# The Evolution Controversy

## Understanding the Basic Issues in the Debate Between Biological Evolution and Intelligent Design

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Published in the United States by Metamorphosis Studios, Inc., P.O. Box 12711, Columbus, OH 43212, (614) 485-8000

# Preface

If you are looking for a brief but substantive discussion of the core issues in the debate over evolution in American education, this publication is for you! We have written this booklet with the non-technical, non-scientific reader in mind. We have minimized the technical terminology and used a conversational style for easy reading, but we have addressed the important scientific information without diluting the content. Our goal has been to clearly communicate the essential arguments in this debate to the general public, to parents and teachers, to school board members and education policy-makers, and to students from the high school level and beyond. We have taken the Ph.D. material and simplified it into everyday language so that you can understand the scientific controversy about evolutionary theory.

A primary motivation for producing this booklet has been the need to correct the typical mistreatment of this issue by the mainstream media and the scientific establishment. Almost without exception, the public portrayal of this debate has been the stereotypical view of "religion vs. science." We think it is time that the debate shifted to the **scientific controversy** over certain aspects of Darwinian evolution. A second, but equally important, impetus for producing this booklet has been the growing body of empirical, observable evidence for design in living systems. Though intelligent design theory is often mischaracterized as an essentially religious theory that adds scientific trappings for credibility, in fact it has grown out of the accumulated empirical evidence that points to **design** (events arranged by a mind with purpose), rather than **natural processes** (chance and natural law), as the cause for the origin and diversity of life.

We trust that this booklet will give you a foundation for the important scientific arguments in this debate. For those who are already skeptical of evolution from a religious standpoint, this short treatise will expand your understanding of the scientific basis for that skepticism. For those who are interested in the evidence that supports intelligent design in the origin and development of life, we offer an introduction to this side of the debate. For all readers, we hope that it will encourage you to learn more about why this controversy is so critical to our society, to our children's future, and to our purpose on earth as human beings.


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The science of origins attempts to answer the question, "Where do we come from?" The answer to this question has profound implications that affect our view of the universe and our moral and religious values. Evolution theory is the reigning paradigm used by most scientists to explain the origin and diversity of life. We believe that biological origins should be taught with objectivity. Evidence that both supports and challenges evolution should be presented, and the naturalistic assumption behind it should be disclosed.

Evolution is a word with numerous meanings. It is sometimes defined as "change over time" or as "minor genetic variation" (microevolution). These definitions are well accepted and are not problematic. A third definition, however, views evolution as the theory that all living things are related by descent with modification from a common ancestry. This is Darwinian evolution, or macroevolution. This is the aspect of evolution theory that has generated much controversy.

Darwinian evolution rests on the fundamental assumption that biological origins can be explained by natural processes (*i.e.*, the laws of chemistry and physics and random chance acting upon matter and energy). Evolutionary biology is a historical science; it attempts to explain events and processes that have already taken place in the distant past. This is different from current-day laboratory science, in which hypotheses can be tested directly by planned experiments. In historical sciences, the only way to "test" a hypothesis is to consider competing explanations. Since evolutionary theory assumes that life came about only by natural causes, it purposely (but wrongly) excludes from consideration any hypothesis that involves intelligent or supernatural causes.

Evolutionary theory as a historical science includes two parts. "Chemical evolution" proposes that the first living organisms arose on the early Earth from chemical reactions and processes involving nonliving matter. "Biological evolution" proposes that all the diversity of life we observe today arose from gradual changes in the initial life forms.

DNA contains coded instructions needed for assembly of proteins in living cells and for carrying out the processes associated with life. The great question to be addressed in determining how life originated is "where did the instructions (*i.e.*, biological information) come from?" This is a great mystery. Biologists have no satisfactory answer as to how this information could have arisen by natural causes. Intelligent sources are the only known entities that can produce such instructions or information.

A large number of biological systems have the characteristic known as "irreducible complexity." An irreducibly complex system (*e.g.*, the bacterial flagellum) has a large number of necessary interacting parts, the removal of any one of which causes the system to cease its function. Gradual Darwinian mechanisms do not have the capacity to generate irreducibly complex systems. This suggests that purposeful design by intelligence is a more likely explanation for their origin. Living systems are in many ways analogous to human-made machines. Since we know that mechanical machines are made by intelligent engineers, it is reasonable to infer that "living machines" are also the product of intelligent design.

If evolution is the true explanation for the diversity of life, then there must be one or more naturalistic mechanisms that are capable of generating new features (novel body plans and body parts). Natural selection and genetic mutation, the primary Darwinian mechanisms, have not clearly shown themselves capable of generating these new features. A more reasonable explanation of new features would be design by intelligence.

The three major types of evidence that are used to support evolutionary theory (macroevolution) are the fossil record, homologies, and embryology. The principal features of the fossil record are the abrupt appearance of new species (*e.g.*, the Cambrian explosion), stasis (equilibrium) over long periods of time, and then extinction. This discontinuous pattern is more consistent with the theory of intelligent design.

Homologies are similarities in structure and form among different organisms. Homologies may suggest either a common ancestry or design on a common plan (archetype), depending on how the evidence is interpreted. The argument from embryology proposes that similarities in the stages of developing embryos from different species suggest a common ancestry. However, the findings of modern embryology show that embryos from different organisms are different at all stages of development.

Overall, macroevolution is only about 5% of a typical biology curriculum. Thus it is relatively easy to modify

this part of the curriculum. We believe that a "critical analysis" or "teach the controversy" approach is the best way to present biological origins in an objective, unbiased manner. This calls for (a) teaching the evidence supporting and challenging biological evolution (common descent); (b) permitting, but not requiring, teachers to discuss alternative theories (like intelligent design); and (c) adopting a definition of science that allows for consideration of all logical and reasonable explanations for phenomena in nature.

With regard to teaching the evidence, we suggest that at least three types be covered – fossils, homologies, and embryology. Modern definitions of science are typically naturalistic, *e.g.*, science is finding "natural explanations for natural phenomena." Students should know that this type of definition is controversial, and that science also has the capability to empirically detect when non-naturalistic (*e.g.*, intelligent) causes may be at work. We believe that teachers should have the freedom to discuss scientific alternatives to evolution, if they so choose, and that they should not be required to provide only a "natural explanation" of how life arose on earth.

Teaching both sides of the biological origins debate has numerous benefits, including intellectual honesty, academic freedom, critical thinking, consistency with new federal law, and support of the principle of government neutrality toward religion. Public opinion polls have also shown that the great majority of Americans support this objective approach.