

Article

Needed: A New Vocabulary for Understanding Evolution

Needed: A New Vocabulary for Understanding Evolution

Fredric P. Nelson



Fredric P. Nelson

Correctly defined words are essential for understanding evolution. Confusion reigns because microevolution and macroevolution are defined at the level of species rather than at the level of DNA. Causative agency is frequently ignored or ascribed to naturalistic mechanisms without supporting evidence. Biological relationships do not reveal causal agency in DNA alterations. Natural selection refers to the elimination of inferior individuals and not to the production of abundant protein variations. Methodological naturalism is only an approximation of how the universe usually runs. No scientific theory of evolution exists. Intelligent design and natural science are separate entities. Biology is composed of scientific systems and nonscientific origins.

Microevolution and macroevolution must be defined such that each reflects the complexity of the change in the information occurring at the level of DNA.

Understanding the field of evolution requires a unique vocabulary. Unfortunately, the current vocabulary includes words, which are inappropriately defined. Also, some standard definitions are simply ignored. This vocabulary has created the greatest confusion in the debate concerning biological origins.

Microevolution, Macroevolution, and DNA

Charles Darwin stated that evolution was “descent with modification through variation and natural selection.”¹ This definition had two fundamental deficiencies, for it stated neither the cause of the modifications nor the site of the modifications. Since descent began with the initial replication, Darwin’s definition excluded the evolution of the first cell.

Unfortunately, modern definitions fare no better. In 2001, Ernst Mayr, the late Alexander Agassiz Professor of Zoology at Harvard

University, defined microevolution as evolution at or below the level of species and defined macroevolution as evolution above the level of species including the evolution of higher taxa and the production of new structures and other evolutionary novelties.² In 2002, John Rennie, senior editor for *Scientific American*, defined microevolution as changes within species over time and macroevolution as changes in taxonomic groups above the level of species over time.³ As with Darwin’s definition, these modern definitions state neither the cause of the modifications nor the site of the modifications, and they also exclude the evolution of the first cell.

Evolutionary change occurs at the level of DNA. Microevolution and macroevolution must be defined such that each reflects the complexity of the change in the information occurring at the level of DNA. Further, each must have a modifier that states the causal agency of the change.

Microevolution is best defined as an alteration of the information present within DNA molecules, which already exist and already function. Causal agency in microevolution could be natural causes, genetic engineering by scientists or aliens, or supernatural genetic engineering, hereafter referred to as intelligent design. Examples of microevolution, therefore, include point mutations, deletions, recombinations, exon shuffling, and the addition of DNA via plas-

Fredric Nelson is a pediatrician and has been in private practice in Philadelphia for the past 25 years. In 1965, he received his BA degree from St. Olaf College and, in 1969, his MD degree from the University of Minnesota. He spent two years on active duty in the US Naval Reserve and three years in pediatric residency at the Boston Floating Hospital. [At one time, it really did float.] Fred focused on evolution in 1998 after the National Academy of Sciences published *Teaching About Evolution and the Nature of Science*, for this monograph was truly unscientific in handling definitions, data, and logic. Fred is married to Christine and has four children – the eldest married and the three younger being homeschooled. The family attends Crossroads Community Church in Upper Darby. Fred can be reached at: *Rethinking Evolution*, PO Box 1145, Lansdowne, PA 19050.

mids, viruses, or other DNA segments. Gene duplication is microevolution-in-progress, although a nonfunctional duplicate may have originated in an ancestral genome many millions of years previously. Probably most surprising is that the evolution of the first eukaryote cell, as described by Mayr, would be a form of microevolution. He wrote:

The origin of the first eukaryote was a major evolutionary step. What apparently happened was the formation of a chimera through symbiosis between an archaebacterium and a eubacterium to produce the first eukaryote ... The mitochondria were derived from the alpha subdivision of the purple bacteria (proteobacteria) and the chloroplasts of plants from cyanobacteria.⁴

In this scenario, a spectacular form of microevolution occurred as existent, functional DNA from several bacteria recombined to form new organisms. The causative agency for the assembly of the first eukaryotes is not known, but the agency could have been naturalistic microevolution, microevolution by the genetic engineering of aliens, or microevolution by intelligent design. A fourth possibility is that the eukaryotes were created anew by progressive creation.

Microevolution is best defined as an alteration of the information present within DNA molecules, which already exist and already function. ...

Macroevolution is best defined as the generation of new, coherent, and comprehensive information within DNA molecules.

Macroevolution is best defined as the generation of new, coherent, and comprehensive information within DNA molecules. At some point in time, the information generated by naturalistic macroevolution did not exist in nature. Causal agency in macroevolution could be natural causes, genetic engineering by scientists or aliens, intelligent design, or progressive creation. Macroevolution may be as minimal as a *specific* mutation occurring in a single, *specific* codon as the final step in producing a functional enzyme following exon shuffling. Or it may be as extensive as aligning the hundreds to thousands to millions

of nucleic acids needed to code for a functional enzyme, a functional metabolic process and/or a functional organ.

The complexity of the generation of new, functional information occurring in macroevolution is many, many orders of magnitude greater than the complexity of the alteration of existent information occurring in microevolution.

Unique Categories of Evolution

The unique categories of evolution, which are of general interest and debate, are:

1. Naturalistic evolution of the first cell (chemical evolution)
2. Naturalistic microevolution
3. Naturalistic macroevolution
4. Intelligent design including the intelligent design of the first cell, of microevolution, and of macroevolution
5. Progressive creation including the creation of the first cell and the progressive creation of a phylum, class, order, family, genus, and/or species

Each category is unique. The alteration of existent DNA—microevolution—is not the foundation for the generation of new, coherent, and comprehensive information within DNA—macroevolution. In 1980, Roger Lewin wrote:

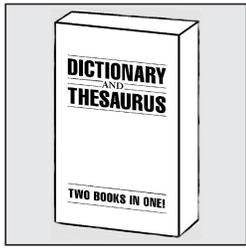
The central question of the Chicago conference was whether the mechanisms underlying microevolution can be extrapolated to explain the phenomena of macroevolution. At the risk of doing violence to the positions of some of the people at the meeting, the answer can be given as a clear, No.⁵

In current communication, two types of errors frequently occur. Firstly, the specific category of evolution is not stated or not known. Secondly, a set of data belonging to one category of evolution, usually naturalistic microevolution, is applied to another category, usually naturalistic macroevolution. No biologist, scientist, or teacher should refer to evolution without stating causative agency and without using the appropriate modifier—of the first cell, micro-, or macro-. Hopefully, no Christian would fail to state causative agency, for though we can render unto nature that which is naturalistic, we are to render unto God that which is God's.⁶

The origin of a new protein, phylum, class, order, family, genus, or species by one category of evolution does not preclude the origin of a different protein, phylum, class, order, family, genus, or species from occurring by one of the other categories of evolution.

Relationship vs. Causation

Naturalistic evolutionists use comparative data obtained through the study of DNA, proteins, homologous struc-



Article

Needed: A New Vocabulary for Understanding Evolution

Naturalistic macroevolution has absolutely no unique and unequivocal supporting scientific data ... Natural selection, as the term implies, only should refer to the elimination of inferior individuals and never to the production of abundant protein variations.

tures, and fossils to reveal relationships between species. They claim that these relationships occurred only by naturalistic processes. However, DNA gives no clue as to the causation of its assembly. DNA would be identical whether it was assembled by naturalistic macroevolution, by intelligent design, or by progressive creation. No smoking gun exists. DNA from different species could be congruent to any extent desired by an intelligent designer. A 99.9% congruence of DNA between two species may reflect the purpose of the designer rather than descent from a common ancestor. Since DNA does not reveal the causative agency in its assembly, neither do proteins, homologous structures, or fossils. A fossil record, which included every desired transition fossil, would not imply causation by naturalistic macroevolution to the exclusion or detriment of intelligent design or progressive creation.

The sum of the scientific data, which uniquely and unequivocally supports naturalistic macroevolution to the exclusion of intelligent design and progressive creation, can be tallied as follows:

All supporting data from the study of	
DNA	0
RNA.....	0
proteins	0
homologous structures and species....	0
fossils.....	+ 0
Total of all supporting data	0

Naturalistic macroevolution has absolutely no unique and unequivocal supporting scientific data, for what could a naturalistic universe do that an intelligently designed universe not do? The belief that all evolution occurred naturalistically is based on two presuppositions: (1) the universe conforms exclusively to methodological naturalism and (2) no supernatural agency exists.

Natural Selection Equals Elimination

Mayr stated that natural selection should be considered a two-step process. The first step is the production of abundant variations. The second step is the elimination of inferior individuals.⁷

Unfortunately, the term “natural selection” provides no indication that it is a two-step process. It certainly implies the

elimination of inferior individuals, but it does not imply the production of abundant variations. And this is no idle matter. Mayr stated: “The theory of evolution by natural selection ... no longer requires God as creator or designer.”⁸ And “Darwin’s theory of natural selection made any invocation of teleology unnecessary.”⁹

At first glance, Mayr seems correct. The elimination of inferior individuals by natural selection certainly appears devoid of supernatural intervention. However, the first step, the production of abundant variations by naturalistic processes would not be abundant enough. As is noted under the following heading, naturalistic macroevolution fails to be adequate for the production of even one small, integrated, functional, complex enzyme.

The elimination of inferior individuals, by itself, cannot be the driving force behind evolution, because eliminating any individual *decreases* the total gene pool. The production of abundant protein variations occurs by microevolution and macroevolution, not by the elimination of inferior individuals. This production necessarily precedes natural selection, for a protein that is never assembled is never subjected to natural selection.

The complexity of macroevolution far exceeds the complexity of natural selection between unequal organisms. Macroevolution is the limiting factor in evolution, and, by comparison, natural selection between unequal organisms is almost a mundane process. Natural selection, as the term implies, only should refer to the elimination of inferior individuals and never to the production of abundant protein variations.

Science and Supernatural Agency

The National Academy of Sciences wrote: “The statements of science must invoke only natural things and processes.”¹⁰ Similarly, the National Science Teachers Association stated: “[Science] cannot use supernatural causation in its explanations.”¹¹

Actually, science can invoke supernatural causation for physical objects that have been supernaturally designed and assembled. Failure to do so would result in erroneous

attribution and scientific error. Two examples where causation should be attributed to supernatural agency will suffice.

Example #1: Since nearly 99% of the human genome is identical to the chimpanzee genome,¹² most scientists believe that *Homo sapiens* and chimpanzees evolved naturalistically from a common ancestor. This branching would have occurred less than ten million years ago.¹³ The human genome contains more than 20,000 genes.¹⁴ The genetic code for the equivalent of two hundred or more genes would have assembled in the human genome over the past ten million years. Each birth is equivalent to one try or one chance toward the naturalistic macroevolution of *Homo sapiens*. The number of these births has never exceeded ten billion (10^{10}) births in any year. The number of ancestors to *Homo sapiens* over the past ten million years has been less than 10^{17} individuals.

Naturalistic macroevolution fails to account for the assembly of only one small, integrated, functional, complex enzyme, and absolutely fails to account for the evolution of all species.

The probability of naturalistically assembling the genetic code for a small, integrated, functional, complex enzyme of one hundred amino acid residues is about one chance in 10^{65} per try.¹⁵ The probability of naturalistically assembling just one such genetic code with fewer than 10^{17} tries is less than one chance in 10^{48} , which is less than one chance in a trillion trillion trillion trillion. If a wager were made of one atom of gold at the odds of one chance in 10^{48} , a win would net a sphere of solid gold that would be 5% of the mass and 1.5% of the volume of Earth.

Naturalistic macroevolution does not account for the assembly of the genetic code equivalent to one and much less two hundred integrated, functional, complex enzymes. The naturalistic macroevolution of *Homo sapiens* from a common ancestor with the chimpanzee is a highly irrational scientific hypothesis. *Homo sapiens* exist because of God's supernatural design and activity.

Example #2: *E. coli* are about 2 microns in length and 0.2 microns in diameter and have a volume greater than 0.25 cubic microns. Since a cubic meter contains 10^{18} cubic microns, fewer than 4×10^{18} *E. coli* could be stacked into one cubic meter. A collection of 10^{50} *E. coli* would fill a volume greater than 2.5×10^{31} cubic meters.

Earth contains less than 1.5×10^{18} cubic meters of water. A volume of 2.5×10^{31} cubic meters is 1.666×10^{13} times the volume of Earth's water. A collection of 10^{50} *E. coli* could fill 100% of all bodies of water on Earth every day for more than 45 billion years. Therefore, fewer than 10^{50} *E. coli* have existed on Earth over the past 3.5 billion years, and, as a logical deduction, a total of fewer than 10^{50} individual organisms from all species have existed on Earth during the same period of time.¹⁶

Every step of naturalistic macroevolution for all species had to have occurred with fewer than 10^{50} tries. The probability that naturalistic macroevolution ever assembled just one small, integrated, functional, complex enzyme with fewer than 10^{50} tries is less than one chance in a million billion. Naturalistic macroevolution fails to account for the assembly of only one small, integrated, functional, complex enzyme, and absolutely fails to account for the evolution of all species. The naturalistic macroevolution of all species is an extremely irrational scientific hypothesis.

Science attributes the design and assembly of a watch to intelligent human agency. Science can and must attribute the design and assembly of *Homo sapiens* and of every species/genus/family to supernatural intelligent agency.

No Scientific Theory of Evolution Exists

The National Academy of Sciences wrote: "Evolution is one of the strongest and most useful scientific theories we have."¹⁷ Is this statement true?

Confusion exists between the definition of a scientific theory, a scientific hypothesis, and the popular definition of a theory. Many scientists talk about a scientific theory when, in fact, they are talking about a scientific hypothesis or conjecture.

The National Association of Biology Teachers stated:

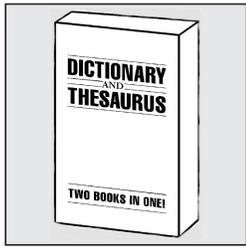
In science, a theory is not a guess or an approximation but an extensive explanation developed from well-documented, reproducible sets of experimentally-derived data from repeated observations of natural processes.¹⁸

The National Academy of Science stated that:

An idea that has not been sufficiently tested is called a hypothesis. Different hypotheses are sometimes advanced to explain the same factual evidence. Rigor in the testing of hypotheses is the heart of science. If no verifiable tests can be formulated, the idea is called an *ad hoc* hypothesis.¹⁹

Therefore, a *scientific* theory requires confirmatory data derived from valid, reproducible, scientific experimentation and cannot be based on observations alone.

A scientific hypothesis is "an unproved theory, proposition, supposition, etc. tentatively accepted to explain



Article

Needed: A New Vocabulary for Understanding Evolution

For naturalistic evolution to be a scientific theory, each of three components must be a scientific theory. They are: (1) the naturalistic evolution of the first cell; (2) naturalistic microevolution; and (3) naturalistic macroevolution.

certain facts or to provide a basis for further investigation."²⁰ In common usage, a theory is "a speculative idea or plan as to how something might be done, and, popularly, a mere conjecture or guess."²¹ For naturalistic evolution to be a *scientific* theory, each of three components must be a *scientific* theory. They are: (1) the naturalistic evolution of the first cell; (2) naturalistic microevolution; and (3) naturalistic macroevolution.

John Rennie wrote: "The origin of life remains very much a mystery."²² Alvin Plantinga wrote: "(A)t present all such accounts of the origin of life are at best enormously problematic."²³ Since a *scientific* theory cannot be based on a scientific mystery or on enormously problematic accounts, the naturalistic evolution of the first cell cannot be a component of a *scientific* theory of evolution.

Francisco Ayala wrote: "[S]cience relies on observation, replication and experimentation, but nobody has seen the origin of the universe or the evolution of species, nor have these events been replicated in the laboratory or by experiment."²⁴ David Depew wrote: "I could not agree more with the claim that contemporary Darwinism lacks models that can explain the evolution of cellular pathways and the problem of the origin of life."²⁵

A *scientific* theory cannot be based on events that have been neither observed nor replicated, and a *scientific* theory cannot be based on the unknown evolution of cellular pathways. Nor can a *scientific* theory be based on promissory materialism. As noted earlier, naturalistic macroevolution has absolutely no unique and unequivocal supporting data and is an irrational scientific hypothesis. Naturalistic macroevolution is not a component of a *scientific* theory of evolution.

No *scientific* theory of evolution exists because the naturalistic evolution of the first cell and naturalistic macroevolution do not qualify as *scientific* theories. The naturalistic evolution of the first cell and naturalistic macroevolution are actually *ad hoc* hypotheses, because the exact chemical and physical conditions present during specific steps in evolution cannot be known and because no scientific data exist to indicate that a specific mechanism was actually operative for any specific step.

Mayr wrote that evolutionary biology is a historical science based on observation, comparison, and classification²⁶ and that experimentation is inappropriate for understanding the historical progression of evolution.²⁷ He claims that theories in evolutionary biology are based on concepts rather than laws as is the case in the physical sciences.²⁸ The evolutionary biology of Mayr is an ordering and stratification of data, not a *scientific* theory. Further, the observations, comparisons, and classifications taking place in evolutionary biology do not and cannot reveal causative agency.

Intelligent Design and Methodological Naturalism

Many advocates of intelligent design believe that intelligent design is scientific. John Angus Campbell, Director of Graduate Studies in the Department of Communication, University of Memphis, and co-editor of *Darwinism, Design, and Public Education*, wrote:

ID is a science, a philosophy, and a movement for education. As science, ID is an argument against the orthodox Darwinian claim that mindless forces—such as variation, inheritance, natural selection, and time—can account for the principal features of the biological world.²⁹

Part III of this book is subtitled, "The Theory of Intelligent Design: A Scientific Alternative to Neo-Darwinian and/or Chemical Evolutionary Theories."³⁰

Warren A. Nord, who taught the philosophy of religion at the University of North Carolina, Chapel Hill, wrote:

Of course, advocates of ID theory typically claim that it is a scientific theory—at least when science is freed of its philosophical commitment to naturalism.³¹

Most scientists believe that intelligent design is not scientific. Michael Ruse, Lucyle T. Werkmeister Professor of Philosophy at Florida State University, wrote:

[I]t is quite wrong to teach creationism—call it intelligent design or what you will—in science classrooms. Keep it out and put it in the comparative religion or history classes.³²

These quotes reveal a fundamental disagreement over the definition of science. But how is science to be defined? John Rennie wrote: "A central tenet of modern science is methodological naturalism—it seeks to explain the universe purely in terms of observed or testable natural mechanisms."³²

Does the entire physical universe run purely in terms of observed or testable natural mechanisms? In other words, does methodological naturalism describe how the universe works *exclusively* or does it only describe how the universe works *usually*? To claim that methodological naturalism describes how the universe works *exclusively* would require knowledge of the cause of every physical event for the entire history of the universe. Since such knowledge is lacking, methodological naturalism is only a presupposition, which can never be proven.

Both the intelligent design advocate and the methodological naturalist have a minimalist position from which neither will retreat ...

Are these two minimalist positions incompatible? No!

Classically, methodological naturalism differentiated science from technology. In engineering and the applied sciences, scientific data and the scientific method are intelligently used to produce an idea or a product, which would not have occurred naturally. God's activity in the physical world would not be naturalistic but would constitute a supernatural technology. A miracle is the antithesis of a testable natural mechanism. Thus, methodological naturalism describes how the universe runs apart from intelligent input, whether human's or God's.

Natural science requires a reasonable working definition. Alvin Plantinga wrote:

There is dispute as to whether science by its very nature requires methodological naturalism, and there is also dispute as to whether science has a nature. But as commonly practiced, science does seem to be associated with methodological naturalism.³⁴

Methodological naturalism describes how the universe *usually* works and provides the foundation for scientific experimentation. As such, methodological naturalism is a most reasonable definition of natural science, that science which excludes all intelligent input.

If data reasonably approximate the expectations of methodological naturalism, an enterprise can be included within natural science. If the data are highly irrational under the confines of methodological naturalism, the enterprise should be excluded from natural science.

Methodological naturalism excludes intelligent design from natural science. Intelligent design is supernatural applied science and, more specifically, supernatural genetic engineering and supernatural biotechnology. No scientific theory of intelligent design exists. Intelligent design should be promoted for what it really is—a rational explanation for real biological origins and as that explanation which best conforms to the scientific data concerning biological origins.

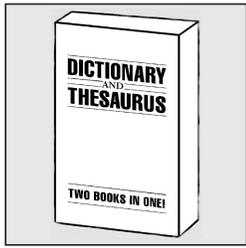
Both the intelligent design advocate and the methodological naturalist have a minimalist position from which neither will retreat. The minimalist position for the intelligent design advocate is that intelligent design is the causal agency of real physical events and real biological origins. Intelligent design is a legitimate component of real biology and, as such, must be included in a public school biology curriculum when biological origins are being taught. The minimalist position for the methodological naturalist is that intelligent design is a supernatural intelligent process, not a natural process. Intelligent design is the antithesis of methodological naturalism and must be excluded from a science curriculum.

Are these two minimalist positions incompatible? No! Stephen Meyer alluded to a possible synthesis when he wrote: "This essay has argued that, whatever its classification, the design hypothesis does constitute a better explanation than its materialistic or naturalistic rivals for the origin of specified biological information."³⁵ Here he treats intelligent design as a hypothesis rather than a scientific theory and opens the possibility of reclassifying intelligent design into something other than science.

Biology: Origins and Systems

The apparent incompatibility of these minimalist positions has to do with the definition of biology. Biology has been misclassified. Scientists classified biology as a natural science. From the smallest grade schools to the greatest universities, biology has been placed among the sciences. We have come to believe, *a priori*, that biology is a part of science. Biology is not a natural science in its *totality*. It needs to be freed from the box created by the natural sciences and by our thinking. Biology has a natural science component and an origins component. A biology curriculum is scientific when it addresses biological systems. A biology curriculum is not scientific when it addresses biological origins.

The biology teacher has two hats: when teaching biological systems, the teacher wears a "scientific" hat;



Biology is not a natural science in its totality. ... Biology has a natural science component and an origins component. A biology curriculum is scientific when it addresses biological systems. A biology curriculum is not scientific when it addresses biological origins.

Article

Needed: A New Vocabulary for Understanding Evolution

when teaching biological origins, a “non-scientific biological origins” hat. Naturalistic microevolution is scientific and would be included in the curriculum on biological systems. The naturalistic evolution of the first cell, naturalistic macroevolution, intelligent design, and progressive creation are explanations of biological origins and would be included in the curriculum on “nonscientific biological origins.”

But, are not both the naturalistic evolution of the first cell and naturalistic macroevolution scientific? No, for both are highly irrational scientific hypotheses.³⁶ Intelligent design and progressive creation are not scientific, because they are the product of supernatural intelligent design and assembly—the antithesis of methodological naturalism. None of the four should be taught in a science class. They could and should be taught in the biological origins component of a biology class. They must all be taught, or none should be taught. Never should one or two be taught to the exclusion of the others.

The division of biology into a scientific component and a nonscientific component should be welcome in public education. It defuses the litigation issue. The biology curriculum would be divided into a scientific component concerning biological systems and into a nonscientific component concerning biological origins. The honest biology teacher would make it clear to her students which hat she is wearing and would conduct the teaching and discussion accordingly. Further, the relationship between naturalis-

tic macroevolution and intelligent design is not one of science vs. religion, but, rather, one of science vs. technology.

Since biological origins are not scientific, they do not belong to the scientist but to the public at large. You do not need to be a scientist to make an intelligent decision about origins. Scientists may generate numbers and provide data, but they must not control the debate. Being a scientist may actually be detrimental, for a scientist is inclined to drag biological origins back into methodological naturalism.

Punctuated Equilibrium and Scientific Theory

The late Stephen Gould stated:

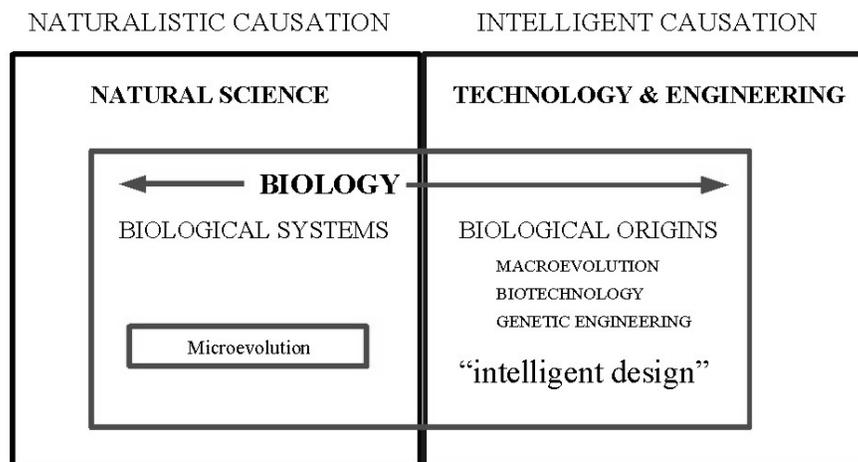
The theory of punctuated equilibrium attempts to explain the macroevolutionary role of species and speciation as expressed in geological time.³⁷

As a central proposition, punctuated equilibrium holds that the great majority of species, as evidenced by their anatomical and geographical histories in the fossil record, originate in geological moments (punctuations) and then persist in stasis throughout their long durations ... in the domain of macroevolution.³⁸

The *scientific* theory of punctuated equilibrium has four fatal flaws.

1. Punctuated equilibrium is the product of a historical science,³⁹ which relies on obser-

BIOLOGY RECLASSIFIED



ventions, not experimentation. As such, the “theory” of punctuated equilibrium fails to meet the criteria for a *scientific* theory. It constitutes, at best, a scientific hypothesis.

2. Data consistent with punctuated equilibrium do not exist for the large majority of species. Gould wrote that the data usually constitute an “unresolvable transition,”⁴⁰ a “missing record,”⁴¹ or “rare stratigraphic situations.”⁴² Punctuated equilibrium, as it applies to most species, is an *ad hoc* hypothesis.

3. Punctuated equilibrium does not reveal causative agency. As noted, fossils do not and cannot reveal the cause of the alteration in DNA, which preceded the change in fossil morphology. Gould recognized this when he wrote: “Therefore, and especially, punctuated equilibrium provides no insight into the old and contentious issue of saltational or macromutational speciation.”⁴³ However, the number of tries available to macroevolution is totally insufficient to consider naturalistic causation as the basis for the fossil record.

4. Punctuated equilibrium is based on circular reasoning, for the foundation of punctuated equilibrium is Darwinian genetic change,⁴⁴ which is synonymous with naturalistic causation, and *standard* evolutionary views.⁴⁵ Thus, punctuated equilibrium is true because naturalistic macroevolution is true, and naturalistic macroevolution is true because punctuated equilibrium is true.

The *scientific* theory of punctuated equilibrium should be given a decent burial alongside the geocentric solar system.

Robust Formational Economy Principle and Causation

The Robust Formational Economy Principle (RFEP) is the concept that the universe came into existence with the built-in potential or “blueprint” to generate life as we know it. It begs the question as to which causal agency brought the universe into existence.

Many scientists accept a RFEP of naturalistic origin. Some theists accept a RFEP of supernatural origin. Though the two are naturalistic in their outworking, they are antithetical in their origin and in their potential. The supernatural generation of a RFEP universe results in a “loaded” universe, which is physical, though of supernatural origin. Scientists can never determine if our universe is “loaded,” since the “load” would be supernaturally obscure.⁴⁶

In a supernatural RFEP, macroevolution follows a supernatural “blueprint.” A lowly bacterium lying in a shallow body of water could be penetrated in an orderly fashion by a million high energy waves, each originating from a different galaxy. Each high energy wave could energize and transform a segment of DNA such that, after the millionth wave passed, the bacterium is left with a segment of DNA, which codes for all the components of a propulsive flagellum.

Conceptually, macroevolution by a naturalistic RFEP, macroevolution by a supernatural RFEP, macroevolution by intelligent design, and progressive creation could each produce the exact same DNA molecule. Such a DNA molecule would not retain any residual, which would provide a clue as to its mechanism of origin. Also, God’s intelligent design is present in the generation of the supernatural “blueprint” of RFEP, in intelligent design, and in progressive creation. The presence of intelligent design does not differentiate between them. The scientific method cannot differentiate between the various possible mechanisms of origin for any particular DNA molecule.

Practical Applications

This new vocabulary provides the foundation for a new understanding of evolution, especially as it pertains to biological origins. As noted previously, comparative studies of DNA, proteins, homologous structures, and fossils fail to reveal causative agency. The same is true of phylogenetic trees and Haeckel’s embryos. Peppered moths and Darwin’s finches are examples of naturalistic microevolution and have no relevance to naturalistic macroevolution or to biological origins.

Genetic engineering involves altering existent DNA and is microevolution by the intelligent design of scientists. Laboratory induced changes in HOX genes is microevolution no matter how bizarre the resulting creature.

This new vocabulary provides the foundation for reevaluating educational requirements. The Commonwealth of Pennsylvania has an *Academic Standards for Science and Technology*. This standard for teaching science includes the requirement, “Analyze the theory of evolution—Examine human history by describing the progression from early hominids to modern humans.”⁴⁷ This requirement contradicts known facts: No *scientific* theory of evolution exists; the mechanisms for the assembly of cellular pathways in the biological origin of modern humans are not known; no data exist concerning causative agency; and the evolution of *Homo sapiens* from a common ancestor with the chimpanzee is not a naturalistic event.

Requiring students to describe “the progression from early hominids to modern humans” has nothing to do with science and everything to do with the promotion of a godless world view. It should be removed from the Commonwealth of Pennsylvania’s *Academic Standards for Science and Technology*.

In conclusion, the new vocabulary radically alters one’s understanding of evolution, biology, and science. It becomes a grid through which data are filtered anew, and it provides a far more accurate understanding of biological origins. ☞

Notes

- ¹Charles Darwin, *The Origin of Species*, Modern Library ed. (New York: The Modern Library, 1993), 612.
- ²Ernst Mayr, *What Evolution Is* (New York: Basic Books, 2001), 287.
- ³John Rennie, "15 Answers to Creationist Nonsense," *Scientific American* (July 2002): 80.
- ⁴Mayr, *What Evolution Is*, 48.
- ⁵R. Lewin, "Evolutionary Theory Under Fire," *Science* 10 (1980): 883.
- ⁶Matthew 22:21.
- ⁷Ernst Mayr, "Darwin's Influence on Modern Thought," *Scientific American* (July 2000): 80.
- ⁸Ibid, 81.
- ⁹Ibid, 82.
- ¹⁰Working Group on Teaching Evolution, National Academy of Sciences, *Teaching About Evolution and the Nature of Science* (Washington, DC: National Academy Press, 1998), 6.
- ¹¹NSTA *Handbook 1999-2000*, National Science Teachers Association (Arlington, VA: National Science Teachers Association, 1999): 206.
- ¹²H. S. F. Cooper, Jr. "The Genome Writ Large" *Natural History* 110 (2001): 79.
- ¹³Mayr, *What Evolution Is*, 237.
- ¹⁴Julia Karow, "Reading the Book of Life," in *Understanding the Genome from the Editors of Scientific American* (New York: Warner Books, 2002), 132.
- ¹⁵H. P. Yockey, "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory," *Journal of Theoretical Biology* 67 (1977): 387; and J. F. Reidhaar-Olson and R. T. Sauer, "Functionally Acceptable Substitutions in Two α -Helical Regions of λ Repressor," *Proteins: Structure, Function, and Genetics* 7 (1990): 315.
- ¹⁶Also, fewer than 1,050 proteins have existed on Earth, for a collection of 1,050 small proteins of one hundred amino acid residues could cover the entire surface of Earth to a depth of 1.5 feet every year for 3.5 billion years.
- ¹⁷National Academy of Sciences, *Teaching About Evolution and the Nature of Science*, 6.
- ¹⁸National Association of Biology Teachers, "Statement on Teaching Evolution," adopted by the Board of Directors, March 15, 1995 and revised October 1997.
- ¹⁹Committee on Science and Creationism, National Academy of Sciences, *Science and Creationism: A View from the National Academy of Sciences* (Washington, DC: National Academy Press, 1984), 9.
- ²⁰D. Guralnik, Editor in Chief, *Webster's New World Dictionary of the American Language*, 2d college ed. (New York: Simon and Schuster, 1984).
- ²¹Ibid.
- ²²Rennie, "15 Answers to Creationist Nonsense," 81.
- ²³Alvin Plantinga, "Creation and Evolution: A Modest Proposal," in *Darwinism, Design, and Public Education*, ed. John A. Campbell and Stephen C. Meyer (East Lansing, MI: Michigan State University Press, 2003), 514.
- ²⁴Francisco J. Ayala, "Arguing for Evolution," *Evolution in Perspective: The Science Teacher's Compendium* (Arlington, VA: NSTA Press, 2004), 1.
- ²⁵David Depew, "Intelligent Design and Irreducible Complexity: A Rejoinder," in *Darwinism, Design, and Public Education*, ed. Campbell and Meyer, 447.
- ²⁶Ernst Mayr, "Darwin's Influence on Modern Thought," *Scientific American* (July 2000): 81.
- ²⁷Ibid, 80.
- ²⁸Ibid, 81.
- ²⁹John A. Campbell, "Why Are We Still Debating Darwinism? Why Not Teach the Controversy?" in *Darwinism, Design, and Public Education*, ed. Campbell and Meyer, xi, xii.
- ³⁰Campbell and Meyer, *Darwinism, Design, and Public Education*, 221.
- ³¹Warren A. Nord, "Intelligent Design Theory, Religion, and the Science Curriculum," in *Darwinism, Design, and Public Education*, ed. Campbell and Meyer, 55.
- ³²Michael Ruse, "On Behalf of the Fool," in *Darwinism, Design, and Public Education*, ed. Campbell and Meyer, 483.
- ³³Rennie, "15 Answers to Creationist Nonsense," 81.
- ³⁴Plantinga, "Creation and Evolution: A Modest Proposal," 522.
- ³⁵Stephen C. Meyer, "DNA and the Origin of Life: Information, Specification, and Explanation," in *Darwinism, Design, and Public Education*, ed. Campbell and Meyer, 271.
- ³⁶A cell containing only ten different types of small, functional, complex, enzymatic proteins assembled from L-isomer, biological amino acids, plus a functioning genetic code, would be far too simplistic to accomplish both metabolic activity and replication. The maximum number of unique proteins or tries available for the assembly of the first cell on Earth would have been fewer than 10^{45} proteins. The mass of the water of hydration for a protein ranges between 10% and 20% of the mass of the protein. Earth contains 1.4×10^{24} grams of water. This amount of water could hydrate 1.4×10^{25} grams of protein at 10% hydration. The mass of 10^{45} proteins, each composed of one hundred amino acid residues, is more than 1.6×10^{25} grams and would have less than a 10% hydration resulting in a thick sludge filling all bodies of water. A collection of 10^{45} proteins could form $([10^{45}]^{10})/10!$ or more than 10^{443} combinations of ten proteins. If every combination of ten proteins formed were to exist for only one second, fewer than 10^{61} combinations would exist in three billion years. The probability of assembling a specific combination of ten proteins in three billion years would be one chance in 10^{382} . No protein could be eliminated prior to assembling into every possible combination with nine other proteins. The random elimination of proteins to make way for new proteins could remove a necessary, functional protein just as readily as a nonfunctional protein. Therefore, the maximum number of unique proteins or tries available for the naturalistic assembly of the first cell on Earth was fewer than 10^{45} proteins. The probability of naturalistically assembling an integrated, functional, complex enzyme of one hundred amino acid residues from an equimolar collection of biological amino acids is about one chance in 10^{65} per try. The probability of finding all ten functional, complex enzymes for the first cell within such a collection of 10^{45} proteins would be one chance in $([10^{20}]^{10})/10!$ or less than one chance in 10^{193} . The best overall probability of ever assembling ten integrated, functional, complex enzymes for the first cell would be the probability of finding all ten functional, complex enzymes for the first cell within a collection of 10^{45} proteins, which is less than one chance in 10^{193} , multiplied by the probability of ever assembling a specific combination of ten proteins, which is one chance in 10^{382} . The product of the two probabilities is less than one chance in 10^{575} . The naturalistic assembly of the first cell on Earth or any place else in the entire universe is an extremely irrational scientific hypothesis.
- ³⁷Stephen Jay Gould, *The Structure of Evolutionary Theory* (Cambridge, MA: The Belknap Press of Harvard University Press, 2002), 766.
- ³⁸Ibid.
- ³⁹Ibid., 761.
- ⁴⁰Ibid., 767.
- ⁴¹Ibid., 769.
- ⁴²Ibid.
- ⁴³Ibid., 768.
- ⁴⁴Ibid., 769.
- ⁴⁵Ibid.
- ⁴⁶Fredric P. Nelson, MD, "RFE and ID Universes Are Both Supernatural," *Perspectives on Science and Christian Faith* 57, no. 1 (March 2005): 76.
- ⁴⁷Pennsylvania Department of Education, *Academic Standards for Science and Technology*, 22 PA Code, chap. 4, Appendix B (January 5, 2002): 13.