“Homologous structures form from distinctly dissimilar initial states.”<sup>67</sup>

Pere Alberch (1985)

“Homologous features in two related organisms should arise by similar developmental processes... . . . [but] features that we regard as homologous from morphological [structural] and phylogenetic [alleged evolutionary ancestry] criteria can arise in different ways in development.”<sup>67</sup>

Rudolf Raff (1999)

For example, for salamanders the order of digit development is head to tail, the opposite of most other vertebrates (tail to head). The development of skeletal patterns involves the formation of cartilage first that then turns into bone. There is no evidence of a common ancestral cartilage pattern; all organisms have a unique cartilage structure from the beginning.

If neo-Darwinism is true, then homologous structures in different organisms should come from similar genes. However...

“This is where the greatest shock of all is encountered...[because] characters controlled by identical genes are not necessarily homologous...[and] homologous structures need not be controlled by identical genes.” “[Therefore] ...the inheritance of homologous structures from a common ancestor...cannot be ascribed to identity of genes.”<sup>68</sup>

Gavin de Beer (1971)

Hence developmental pathways (position and mode of formation) of homologous structures (in embryos) may differ. Development of homologous structures is not always controlled by identical genes. Identical genes don't always control the development of homologous structures. Therefore similarity of structures is not a reliable

<sup>64</sup> Catchpoole, David (2000) *Creation Ex Nihilo* 22(2):56

<sup>65</sup> Ogura, A., Ikeo K., and Gojobori T. (2004) Comparative analysis of gene expression for convergent evolution of camera eye between octopus and human *Genome Research* 14:1555-1561

<sup>66</sup> Wells, 71

<sup>67</sup> *Ibid.*, 72

<sup>68</sup> *Ibid.*, 73



indicator for descent with modification from a common ancestor.

Darwinian evolution is supposed to be a gradual process over millions of years. The fossil record, however, does not show the expected smooth transitions. There are systematic gaps between all major taxa. Stasis and extinction are the hallmark of the record, with few if any true intermediate forms. The late Harvard paleontologist Stephen J. Gould said that the rarity of transitional forms was the “trade secret of paleontology.”<sup>69</sup> Gould proposed the theory of punctuated equilibrium to help account for this disparity. According to punctuated equilibrium, evolution occurs in rapid spurts brought on by rapid changes in the environment. The transition period between species is so short (geologically speaking) that the intermediate forms leave few fossils. So, although the intermediates did exist, we can’t find them. But this theory raises other issues such as the requirement that many positive complimentary mutations would have to occur in a short time period, a highly unlikely event.

Observation of the finches of the Galapagos Islands, the place it is said Darwin found his inspiration for his book the *Origin of Species*, has provided strong evidence for the operation of natural selection. During times of drought, finches with long beaks dominate the finch population more than when rainfall is normal. Birds with long beaks are able to break into thick, tough and dry seeds to obtain food, while birds with short beaks are less able. Natural selection influences which finches are most likely to survive and reproduce. This is a clear example of microevolution. However, when normal rainfall returns, the population again has a large segment of birds with small beaks because the moist seeds are easier to break open. So, while an excellent example of natural selection and microevolution, Darwin’s finches do nothing to substantiate molecules-to-man macroevolution. They show that microevolution is reversible. Natural selection does not account for the origin of finches with long and short beaks, just the relative amounts of these birds in the population.

During the industrial revolution in England, the bark of some trees that had been covered with a light colored lichen darkened from absorbed soot. Peppered moths lived in the trees. These moths occurred in light and dark varieties. The lighter variety dominated until the industrial revolution. As the lichen cover was lost and tree bark darkened, the darker moth began to dominate. This phenomenon was held up as an excellent example of natural selection. Pictures in textbooks showed the moths resting on tree trunks. The theory was that predators (birds) ate the most visible moth leaving the other to

thrive. Both forms have always existed, just in different ratios; there is no evidence that one form evolved from the other.

It turns out that moths in the wild don't rest on tree trunks but in the upper canopy. Textbook photographs were staged. Investigators used dead moths or placed living moths on the tree trunks. Results of experiments where living moths were released directly on the tree trunks seemed to support theory, but were unrealistic. Moths are night flyers and dormant during daylight hours. Moths released on tree trunks remained in place. Darker moths did not replace the lighter variety in all polluted areas. The darker variety dominated in some unpolluted areas. In areas where pollution decreased, the lighter variety returned before the lichens. Other factors besides camouflage were involved. There was some correlation between the darker variety and sulfur dioxide levels. At present the causal factors for the lighter/darker moth population ratios are not well understood. Hence, peppered moths are no longer a clear example of natural selection.

Some biology textbooks provide drawings by Ernst Haeckel, a contemporary of Darwin, of various vertebrate embryos.<sup>70</sup> The embryos appear very similar at an early stage, presumably demonstrating common ancestry. However, Haeckel faked his drawings. Evolution predicts that the earliest stages of embryonic development between related organisms should be most similar, but instead an intermediate stage is where greatest similarity occurs. Embryos of different organisms can be distinguished from the start. The idea that ontogeny recapitulates phylogeny, that embryonic development replays the evolutionary history of the organism, is thus not supported by the evidence. Embryos develop in unique ways from the start. They don't develop through adult forms of ancestors. “Gill slits” in human embryos eventually become parts of the ear and have nothing in common with fish gills.

There have been many mutation experiments with fruit flies. One artificial mutant was a four-winged fruit fly not seen in nature. These mutants are claimed to demonstrate that genetic mutations are the engine of evolutionary change. However, no new information was generated. In the four-winged flies, a regulatory gene that controls wing growth is turned off. The second pair of wings was non-functional, actually impaired flight and mating, and had no survival value. Thus the four-winged flies were cripples. Experiments in which multiple mutants have been formed in the lab have never resulted in one case of a fly better able to survive in the

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<sup>69</sup> Gould, Stephen J. (1977) Evolution's erratic pace. *Natural History* 86:12-16

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<sup>70</sup> Wells, chapter 5

wild. Mutant fruit flies don't help make the case for macroevolution.<sup>71</sup>

### **Examples in Cosmology and Physics**

The physical universe outside of biology also shows evidence for intelligent design.<sup>72,73,74,75</sup> There is evidence that the universe had a beginning; that the laws of physics are fine-tuned for life as we know it; that the earth, moon, our solar system, our star, and our location in the Milky Way suggest intelligent design.

The first and second laws of thermodynamics tell us that the amount of matter-energy in the universe is a constant and that the amount of useful energy is irreversibly decreasing. Taken together, these laws predict the universe will eventually die a "heat death" where there will be no *useful* energy. Since the universe still has plenty of useful energy, these laws require that the universe has a finite age, or in other words, a beginning. Additional evidence for the finite age of the universe comes from astronomy. Edwin Hubble measured the frequencies of light coming from other galaxies. The light from stars bears the fingerprints of the elements in the star's atmosphere. Each element gives unique spectra related to the electronic energy levels of the atom. What Hubble found was that the light from most galaxies had spectra of elements like nearby stars, but the frequencies of light were systematically changed. Hubble eventually realized that the changes in the frequencies of light from other galaxies were a measure of the galaxies' motion relative to the earth. Most galaxies' light was red-shifted (had longer wavelengths), meaning that the galaxies were moving away from us. We now know that measurements of this type allow us to determine the velocity of and distances to galaxies. This evidence and more recent observations suggest that the universe is expanding and that the expansion is accelerating. Running the expansion in reverse (backwards in time) leads one to conclude that the matter of the known universe was at the same place at some time in the past. Physicists believe that the matter was compacted into a small volume with unimaginable temperature, gravity, and density. This was the alleged seed of the Big Bang. After a certain density, our best theories break down and time seems to stop. The universe becomes a singularity, a cosmological

black box, the physics of which are not understood. These results also suggest the universe had a beginning. At present, we know of no natural processes that can explain the origins of matter-energy and time. These facts, taken together, require that the universe had a beginning and therefore a cause that existed before (independent of) time and the universe itself. The God of the Bible is a logical possibility.

To be sure, scientists are doing research to try to find a natural cause of the universe, a theory that gets around the laws of thermodynamics and allows for an eternal universe without need of a creator. String Theory is one such proposal. String theory is an attempt to unify quantum mechanics (physics of the subatomic realm) and relativity (our best theory of gravity) to produce a quantum theory of gravity. It is believed that such a theory would be able to see into the black box of the singularity and give a complete description of the origin and fate of the universe. Some believe, for example, that time does not stop in a singularity but only changes direction. Stephen Hawking refers to what he calls "imaginary time" dominating when normal time stops. It will take many years to fully develop string theory. Some scientists question whether it will be testable. At present, string theory predicts that all subatomic particles and fundamental forces are derived from tiny strings of energy. Physicists have used atom smashers to probe the atom. However, it is estimated that the atom smasher needed to detect strings would be the size of our galaxy. Another prediction is that there are an infinite number of parallel universes, each with its own unique physical laws and history. In such a scenario, the improbable becomes inevitable, just the odds evolution needs to succeed. How could we test for the existence of a parallel universe? No one knows. For now at least, string theory is closer to metaphysics than testable science. But even if string theory is eventually supported by some observations, this will not require that the whole package is true. Just because the universe may have properties consistent with string theory won't prove that history was shaped by string theory.

We live in a universe dominated by matter without evidence for antimatter. Why is there an excess of matter over antimatter? Matter is made of elements that have a positively charged nucleus (protons and neutrons) surrounded by negatively charged electrons. Antimatter has elements with a negatively charged nucleus (anti-protons and anti-neutrons) surrounded by positively charged positrons. Antimatter has been made in the laboratory. Antimatter and matter convert to energy when combined; the energy can be transformed back into matter and antimatter – both processes have been observed. Whenever energy is converted to matter, there is also an equal amount of antimatter formed. What process in the early universe could have caused matter

<sup>71</sup> Ibid., chapter 9

<sup>72</sup> *The Privileged Planet*, Illustra Media La Habra, CA ([www.illustramedia.com](http://www.illustramedia.com))

<sup>73</sup> Ward, Peter, Brownlee, Donald (2000) *Rare Earth: Why Complex Life is Uncommon in the Universe*, Copernicus, New York, NY

<sup>74</sup> Heeren, Fred (2004) *Show Me God*, What the Message from Space Is Telling Us About God, Second Edition, Day Star Publications, Olathe, KS

<sup>75</sup> Denton, Michael (1998) *Nature's Destiny*, The Free Press, New York, NY

to be preferentially formed? Again, the God of the Bible is a logical possibility.

Why are the four fundamental forces (gravity, electromagnetism, the weak and strong nuclear forces) finely tuned so that human life can exist? If these forces were only varied slightly, stars would burn differently (too hot or too cold), the chemical properties of the elements would be different; indeed, the periodic table of the elements would be different. Organic chemistry would change and therefore life as we know it would be impossible. There are no easy naturalistic explanations for these questions. A finely tuned universe that had a beginning suggests an intelligent cause.

More fine tuning is evident in the earth's distance from the sun (we live in a narrow habitable zone of solar heat), the type of star the sun is (burns with the needed heat and light), the earth's molten iron-nickel core and the resulting magnetic field (which protects us from the solar wind [lethal ionizing radiation]), the size of the moon (which stabilizes the earth's climate by maintaining the tilt of the earth's axis and allows for perfect solar eclipses which facilitated confirmation of Einstein's theory of relativity and study of the sun's atmosphere), earth's position in the Milky Way (which is relatively safe from supernovae and radiation compared to the galactic core and facilitates study of extragalactic phenomena), the presence of Jupiter (which protects the inner solar system from comets), the composition of the earth's atmosphere (ozone from oxygen protects us from UV light and it is transparent), and the properties of water (its high heat capacity helps maintain the earth's climate and its solvent properties are ideal for biochemistry). All these facts taken together strongly suggest design with a purpose rather than mere coincidence and chance.

### **Criticism of ID**

The ID movement has many critics, both evolutionist and creationist. Evolutionists claim ID is stealth religion, is not testable, will harm science, is an argument from ignorance, does not make predictions, and so forth. They also claim that imperfection in nature proves God could not be the creator. They complain that ID proponents do not publish in mainstream peer reviewed scientific journals.

As discussed, ID is founded on scientific principles and observations and makes logical inferences to the best explanations. The explanatory filter makes detection of design empirical and hence scientific. Theism had a primary role in nurturing science's investigation of the universe. Belief in God led to the assumption that the universe must be a rational and understandable place with laws governing most of its activity. The Big Bang

theory (implies the universe had a beginning) and the fine-tuning of the universe have raised the possibility of design. Cosmologists like Stephen Hawking have often included God in their discussions. Scientists are still trying to overcome these design implications. Hence, scientists won't stop looking for natural causes to the origin of species if design is an acknowledged possibility in biology. Design won't hurt science; science owes its existence to design!

Applying reverse engineering principles (assuming design) over the last 50 years in molecular biology has been responsible for the breakthroughs in the understanding of molecular machines.<sup>76</sup> The claim of design for a given irreducibly complex biological system can be falsified by experimentally demonstrating the existence of functional precursor systems. ID would also be falsified by finding natural processes that can generate CSI.

ID is not an argument from ignorance but is the best inference based on what we *do know*. The Law of Conservation of Information, the laws of probability, and experimental results do not support the mutation/selection mechanism for generation of CSI. On the other hand, we have evidence that intelligent causes (ourselves) can generate CSI. The burden of proof should be on evolution to show that a mindless random process can generate the information equivalent of an encyclopedia. The inference to intelligent causation in biology is the best available explanation given our current state of knowledge.

The argument that there is imperfection in nature, and that this disproves God made the world, is faulty on several counts. First, this is a theological argument and has no bearing on the scientific claims of ID. Strictly speaking, ID only claims that intelligent causes are required to explain the CSI found in the biological world and does not say anything else about the designer. Second, it is presumptuous to claim we know what would be a better design when we don't have an exhaustive knowledge of the objects in question. ID theorists speak of constrained optimization of several variables to describe designed systems in biology. This means that each component of an organism is optimally designed to function in concert with all the other components. Third, creationists would say we do not know the entire impact the Fall may have had on the biological world; we do know that physical death and prey/predator relationships were introduced at that time. We don't know what damage may have been done to genomes of various organisms at the Fall or over time.

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<sup>76</sup> Minnich, Scott Expert report for the Dover ID Trial, available at <http://www2.ncseweb.org/kvd/experts/minnich.pdf>

The charge that ID proponents don't publish in the scientific literature is simply false. Drs. Behe, Dembski, Wells, Meyer, and Minnich all have considerable publication records in the scientific literature.<sup>77</sup> However, there is ample evidence that attempts to publish anything explicitly supporting ID can face unfair, even irrational bias.<sup>78</sup>

Creationists have complained that ID is fine as far as it goes but that it falls short of bringing people to the gospel.<sup>79</sup> For the Christian, ID is a tool for evangelism and not an end in itself. Christian ID proponents see their task as bringing theism back into respectable discourse, paving the way for the church at large to do evangelism.

### ***ID, Public Schools, and the Law: The Dover Case***

The ID movement fell on hard legal times recently in Dover, Pennsylvania.<sup>80</sup> The Dover school board wanted a brief statement to be read to ninth grade biology classes at the beginning of each semester. The statement basically said that evolution is a theory, not a fact and that intelligent design is an alternative scientific view. There were otherwise no plans to change the pro-evolution curriculum. Some parents complained, and a lawsuit was filed. Many friends and foes of ID were invited to testify at trial or to provide expert opinion. The judge, in his 139 page opinion, claimed that ID was motivated by religion, not science, and if mentioned in schools would have the effect of promoting religion in violation of the First Amendment's establishment clause. He further claimed that ID was not science but was an offshoot of fundamentalist creation science, contrary to both creationists and ID proponents. The judge bought into the idea that Darwinian evolution is religiously neutral. The Catholic church's support of evolution has nurtured this view. The Discovery Institute, flagship organization for the ID movement, has recently published a book on the trial.<sup>81</sup> Discovery says that while they

support the teaching of the evidence for *and* against evolutionary theory, they have not advocated the explicit teaching of ID in public schools; hence Discovery did not fully support the actions of the Dover school board.

The long-term effects of the decision are uncertain. ID leader Philip Johnson is pessimistic about the chances of ID finding its way into public schools anytime soon.<sup>82</sup> He thinks that Christians should instead focus their efforts on teaching the next generation about creation at home and in the church. A recent article in the Los Angeles Times suggests this approach may hold some promise.<sup>83</sup> As stated at the beginning of this essay, polls show that most Americans support the teaching of intelligent design despite the best efforts of evolutionists to control the schools.

### ***Conclusion***

In summary, design in nature is now empirically detectable as complex specified information (CSI) by the contingency, complexity, specification criteria where the complexity of an object or an event equals or exceeds 500 bits of information. Neither chance, law, or stochastic processes are able to generate new CSI. Evolutionary algorithms can shuffle information around but cannot generate new CSI. The Law of Conservation of Information requires that the information content of a closed system remain the same or decrease with time. Irreducibly complex biological systems could not have evolved since any precursor would have been non-functional and hence not selected. The evolutionary theory of co-optation of pre-existing parts to build novel structures fails to account for the evolution of the systems required to assemble the parts into the new structure. There are no known examples of microevolutionary adaptations that involve an increase in CSI, but there are examples where the CSI decreased; there is therefore no empirical justification for the extrapolation of microevolution to macroevolution. There is evidence that the phenotypes of organisms can change rapidly and these changes are triggered by environmental cues. The rate of these changes rule out random mutations as the cause but instead suggest the activation/deactivation of genes already present. Gene duplication is not the same as generating new CSI. So-called "junk DNA" increasingly appears to have function, negating the argument that DNA could not have been designed. Mutations are rare,

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and the Kitzmiller V. Dover Decision, Discovery Institute, Seattle, WA

<sup>82</sup> This comment was made by Mr. Johnson while filming a video on intelligent design in Raleigh, NC in 2006. The video will be released by the North Carolina Family Policy Council (<http://www.ncfamily.org/>).

<sup>83</sup> <http://www.latimes.com/news/printedition/la-na-evolution31mar31%2C0%2C6635588.story?coll=sns-ap-politics-headlines>

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<sup>77</sup> See the expert reports for the Dover ID trial for publication lists for Behe, Dembski, and Minnich (<http://www2.ncseweb.org/kvd/index.php?path=experts/>). For Meyer see <http://www.discovery.org/fellows/>. For Wells and others see <http://www.discovery.org/csc/>.

<sup>78</sup> See <http://www.rsternberg.net/> for the story of what happened to a fair-minded evolutionist who allowed an ID paper to be published after favorable peer review!

<sup>79</sup> Morris, Henry (2006) *Intelligent Design and/or Scientific Creationism (#208) Back to Genesis*, Institute for Creation Research, Santee, CA, <http://www.icr.org/pdf/btg/btg-308.pdf>

<sup>80</sup> The complete court record including expert witness reports can be found at <http://www2.ncseweb.org/kvd/>

<sup>81</sup> Dewolf, David K., West, John G., Luskin, Casey, Witt, Jonathan (2006) *Traipsing Into Evolution: Intelligent Design*

most are harmful, and none are known to add information to the genome. The observed fine-tuning of physics is what we would expect if the universe were designed. Many of the alleged evidences for evolution don't support macroevolution. The best available evidence supports creation and intelligent design. The best way to

reach the next generation with the creation message may be through families and the church, not the public schools. ❧

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