

Why We Shouldn't 'Teach the Controversy' in Science

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Abstract

There is a controversy raging in the United States between proponents of the theory of evolution and advocates of special creation/intelligent design (ID). Evolution is the unifying theory of the life sciences and evidence supporting evolution comes from repeatable experimentation and observation. ID is a type of special creation, which is based on the Biblical creation account. Evolution and special creation are complex, formal, abstract concepts soundly understood by few.

The current evolution-ID controversy stems, in part, from a lack of scientific literacy among citizens. Scientific literacy requires content knowledge and an understanding of the processes by which content is discovered. Teaching the controversy in the science classroom is inappropriate because there is no scientific support for ID. The differences between evolution and intelligent design should not preclude dialogue between supporters of each.

Introduction

Science and Faith: The Great Matter was the title of the Oxford Round Table on July 23-28, 2006. The participants were a group of scientists, philosophers, theologians, science educators and highly decorated high school science teachers.

Many understandings and conclusions emerged from our presentations and discussions. For example, some suggested that we avoid the controversy associated with evolution and special creation. Some suggested that we confront the controversy. Our data from the Round Table show that our audiences misunderstand or hold incomplete understandings of evolution and special creation, often referred to as intelligent design (ID) today. As educators representing elementary school through college, our audiences are children, adolescents, college students and other adults; we know from experience and research (Round Table Proceedings, in press) that most of our students do not understand evolution or special creation.

Also, we are unconvinced that a single course devoted to evolution, or separate studies devoted to special creation, will result in understandings of either, let alone the associated controversy raging (*in the United States*). Evolution and special creation are complex, formal, abstract concepts soundly understood by few. Furthermore, trying to reconcile a union between the factually based theory of evolution and the biblical presentations of special creation is difficult and unlikely. So, do we confront the controversy and if so, how?

Following are: a) a description of evolution and the controversy from scientists' perspectives, b) a description of special creation, intelligent design and the controversy from a creationist's perspective, and c) what should be included and excluded in school science curriculum from a science teacher's perspective.

Evolution and the Controversy

The theory of evolution is an explanatory model incorporating theoretical, mathematical, and factual evidence into a coherent explanation of variability within and among populations. The theory consists of a pattern (evolution) and the processes (natural selection, genetic drift, gene transfer, and mutation) by which the pattern occurs. Evolution, which is change in the form of individuals over many generations, is the temporal pattern that definitely occurs; it is factual evidence. Natural selection is the process, from one generation to the next, by which organisms best adapted to the environment increase in number compared to less well-adapted organisms (Freeman & Herron, 2004). Genetic drift, gene transfer, and mutation provide the genetic variation that may or may not result in a beneficial adaptation. The theory of evolution incorporates the patterns and processes identified by observation and experimentation into a single scientific theory.

But what is a scientific theory? A scientific theory is a proposed explanation of some natural occurrence that has survived rigorous scientific testing without being refuted. A good theory must a) unite a wide range of observations into a single explanatory framework, b) produce predictions of future observations and c) be testable and potentially refutable (Popper, 1965; Kneller, 1978).

For almost 150 years, evolution has met the criteria of a scientific theory. It is considered the unifying theory of the life sciences, for it brings together a wide array of observations into an explanatory framework (Freeman & Herron, 2004). Evolutionary theory has produced testable predictions of future observations. Numerous discoveries and advances in applied fields, such as medicine, agriculture, energy and resource exploration, and conservation biology, result directly from applications of evolutionary theory. Much of our current technology would not have occurred without the theory of evolution, for example, the development of improved agricultural crops and pesticides, and advances in treatment of diseases such as AIDS. While scholars may

disagree over specific evolutionary mechanisms, there is no disagreement over the validity of the theory as a whole.

Nevertheless, controversy over teaching evolution in public schools continues, most recently with the advent of intelligent design. The current evolution-ID controversy stems in part from a disconnection of society from science. This disconnection is national in scale and reflects a) the public's disengagement from science and b) the failure of scientists and educators to provide to the public an understanding of science as a process rather than a body of memorized facts. The lack of scientific literacy within the general public is exacerbated by the rapid increase in the amount and complexity of scientific information and the failure of the U.S. educational system to effectively link learning goals and assessment tools (Webb, 1997). As a result, few understand the meaning of a scientific theory, even fewer understand the theory of evolution (Gould, 1981); and most people misunderstand, and misuse the term, 'theory'.

Two other societal forces, religious beliefs and conservative political pressures, are becoming increasingly interrelated. Many Americans cannot reconcile their religious beliefs with the theory of evolution and may be against evolution more because of what they think it represents (eroding of moral values) than because of what the theory truly is (Ruse, 2005). Although there is no controversy between evolution and creationism among scientists, proponents of ID advocate teaching the controversy (Sprackland, 2005).

Teaching the controversy in the science classroom is inappropriate because there is no scientific support for intelligent design. Conversely, evolutionary theory was incorporated into biology textbooks only after surviving decades of rigorous scientific testing. In this sense, the theory of evolution has gone through the same process as other scientific theories found in textbooks, such as atomic theory and the theory of plate tectonics. Teaching the controversy between evolution and ID calls into question the very nature of scientific investigation, and threatens to weaken the teaching and practice of science.

The theory of evolution must remain an integral part of science education and should be part of a concerted effort to raise the scientific literacy of our populace. As part of this effort, science curricula must include only concepts well supported by scientifically sound testing and observation. Scientists and science educators must address the current controversy in terms of the process by which scientific theories are derived, while avoiding the temptation to focus blame

for the controversy on religious beliefs. While religious beliefs and related political pressure play roles, especially with respect to teaching evolution at the K-12 level, it is imperative that scientists and educators assume some responsibility. Improving science education will aid the citizenry as it struggles to find common ground in this debate, and will serve as a foundation to enhance our country's global technological and economic status.

Special Creation, ID and the Controversy

What is the origin of the universe and all living things? Throughout history humankind has struggled with answering this question. The only two choices are evolutionary science and the Biblical story of special creation. Intelligent design, which is promoted today, is an offshoot of special creation. So what then is special creation? While there are many variations to the basic theme (i.e. young earth creation, old earth creation, and evolutionary creationist), the following are fundamental premises of special creation, ID and the controversy.

Special creation's original source of information is the revelation of the creation account in the Bible. The Bible has been examined, probed, tested, and challenged and has withstood the close scrutiny to remain accepted by large numbers of people today. Special creation is not scientific and, while many scientific observations are evident, much of the evidence is philosophical or theological. Special creation begins with "In the beginning God created heaven and earth." (Genesis 1:1, King James). It reaffirms this event in many other places, such as "...for in six days the Lord made heaven and earth and all that in them is..." (Exodus 20:11, 31:17). This serves as the basic platform of the origin of everything and is accepted by its supporters because of internal and external evidences that are used to confirm the Bible's accuracy. Examples of such evidence include the Bible's historicity, its claim of inspiration, and its unity of theme and plan. Although written by more than 40 authors over 1,200 years, the Bible's scientific foreknowledge, geographic and archaeological accuracy confirm it for its believers. Archeologist William F. Albright says this, "There can be no doubt that archeology has confirmed the substantial historicity of the Old Testament tradition" (Albright, 1941). With the belief that the Bible is God's revelation to humankind, supporters of special creation then apply science to understand the universe around us and see within it the evidences of the creation. Some physicists and astronomers believe that the conditions necessary to bring the universe to its present state are so delicately and precisely balanced that it is very difficult to

imagine its occurrence without an uncaused first cause. This is called the Anthropic Principle and has many people believing there must be some intelligence controlling everything. As biochemists learn more about cellular metabolism and enzyme activities within even the simplest of life forms, they realize the amazing complexity. This complexity, along with other natural wonders (i.e. symbiotic relationships, migratory abilities, and even life itself) serves as evidence of a Creator for those accepting the Biblical account of creation.

Most supporters of special creation accept many different scientific observations to support their beliefs. These include many of the microevolutionary principles such as population genetics, genetic drift and gene flow. Special creation and ID supporters feel that all living things reproduce after “its kind” (Genesis 1: 11, 21, 24) and that limited changes do occur within a species (i.e. bacterial resistance to antibiotics), but that the specific genome of an organism remains basically unchanged. This is seen in fruit flies as observed by Frances Hitching, “Fruit flies refuse to become anything but fruit flies under any circumstance yet devised” (Hitching, 1982 pp. 61).

Much of science depends on the extrapolation from current observations to events unobserved by humans. This is where the special creation and ID supporters challenge the conclusions of evolutionists. Creationists readily admit that there are scientific observations that are hard to explain, such as what God is or how life came about, but they do not feel these questions are strong enough to overwhelm the incredible number of observations that do fit within the special creation framework in the Bible. Therefore, supporters of creation make a philosophical choice to rest their faith in evidence that has stood for thousands of years.

Evolution, Special Creation/ID and the Public School Science Curriculum

Recommendations and conclusions regarding evolution, special creation and the school science curricula are presented in each of the two previous sections. We expand upon those recommendations through the following discussion of the National Research Council’s *National Science Education Standards* (NRC, 1996). The *National Science Education Standards (NSES)* is a book by the National Academy of Sciences that contains standards for science teaching, professional development, assessment, science content, science education programs, and science education systems.

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The *NSES* reveals that the following concepts and topics are to be presented, in varying degrees, at each of the three sets of grade levels (K-4, 5-8, 9-12): a) survival and reproductive success of organisms, b) the gradual nature of anatomic change, c) natural selection, d) geologic time, e) the fossil record, and/or f) extinction of species (NRC, 1996, pp. 103-208). Additionally, this subject matter is to be experienced through inquiry based activities. Inquiry based experiences in science preclude consideration of concepts that are considered by the *NSES* to be “explanations on how the natural world changes based on myths, personal beliefs, religious values, mystical inspiration, superstition, or authority.” These latter topics “may be personally useful and socially relevant, but they are not scientific” (NRC, 1996, pp.201).

Consequently, the question of whether or not to include special creation, or its offshoot ID, in the science curriculum should be answered in the negative. The inability of students to directly engage these topics through inquiry based education (NRC, 1996, pp. 201) dictates that special creation and ID be excluded from the science curriculum at each grade level. Unlike the theory of evolution, the lack of well-documented and repeatable experiments, as well as the general lack of acceptance by members of the scientific community has, at least for the present time, disqualified special creation and ID as a science. The *NSES* (pp. 201) acknowledges the need for evidence to validate scientific concepts.

We do not believe that the curricular inclusion of evolution will or should interfere with a particular personal belief or religious or social ideologies. As stated in the *NSES*, “Scientists are influenced by societal, cultural, and personal beliefs and ways of viewing the world. Science is not separate from society but rather science is a part of society” (NRC, 1996, pp. 201). As a consequence, it may be that the proper venue in which to discuss the key issues that separate these topics (evolution vs. special creation/ID) will never be identified to the satisfaction of all parties involved in this debate. However, we believe that for any effective dialogue, it is imperative that we actively and openly explore the fundamental concepts that define evolution and special creation/ID.

Endnote

The differences that exist between evolutionary theory and special creation/ID are considerable. However, such differences should not preclude the opportunity for any future dialogue among supporters of evolutionary theory and special creation. In the words of Albert

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Einstein, “Science without religion is lame. Religion without science is blind” (Einstein, 1954). While the possibility of achieving universal agreement is remote, such an unlikely event should not interfere with educating the general public on the ideas that serve as the foundation for each of these schools of thought.

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