

This document includes two separate articles. One argues against the idea of Intelligent Design, and the other argues for the idea.

Article 1: Intelligent Design Is Unscientific

American Association for the Advancement of Science, “Q & A on Evolution and Intelligent Design” 2005. Reprinted with permission.

"Whether there is an intelligent designer is a matter of religious faith rather than a scientifically testable question."

In this viewpoint the American Academy for the Advancement of Science (AAAS) contends that the consensus among scientists is that the theory of evolution is sound and that intelligent design theory is not scientific. According to the organization, the central tenets of the intelligent design theory—which postulates that an intelligent designer created life—cannot be tested, which all theories must be in order to be considered scientific. AAAS argues that teaching intelligent design in school confuses science with religion, thereby undermining the teaching of science. AAAS, an international organization dedicated to advancing science, publishes *Science* magazine.

As you read, consider the following questions:

1. What does the word *theory* mean in science, according to AAAS?
2. According to AAAS, what research on intelligent design has been published in relevant scientific journals?
3. What does AAAS say are the two hypothetical claims made under intelligent design theory?

What is evolution?

Evolution is a broad, well-tested description of how Earth's present-day life forms arose from common ancestors reaching back to the simplest one-celled organisms almost four billion years ago. It helps explain both the similarities and the differences in the enormous number of living organisms we see around us.

By studying the sequence of changes in fossils found in successive layers of rock as well as the molecular evidence provided by modern genetics, scientists have been able to trace how ancient organisms—through a process of descent with modification—gave rise to profound changes in populations over time. Many new anatomical forms have appeared, while others have disappeared. In a very real sense, we are distant genetic cousins to all living organisms, from bacteria to whales.

Evolution occurs in populations when heritable changes are passed from one generation to the next. Genetic variation, whether through random mutations or the gene shuffling that occurs

during sexual reproduction, sets the stage for evolutionary change. That change is driven by forces such as natural selection, in which organisms with advantageous traits, such as color variations in insects that cloak some of them from predators, are better enabled to survive and pass their genes on to future generations.

Ultimately, evolution explains both small-scale changes within populations and large-scale changes in which new species diverge from a common ancestor over many generations.

"Theory" Defined

Is evolution "just a theory?"

In detective novels, a "theory" is little more than an educated guess, often based on a few circumstantial facts. In science, the word "theory" means much more. A scientific theory is a well-substantiated explanation of some aspect of the natural world, based on a body of facts that have been repeatedly confirmed through observation and experiment. Such fact-supported theories are not "guesses" but reliable accounts of the real world. The theory of biological evolution is more than "just a theory." It is as factual an explanation of the universe as the atomic theory of matter or the germ theory of disease. Our understanding of gravity is still a work in progress. But the phenomenon of gravity, like evolution, is an accepted fact.

Is there "evidence against" contemporary evolutionary theory?

No. There are still many puzzles in biology about the particular pathways of the evolutionary process and how various species are related to one another. However, these puzzles neither invalidate nor challenge Darwin's basic theory of "descent with modification" nor the theory's present form that incorporates and is supported by the genetic sciences. Contemporary evolutionary theory provides the conceptual framework in which these puzzles can be addressed and points toward ways to solve them.

Is there a growing body of scientists who doubt that evolution happened?

No. The consensus among scientists in many fields, and especially those who study the subject is that contemporary evolutionary theory provides a robust, well-tested explanation for the history of life on earth and for the similarity within the diversity of existing organisms. Very few scientists doubt that evolution happened, although there is lively ongoing inquiry about the details of how it happened. Of the few scientists who criticize contemporary evolutionary theory, most do no research in the field, and so their opinions have little significance for scientists who do.

The Theory of Intelligent Design

What is intelligent design?

"Intelligent design" consists of two hypothetical claims about the history of the universe and of life: first, that some structures or processes in nature are "irreducibly complex" and could not

have originated through small changes over long periods of time; and second, that some structures or processes in nature are expressions of "complex specified information" that can only be the product of an intelligent agent.

Is intelligent design a scientific alternative to contemporary evolutionary theory?

No. Intelligent design proponents may use the language of science, but they do not use its methodology. They have yet to propose meaningful tests for their claims, there are no reports of current research on these hypotheses at relevant scientific society meetings, and there is no body of research on these hypotheses published in relevant scientific journals. So, intelligent design has not been demonstrated to be a scientific theory. While living things are remarkably complex, scientists have shown that careful, systematic study of them can yield tremendous insights about their functions and origins (as it has in the past).

Intelligent design necessarily presupposes that there is an "intelligent designer" outside of nature who, from the beginning or from time to time, inserts design into the world around us. But whether there is an intelligent designer is a matter of religious faith rather than a scientifically testable question....

Stifling Debate?

Are scientists trying to stifle discussion of intelligent design?

We do not want to censor discussion of intelligent design in the proper setting but the school science classroom is not that setting. Nor do we want to portray evolution as some carved-in-stone dogma. Science is an ongoing process, with new evidence accepted and weighed constantly. Intelligent design advocates have yet to contribute in a scientifically rigorous manner to that process.

AAAS [American Academy for the Advancement of Science] has worked hard to guarantee that children get a first-class science education. We've helped set the objectives for what should be taught and learned in science classrooms. We want to prevent an erosion of the quality of science education. In the case of Kansas, that would be unfortunate at a time when the state is trying to attract high-tech industry and it, like other U.S. states, is trying to nurture more homegrown science talent.

Are science and religion inherently opposed?

No. Science does not take a position on an intelligent designer, which is a matter of religious faith, and is not testable scientifically. AAAS and other scientific groups do not want to create the impression that religion and science are inherently in conflict. They live together quite comfortably, including in the minds of many scientists.

Science and religion ask different questions about the world. Many individual scientists are deeply religious. They see scientific investigation and religious faith as complementary components of a well-rounded life.

Can science stimulate religious thought?

Yes. A particular religion's understanding of the world provides the context from which questions of meaning emerge. A development in science may provide a new more reliable explanation of the structure and processes of the world. This may be different from the understanding of the world that is presumed in a particular religion. What may appear to be a conflict between science and religion is actually a contrast between earlier and more recent understandings of the world (e.g., between an earth-centered universe and a sun-centered universe) and can be a constructive stimulus for religious inquiry. In fact, Jewish, Christian, Muslim, Buddhist and Hindu scholars have sought positive ways to relate evolutionary theory with their religious traditions.

Is the science classroom the appropriate place to discuss the religious interpretations of science?

No. Religion is a subject of inquiry in historical, philosophical and social studies, not in science. So, discussion about religion is most appropriate in the social studies or humanities curriculum, not in the science curriculum.

How Powerful Is the Intelligent Design Movement?

Have scientists underestimated the impact of the intelligent design movement?

Many scientists probably have been caught unawares, in part, because they don't see an inherent conflict between science and religion. They often are more comfortable in the laboratory doing science and communicating it to students, than they are in the public arena. But it is clear they can no longer afford to ignore the political reality of the intelligent design movement and its effort to sway school boards and curriculum committees in many states and communities. The AAAS is determined to remain engaged on this issue and encourages other scientific groups to do so as well, particularly at the grass roots level.

What are the stakes?

The risk, if intelligent design is incorporated into school curricula, is to undermine scientific credibility and the ability of young people to distinguish science from non-science. And that is what matters more, in the longer term, than the specific battles over intelligent design versus evolution. In Kansas, advocates of "intelligent design" are attempting to redefine what is and is not science, in direct conflict with the science standards recommended by both the National Academy of Sciences and AAAS in earlier work. They are pushing the board to reject a definition that limits science to natural explanations for what's observed in the world. They want to define it so that science will include supernatural explanations.

Article 2: Intelligent Design Is a Scientific Theory

Intelligent Design and Evolution Awareness Center, "The Science of IDEA," *www.ideacenter.org*, 2006. © 2006 IDEA Center. Reproduced by permission.

"Because these structures exhibit complex-specified information, a quality known only to be produced by intelligent agents, we conclude that these irreducibly complex structures are intelligently designed."

The Intelligent Design and Evolution Awareness (IDEA) Center is an organization dedicated to promoting intelligent design on its scientific merits. In this viewpoint, IDEA argues that complex biological structures, such as microbiological machines, are best explained by an intelligent cause because they have the same machinelike structural and informational properties found in things commonly known to be designed by intelligent agents. Much of the complexity observed in the natural world, says IDEA, is best explained by the action of intelligence.

As you read, consider the following questions:

1. Does intelligent design, as described in this viewpoint, depend upon the idea of God?
2. The explanatory power of evolution theory is, according to IDEA, limited primarily to what type of processes?

Intelligent design is a scientific theory which says that some aspects of nature are best explained by an intelligent cause. Intelligent design begins with observations about how intelligent agents act when they design things. In short, intelligent design theory makes inferences based upon observations about the types of complexity that are produced by the action of intelligent agents.

Observing the Natural World

Intelligent design begins with observations about the types of information that we observe being produced by intelligent agents in the real world. Even the atheist zoologist Richard Dawkins says that intuitively, "[b]iology is the study of complicated things that give the appearance of having been designed for a purpose." Dawkins would say that natural selection is what actually did the "designing," however intelligent design theorist Stephen C. Meyer rightly notes that, "[i]ndeed, in all cases where we know the causal origin of 'high information content,' experience has shown that intelligent design played a causal role." Thus, like any true scientific theory, intelligent design theory begins with empirical observations from the natural world.

When intelligent agents act, they tend to produce high levels of "complex-specified information" (CSI) and in our experience, complex-specified information is always the product of the action of intelligent design. From observing intelligent agents in the natural world, we know how to produce machines containing high levels of complex and specified information. CSI is a mathematical concept employed by William Dembski, philosopher/mathematician. In our

experience, CSI is always the product of ID. The origin of CSI cannot be explained by any naturalistic process, such as evolution.

To better understand complex specified information, consider this analogy: If you saw a mountainside in South Dakota bearing a striking resemblance to four famous presidents, you would not be tempted to comment "Look what the wind and rain did!" It would be clear that the likenesses arose by design, even though you did not see the design occur, and know nobody claiming to be the sculptor. We intuitively recognize the mountainside was designed because it contains complex information (the shape of the mountainside) that conforms to specific pattern (the likeness of the presidents).

Complexity Suggests a Designer

When we look at biology, very complex machine-like entities exist, which must be exactly as they are, or they cease to function properly. They have CSI because they are specified in that they conform to a particular pattern of arrangement organization which is necessary for them to function, and complex because they have an unlikely arrangement of many interacting parts.

The high level of complex-specified information in these biological machines makes them "irreducibly complex": they have many interacting parts (making them complex) which must be EXACTLY as they are in order for the machine to work properly (making them specified). In irreducible complexity, any change in the nature or arrangement of these parts would destroy their function and make the machine stop working. They are irreducibly complex in that they could not be any less complex and still function. Importantly, irreducibly complex structures cannot be built up through a Darwinian evolutionary process, because Darwinian evolution says that a biological structure must be functional along every small-step of its evolution, and "reverse engineering" of these structures shows that they cease to function if changed even slightly.

Because these structures exhibit complex-specified information, a quality known only to be produced by intelligent design, we conclude that these irreducibly complex structures are intelligently designed. There is also no known natural mechanism to explain the origin of these "irreducibly complex" biological structures, firming up the inference to design.

In all of this, there have been no mentions of God, religion, or adherence to any religious text but rather intelligent design is seen to rely solely upon observations about how intelligent design works in the present to look at aspects of the natural world to see if they were designed. Intelligent design theory is based solely upon applying observations about intelligent action and principles of information theory to the construction of biological systems, and nothing more. There is nothing mystical, supernatural, religious, or non-scientific about intelligent design theory. Intelligent design theory makes no statements beyond which are possible to make using inferences from the available observations of the natural world. The IDEA Center believes that intelligent design is a potent and compelling scientific theory which can explain the origin of much of life on Earth.

For more information about intelligent design theory please see:

- Intelligent Design Theory in a Nutshell
- The Science Behind Intelligent Design
- Introduction to Intelligent Design
- Intelligent Design Jargon Explained
- Evidence for Design of the Universe through Anthropic Principles

Deficiencies in Naturalistic Explanations of Life's Origins

The IDEA Center believes that there are many problems with naturalistic explanations for the origin and diversification of life. Naturalistic explanations are those which assume that there were no forces involved in the history of life other than matter, energy, and the chemical and physical laws governing their interactions. Naturalistic explanations assume that there were no intelligent agents which could have influenced life in the past.

To explain very briefly, problems in naturalistic explanations go down to the very beginning of the universe. There is no explanation for the "fine-tuning" of the physical laws of universe which allows life to exist and flourish on Earth. Models for the natural chemical origin of life face major evidential problems, such as how a "primordial soup" might have formed, or how the irreducible complexity of the simplest cell could arise.

Once life does form, the fossil record indicates that biological complexity typically appears with a "bang" and that rapid increases in biological diversity stretch Darwin's theory of evolution beyond what can be accounted for through naturalistic mechanisms of evolutionary change. Furthermore, there appear to be few plausible examples of transitional forms in the fossil record, a major line of evidence counting against naturalistic evolutionary transitions in the history of life.

Many lines of evidence that supposedly support a natural evolutionary history seem to be deficient. Methods of producing evolutionary family trees or "phylogenies" provide weak evidence for common descent as comparisons of different characteristics commonly lead to conflicting trees. Developmental biology is forced to resort to extreme examples of convergent evolution as supposedly analogous body parts are produced by the same genes in different organisms! Similarly many supposedly "homologous" organs are produced via different developmental pathways, bringing into question claims of evidence for common ancestry. Additionally, many development biologists have accepted that a famous line of evidence supposedly supporting evolution, the notion that "ontogeny recapitulates phylogeny" (the development of an organism replays its evolutionary history), is not supported by developmental data.

Perhaps most importantly, many recently-discovered examples of biological complexity exhibit "irreducible complexity" which could not be built in the step-by-step manner envisioned by Darwin. As our understanding of the cell expands, it is becoming increasingly apparent that Darwinism is incapable of explaining the origin of much biological complexity. This increased knowledge is also forcing scientists to discard what once were thought to be examples of genetic "junk DNA" and vestigial organs which supposedly provide evidence of an undesigned naturalistic evolutionary history. Current trends in biology are revealing complexity beyond that

which evolution can produce—the cell is a finely tuned micro-city reflecting what we would expect to be produced by intelligent design.

The IDEA Center believes that naturalistic explanations have their place in explaining the origin of some biological complexity. Evolutionary theory does have some explanatory power, and its useful scope is primarily limited to microevolutionary processes. However, for the most part, naturalistic explanations are incapable of accounting for much of life on Earth.

For more information about problems with naturalistic explanations for the origin and diversification of life, please see:

- Problems with the Origins of Life
- Evolution Primer
- Problems with Evolutionary Explanations of the Fossil Record
- Irreducible Complexity
- Evolution and the Problem of Non-Functional Intermediates
- Design vs. Descent: A War of Predictions

Darwinism, Naturalism, and Materialistic Philosophy

The fact that science supports a theory which fails to explain so much of the data can only be explained by the fact that a philosophy is preventing scientists from considering new ideas to explain the origin and diversification of life. This philosophy is called "materialism" and it holds that there were no forces involved in the history of life other than matter, energy, and the chemical and physical laws governing their interactions. Naturalistic explanations often assume that there were no intelligent agents which could have influenced life in the past.

We believe that science should follow the evidence wherever it leads, and should not be constrained by any philosophical presuppositions. Natural explanations may indeed be the best way to explain the origin and diversification of life on Earth. But such hypotheses should be tested—and not assumed. If they are tested with a skeptical mindset, then investigating the origins of life becomes an exciting endeavor where we can test between intelligent design theory and other mechanistic theories of life's origins. The IDEA Center hopes to contribute to this debate and encourage others to participate in this investigation.