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# ***ANALYSIS OF TEACHING ABOUT EVOLUTION AND THE NATURE OF SCIENCE***

National Academy of Sciences publication released April 9, 1998

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## **ABSTRACT:**

On April 9, 1998, the National Academy of Sciences released a publication entitled: *Teaching About Evolution and the Nature of Science*. In the news release announcing that publication they stated that "public school students receive little or no exposure to the theory of evolution..." This Analysis discredits that remark. The news release went on to state that the guidebook's purpose was not to "refute those who oppose the teaching of evolution." However, in the preface of the book, the theme of the text is made clear: If you believe that Creator God made all things in the beginning, or if you even believe in some sort of "intelligent design" you are not intelligent and have no understanding of science or scientific concepts.

Even researchers E.J. Larson and L. Witham, who surveyed the top natural scientists concerning their beliefs in God reported that although *Teaching about Evolution...* states: "There are many very outstanding members of this academy [NAS] who are very religious people, people who believe in evolution, many of them biologists," that statement would suggest that many NAS scientists believe in God. Larson and Witham state: "Our survey suggests otherwise."

The NAS book was written to be used side-by-side with the National Science Standards. Because the science standards contain little evolutionary instruction for teachers, this book was designed to fill in the gap.

Finally, throughout *Teaching about Evolution...* the topic - evolution - is treated as fact and many pages are spent explaining why evolution is a fact, and defining (and redefining) such terms as "hypothesis", "theory" and even the word "evolution."

This Analysis contains a side-by-side table so you can read what the National Academy of Sciences wants you to know about evolution, and compare that to what the truth is.

Teachers who are not convinced that evolution is a fact, and who have been told that teaching creation is illegal can use this Analysis.

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## **ANALYSIS OF**

# ***TEACHING ABOUT EVOLUTION AND THE NATURE OF SCIENCE***

(National Academy of Sciences publication released April 9, 1998)

**Scientific literacy** (according to the National Science Education Standards - 1995) is

the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity.

- It means that a person can ask, find or determine answers to questions derived from curiosity about everyday experiences.
- It means that a person has the ability to describe, explain, and predict natural phenomena.
- Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions.
- Scientific literacy IMPLIES that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it.
- Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately.

*A short analysis of the U.S. Science Standards appears at the end of this document.*

**On April 9, 1998**, the National Academy of Sciences (NAS) released a document that will enable teachers the ability to eliminate what the Academy believes is the "lie" of intelligent design in the creation or origin of the universe and all that is contained in that entity. Because of the release of that document (along with the original press release), this analysis was written. This book (*Teaching about Evolution...*) is designed to be used with the National Science Standards.

Since first writing this comparison/analysis in mid-April 1998, there has been a greater opportunity to review public school science textbooks. Other than *Of Pandas and People*, no other textbook has surfaced that even alludes to the possibility of intelligent design in the origin of the universe.

This treatise is not "scientific" *per se*. Rather, it is based on the premise that *Teaching about Evolution ...* is a political statement by the National Academy of Science and therefore this analysis, comes from that perspective.

One thing must be realized: ALL scientific investigation is based on **bias**. To say that one "theory" is better than another "theory" is based on the **bias** or the assertion of the writer (or scientist). To say that evolution MUST be taught because it is the ONLY scientific explanation for the origin of all life is based on **bias** - the **bias** of those who *believe* that life came from a single cell and evolved into the life we see all around us today. That **bias** can no more be proven than can the **bias** of someone who believes that an intelligent Creator God made all life as we see it today. The difference is that their **bias** includes some scientific "evidence." On the other hand, those, whose **bias** favors a supernatural creation, also inject scientific "evidence" to substantiate their *belief* of and **bias** toward intelligent design.

In Chapter 5 of the book, the National Academy of Sciences attempts to define "evolution" and "creation science." Evolution is defined in several places in this book, however, in Chapter 5 the definition given is "in the broadest sense" as that which "explains what we see today that is different from what we see in the past." Using that meaning, we would say that clothing styles have evolved, automobiles have evolved, food has evolved, nutrition has evolved, etc. - all examples of things which "evolved" because of intelligent design. Where are the examples of what we see today that have "evolved" on their own volition and not because of intelligent design?

The 5<sup>th</sup> chapter continues to explain that "over time, evolutionary change gives rise to new species." In other words, nothing became something, invertebrates became vertebrates, and single-celled organisms became multi-celled organisms. Yet there has been no evidence *in the present* to substantiate that this occurred by change. Evolutionists often appeal to philosophical assumptions from outside science.

*Creation science* is defined as coming from "the conviction that God created the universe, all at once, in the relatively recent past (as is stated in the Bible)." The NAS contention is that many scientists have "examined these ideas" and found them to be non-scientific. However, those scientists who believe that God created everything from nothing, *have* substantiated with scientific evidence over and over that what is stated in the Bible is true. Creationists often appeal to the facts of science to **support** their view, not the other way around.

This book avers over and over that there is a "misconception" that humans evolved from apes by stating that humans and apes have a common ancestor. However, evolutionary paleontologist, G.G. Simpson (deceased), called this "pussyfooting." He wrote: "In fact, that earlier ancestor would certainly be called an ape or monkey in popular speech by anyone who saw it. Since the terms ape and monkey are defined by popular usage, man's ancestors were apes or monkeys. It is pusillanimous [mean-spirited] if not dishonest for an informed investigator to say otherwise."

*Teaching about Evolution...* emphasizes DNA similarities between humans and other living organisms alleging that those similarities are evidence for evolution. This is not, however, a **direct finding**. It is, rather, an **interpretation** of the data. The concept of a **common designer** is another logical **interpretation** for this same data.

If you are a teacher and want more evidence from a scientific perspective on the topics covered in *Teaching about Evolution and the Nature of Science*, Dr. Jonathan Sarfati, of Answers in Genesis (Australia) has written a soon-to-be published book entitled: *Against Indoctrination*. It should be available in the spring of 1999 from Master Books. Other books that can give teachers information on the creation/evolution controversy can be found at the end of this essay. I firmly believe that teachers should also know how an evolutionist thinks and what exactly an evolutionist believes. Therefore, I have listed both creationist books and evolutionist books at the end of this document.

One of the items that must be clarified at the beginning of this treatise is the definition of evolution. *Teaching about Evolution...* defines evolution as change over time. I know of no creationist who would disagree with that definition. However, after telling the reader several times that evolution means change, the document also points out that the meaning of evolution includes the "fact" that humans evolved from apes, by pointing out that humans and apes shared a common ancestor.

What follows is a chart with the text from *Teaching about Evolution and the Nature of Science* QUOTED in the first column, the writer's comments/rebuttals are in the second column, and the cite in the third column. The downloadable version of the document from the internet was used and the citations in the third column reflect those page numbers rather than the page numbers from the book. The text is also available in book form from the National Academy of Sciences for a fee. (See footnote 2 for [http: address.](http://))

**Actual Text**

**Comment**

**Chapter &  
Page**

*Many public school students receive little or no exposure to the theory of evolution...*

Actually the majority (all but one) of the textbooks used in the government schools in science, social studies, and geography, are rife with blatant evolutionary content.

News release (N.R.) , p. 1

Actually, since this report came out in April, I have reviewed several public school science books published for middle through high school students (including, but not limited to: Scott-Foresman, Addison-Wesley, Holt, Prentice-Hall, Houghton Mifflin; Wiley & Sons). All of the textbooks reviewed had chapters dedicated to evolution, and promoted evolutionary theory as fact. Evolutionary theory is also openly presented in middle-school and high school social studies books, and even in math books.

For the NAS to state that public school students receive little or no exposure to the theory of evolution is a blatant lie, and they have to know that it is. Furthermore, while this writer reviewed texts copyrighted from 1996-1998, textbooks copyrighted in the 1950s and 1960s were also reviewed. Each text reviewed had evolutionary content.

*...the most important concept in understanding biology [is evolution]*

The most important concept in understanding biology is NOT evolution.

N.R., p. 1

"Cell theory" is more important. That theory says that all life is composed of cells; that a cell is the basic unit of structure and function,; and all cells come from

other living cells.

The life cycle of plants and animals (including reproduction) should be at the top of the list of concepts as well. Another very important concept would be diseases, how they work, where they come from, etc.

*Teachers are reluctant to teach evolution because of pressures from special-interest groups...*

This is not at all true. Teachers are reluctant to teach creation for fear of (1) losing their job; and (2) because of pressure from special interest groups.

N.R., p. 1

*...even though the Supreme Court ruled in 1987 that creationism is a religious idea that cannot be mandated in public education.*

This is an interesting "spin." While "creationism" may not be **mandated**, the ruling did not say it could not be taught.

N.R., p. 1

*[This book is] to provide educators and policy-makers with tools to help integrate lessons about the scientific theory with basic biology for children in kindergarten through grade 12.*

Tools that are all biased toward an unproven, theoretical point of view.

N.R., p. 1

*Evolution is the central organizing principle that biologists use to understand the world.*

This statement may be true, but that doesn't mean that biologists know the **truth**, or that their biases have given them that understanding. Carol Linneaus (who developed the binomial nomenclature) was a theist; he didn't know or use "evolution" to organize the nomenclatures, he used "kinds."

N.R., p. 1

*Religion and science represent different approaches to understanding the human condition that are not*

While part of this statement is true, evolutionary science and religion (as found in the Bible, Talmud, and Koran) **are** incompatible with each other.

N.R., p. 1

*incompatible with each other.*

*Teaching evolution is essential for explaining some of the most fundamental concepts of science.*

The evolution theory is NOT essential for explaining fundamental concepts of science. Furthermore, none of these fundamental concepts are named. In fact, some of the fundamental concepts defeat the concept of evolution (1<sup>st</sup> and 2<sup>nd</sup> Law of Thermodynamics; Information Theory, etc.).

N.R., p. 1

*Like ALL scientific theories, evolution explains natural phenomena by building logically on observations that can be tested and analyzed.*

AND, ultimately NOT verified. By the way, observations are not "tested," hypotheses are. If the hypothesis is not falsified, over many replications, it is then called a theory.

N.R., p. 1

*The book: summarizes the massive amount of scientific evidence in support of evolution...*

However, it does not discuss any of the evidence against evolution, and how that evidence is part and parcel to the nature of science. The evidence is the same for both sides; it is the interpretation that differs.

N.R., p. 1

*This Guidebook does not attempt to refute the ideas of those who oppose the teaching of evolution.*

Everyone who has heard of the Guidebook knows it has been written exactly for that reason. The entire Guidebook contains blatant references to the "inaccuracies" promulgated by creationists, as well as poking fun at creation "science."

N.R., p. 2

*But scientists do not use the word "theory" to describe an unsubstantiated idea.*

Who does then, just linguists and grammarians? (See below)

N.R., p. 2

An unsubstantiated idea would be "speculation."

*Theories are explanations based on a large body of establish facts.*

Interesting re-definition

N.R., p. 2

*...the scientific community is focused on the details of how evolution occurs, not whether it occurs...* It is **assumed** it occurs. N.R., p. 2  
Furthermore, there are no details of "how."

*The science standards stress the importance of evolution because understanding the theory is essential to mastering basic biology and learning how science works.* Today, however, "scientists" do not use the word "theory" - see N.R., p. 2  
previous paragraph. (See above.)  
Also, to an evolutionist, the theory is substantiated because they **believe** it.

*The teaching of science in ... public schools...is marred by a serious omission...the most important concept in modern biology...biological evolution.* Biological evolution IS taught in government schools. It is Preface, p. 1  
inconceivable that a student would not be taught biological evolution if his textbooks have a whole section (usually three or more chapters) devoted to the topic. That quote is fraudulent.

*People and groups opposed to the teaching of evolution...have pressed teachers and administrators to ... teach evolution as a "theory," not as a "fact."* In my wanderings around this country, and in consult with many of these "groups," it has been my experience that the opposite is true. Preface, p. 1.  
Those who want evolutionary theory taught as fact are the ones who wish to have no other possibility of origins taught. Most "creationists" or "intelligent design" thinkers accept that evolution should be taught right along side creation/intelligent design in order to allow a student to make an intelligent decision as to which is more logical and believable. If the student chooses one or the other, so be it, at least s/he has been given both "theories" (or presumptions) upon which to base his/her decision.

In fact, there are many documented



cases where the ACLU has gone into a school district and threatened legal action if the board does not remove the teaching of intelligent design (not creation) from the district's curriculum, even though evolution was the primary "science" taught.

There are many groups who don't want anything other than evolution taught. Perhaps they fear that questioning the theory might enable students to think for themselves and find out that all that is taught as fact is not true. If they are not afraid of having their evolutionary "facts" questioned, then there should be no problem with permitting a discussion of the "other side" whether it is deemed religious or not.

*The Academy...has sought to counter misinformation about evolution...*

...by ridiculing any other belief regarding origins, including, believe it or not, the "big bang."

Preface., p. 2

*This publication does not attempt specifically to refute the ideas proffered by those who oppose the teaching of evolution in public schools.*

Yes, it does. Otherwise, it wouldn't have been written, and then distributed freely to the public schools in the USA.

Preface, p. 2.

(This same statement is made in the News Release - see pg. 8)

*Most religious communities do not hold that the concept of evolution is at odds with their descriptions of creation and human origins.*

Unfortunately, that statement is true. But that is not the point. However, what the "religious" community believes is irrelevant. Whether MOST religious communities believe, say, that God is dead, does not make it so. And just because most religious communities think evolutionary theory is true, doesn't make it so. Creation is a viable explanation of

Preface, p. 2.

origins and should have equal representation with evolution.

*One source of resistance to the teaching of evolution is the belief that evolution conflicts with religious principles. But accepting evolution as an accurate description of the history of life on Earth does not mean rejecting religion.*

If one accepts evolution (which rejects the a creator or intelligent designer) as fact, then one has to reject the *religious* teaching of the Bible, the Koran, and the Talmud, thereby rejecting religion. The only religion NOT rejected by evolutionism is humanism (which the U.S. Supreme Court has ruled as religion).

Preface, p.  
2

*It is important to ensure that students receive an education in the sciences that reflects this distinction [faith and scientific knowledge are different].*

And so, it must be pointed out that to believe evolution is true takes as much faith as believing that a creator God made all life.

Preface, p.  
2

Furthermore, this statement is in direct opposition to the fact that most of the important scientific discoveries have been made by people with a belief in creator God and that the fundamental concept of scientific activities grow out of their religious tradition.

These scientists believe that the operation of the universe is governed by *orderly* principles. They discovered laws and used them for prediction, calculation, and application. Belief in orderly principles is what sets non-evolutionary thinking apart from evolutionary thinking which is based on chaos.

*The concept of biological evolution ... accounts for the relatedness among organisms by explaining that the millions of different species are related by descent from common ancestors.*

The word "concept" is not defined. However, a dictionary would enlighten anyone interested in what is meant by concept: theory, idea, notion, belief. Concept is NOT fact.

Ch. 1, p. 2

*As organisms grow from fertilized egg cells into embryos, they pass through many similar developmental stages.*

While *Teaching about Evolution...* has no embryo drawings, most textbooks do; and those drawing purportedly show embryos looking very similar. Those drawings are based on the 1874 embryo diagrams by Ernst Haeckel. In 1997, however, a detailed study by Mike Richardson, included actual photographs of embryos of different kinds and they are very distinct, and not similar. This study was widely publicized in science journals. This (NAS) book was published in 1998 and the authors have no excuse for not being aware of Richardson's and other's findings. Their statement, then, is fraudulent.

Ch. 1, p. 2

*Over billions of years...all of the plants, animals, and micro-organisms that exist today...share some of the characteristics of their common ancestors.*

Again, presupposing the time scale being "billions of years." While this is stated as fact, there is no evidence given to validate this supposition. Is it not possible, or conceivable, that the Creator God made all things that exist today to have the same characteristics? (See later explanation of DNA degeneration over time.)

Ch. 1, p. 2

*During the billions of years that life has been on Earth...*

This entire paragraph states a series of "facts", but there are no bridges to connect one "fact" to the next "fact" to arrive at the conclusion.

Ch. 1, p. 3

*...photosynthesis...is a product of evolution.*

Stating a "fact" doesn't make it true. No one was there billions of years ago to verify that these "facts" are true.

Ch. 1, p. 3

Photosynthesis is: the making of soluble plant foods from carbon dioxide and water using energy from sunlight. Light energy is absorbed by chlorophyll.

Evolutionary thinking requires that a person ask: which came first to start the process - the chlorophyll, the sun, the carbon dioxide, the water, or the plant? Has this been answered?

If one of the above is missing, photosynthesis does not happen and if these events occurred over billions of years (or even years), no plants would be here today.

*Evolutionary biology has made many contributions to society. Evolution explains why many human pathogens have been developing resistance to formerly effective drugs and suggests ways of confronting this increasingly serious problem. Evolutionary biology has also contributed to many important agricultural advances by explaining the relationships among wild and domesticated plant and animals and their natural enemies.*

Actually, the fact that living organisms degenerate (mutate) is an explanation. Evolution says that living organisms get better, not worse. Furthermore, developing a resistance to disease and/or drugs is not evolutionary. Creationists would not disagree that organisms build up tolerance to drugs and disease. Furthermore, these discoveries were made by germ biologists, and are based on scientific evidence and principles, not on the study of evolutionary theory.

Ch. 1, p. 4

*Discoveries with important practical applications occur on a regular basis.*

But, not because of evolutionary theory.

Ch. 1, p. 4

*There is no debate within the scientific community over whether evolution occurred...*

Not true. There most certainly is debate over whether evolution occurred. The fact that the NAS wrote a book on teaching evolution proves that there is debate. There are no treatises encouraging the teaching of the atomic theory.

Ch. 1, p. 4

*...There is no evidence*

There most certainly is evidence

Ch. 1, p. 4

*that evolution has not occurred.*

that evolution did not occur. In fact, there is no evidence -- true scientific evidence - it has occurred. Remember evidence must be observed happening. Evolution has never been observed. All evolutionary evidence is presumptive.

*Scientists continue to debate only the particular mechanisms that result in evolution, not over the accuracy of evolution as the explanation of life's history.*

There are many Ph.D. scientists in America alone who debate the validity of Darwin's theory, its mechanisms, accuracy - the explanation of life's history. Ch. 1, p. 4

*[Evolution provides] a superb opportunity to illuminate the nature of science and to differentiate science from other forms of human endeavor and understanding.*

Only if another form of human endeavor and understanding (such as creation) is presented. There can be no differentiation if there is no comparison. Ch. 1, p. 5

*In common usage, theory often means "guess" or hunch."*

But common usage is what people understand. If each discipline has its own meaning for commonly used words, we would create a "tower of Babel", so to speak, and no one would know what another discipline means. Ch. 1, p. 5

This (changing definition to fit the situation) is common practice in the educational community. If a common (dictionary) definition of a term doesn't fit an educationist's desired meaning (outcome), the definition is changed to mean what the educationist wants it to mean. Politicians are also adept at this as well.

*In science, the word "theory" means something*

Webster says: Theory is abstract thought, speculation. a belief, Ch. 1, p. 5

*quite different [from guess or hunch]. It refers to an overarching explanation that has been well substantiated.*

policy, or procedure proposed or followed as the basis of an ideal or hypothetical set of facts. A hypothesis assumed for the sake of argument or investigation. An unproved assumption.

*...concepts are supported by such abundant observational and experimental evidence that they are no longer questioned in science.*

Some of those PARTS of those theories are proven, but the whole "concept" may still be a theory.

Ch. 1, p. 5

*Fact: In science, an observation that has been repeatedly confirmed.*

Webster says a fact is: a thing that has actually happened or is true. What part of the theory of evolution has been confirmed? Can the *assumptions* made to validate the theory be confirmed? No. Can the time-line used to validate the theory be confirmed? No.

Ch. 1, p. 5

Granted, creationists cannot confirm their belief that God created all life. More and more, however, scientific "fact" validates creationists' hypotheses.

*Law: A descriptive generalization about how some aspect of the natural world behaves under stated circumstances.*

Actually, a law is NOT a generalization, but a definitive statement of how things behave. Even the children's book, *The Julian Messner Illustrated Dictionary of Science*, says a law is a series of events in nature that always occur in the same way, under the same conditions. That definition doesn't come close to including any *generalizations*.

Ch. 1, p. 5

*Hypothesis: A testable statement about the natural world that can be*

A hypothesis, in common vernacular, is an educated guess or presumption.

Ch. 1, p. 5

*used to build more complex inferences and explanations.*

*Theory: In science, a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses.*

Well-substantiated is not necessarily truth. Well-substantiated still leaves room for doubt, or disproof.

Ch. 1, p. 5

The word "theory" to the common man means: an assumption or supposition.

*Scientists themselves use the word "theory" loosely and apply it to tentative explanations that lack well-established evidence.*

Sort of contradicts their previous statement.

Ch. 1, p. 5

*In science the word "hypothesis" conveys the tentativeness inherent in the common use of the word "theory."*

In English, the language of Americans, "hypothesis" means educated guess, conjecture, and unproven theory.

Ch. 1, p. 6

*Like "theory," the word "fact" has a different meaning in science than it does in common usage.*

It's amazing how language has been rewritten to meet science's own definition. If we can't depend on "common usage" of a word, then we can't depend on the science based on a "special meaning" of a word.

Ch. 1, p. 6

*A scientific fact is an observation that has been confirmed over and over.*

Science is based on absolutes, not definitions that mean whatever strikes the body of science at a given time. If in the '50s and '60s theory meant one thing, and in the '90s it means something else, one has to assume that a major part of the scientific community is still basing its premises on the meaning which was prevalent in the '50s and '60s.

*Laws in science are typically descriptions of how the physical world*

Evolution, on the other hand, will not be altered even when science gets new information and

Ch. 1, p. 6

*behaves under certain circumstances. Like all elements of science they can be altered with new information and observations.*

observations.

*Those who oppose the teaching of evolution often say that evolution should be taught as a "theory, not as a fact." This statement confuses the common use of these words and the scientific use.*

The common use as promulgated in Ch. 1, p. 6 this book is NOT common. If, as we are led to believe, the common use of the word "theory" is different, why then would the small percentage of people --- whose definition of theory differs from the common use -- be correct. Answer? They wouldn't .

*Theories do not turn into facts through the accumulation of evidence. Rather, theories are the end points of science.*

But didn't they just say...? Ch. 1, p. 6

*They [theories] are understandings that develop from extensive observation, experimentation, and creative reflection. They incorporate a large body of scientific facts, laws, tested hypotheses, and logical inferences. In this sense, evolution is one of the strongest and most useful scientific theories we have.*

Evolution is a theory - an unproven Ch. 1, p. 6 idea - but the majority of this document is espousing the idea that evolution is fact and should be taught as such. A theory is only a hypothesis not proven false over time.

*The **story** of evolution is one chapter in a scientific revolution that has occupied most of the past four centuries. The central feature of this revolution has been the abandonment of one notion about stability*

Evolution has not been part of the Ch. 1, p. 7 scientific revolution for the last four centuries.

Continue the sentence: "...one notion after another NOTION."

Also notice the words "story" and "NOTION" Neither OF these



*after another.*

words convey factuality.

**In the role-playing section following chapter one (where teachers are dialoguing with each other on how to get the evolutionary point across)...**

Did you know that Webster defines belief as acceptance?

Ch. 1, p. 10

*"Believing in evolution...that's not necessarily the right word. We accept evolution as the best scientific explanation for a lot of observations."*

*There's Archaeopteryx. It's a fossil that has feathers like a bird but the skeleton of a small dinosaur. It's one of those missing links that's not missing any more.*

Alan Feduccia, a world authority on birds at the University of North Carolina in Chapel Hill (an evolutionist), says: "Paleontologists have tried to turn *Archaeopteryx* into an earth-bound, feathered dinosaur. But it's not. It is a bird, a perching bird. And no amount of "paleobabble" is going to change that."

Ch. 1, p. 10

**Chapter two begins with a recount of various events in time. Stated as fact we read about events that occurred 3.8 billion years ago, 4.5 billion years ago; and hundreds of millions of years ago.**

How do they know this? No explanation is given on how they arrived at that figure.

Ch. 2., p. 1

*99% of the species that ever lived on Earth are now extinct.*

[extinct because] *all the members of the species died, the species evolved into a new species, or it split into two or more new species.*

Of course, this contradicts the definition they give for "species." (see endnotes)

Ch. 2, p. 1

There is not scientifically documented evidence that there is an intermediate life form necessary for one species to evolve into another species.

*Both men [Darwin and Wallace] observed that the individual members of a particular species are not identical but can differ in many ways.*

How enlightening! Look at brothers and sisters, and even twins.

Ch. 2, p. 2

*In the 1930s a group of biologists demonstrated how the results of genetics research could both buttress and extend evolutionary theory.*

Through natural selection. Eugenics was the name of that science and the experiments and research conducted was for the purpose of finding a super race. That research was conducted in Nazi Germany in the '30s.

Ch. 2, p. 3

*Evolution was thus seen to depend both on genetic mutations and on natural selection.*

Life getting better or degenerating?

Ch. 2, p. 3

*Evolution: Change in the hereditary characteristics of groups of organisms over the course of generations.*

This is not the same definition that is given through the rest of this book, i.e., change over time. I am changing over time, I am getting older, grayer, fatter, etc., therefore, I guess, I am evolving into something else. Reality is, that while I am changing over time, I am still a human, older, shorter than I was at age 21, heavier, bad teeth, etc. The more I change over time, doesn't mean that eventually

Ch. 2, p. 4

I'll be another species.

Actually, this is a definition of genetic variation (see below).

*Species: In general, a group of organisms that can potentially breed with each other to produce fertile offspring and cannot breed with the members of other such groups.*

In other words, humans can breed humans, and are a species. While donkeys and horses can breed offspring (mules), that offspring cannot breed another offspring, and there is no *new species*.

Ch. 2, p. 4

*Variation: Genetically determined differences in the characteristics of members of the same species.*

Eg., breeds of dogs, racial differences, in humans.

Ch. 2, p. 4

*Natural Selection: greater reproductive success among particular members of a species arising from genetically determined characteristics that confer an advantage in a particular environment.*

This is something we observe!

Ch. 2, p. 4

*Other situations also encourage the formation of new species.*

Actually, the examples are variations. The examples given (for the formation of new species) do not fit their own definition for species (see above), but do fit their definition for variation.

Ch. 2, p. 4

*In the 1950s, the study of evolution entered a new phase. Biologists began to be able to determine the exact molecular structure of the proteins in living things...The protein evidence was completely consistent with the **idea** of*

The protein evidence...

Ch. 2, p. 4

The structure of a protein is so complex that even given the supposed billions of years of evolution, a single protein could not develop without some help.

*a common evolutionary history for the planet's living things.*

*DNA is the ultimate source of both change and continuity in evolution.*

Proof?

Ch. 2, p. 5

*This uniformity in the genetic code is powerful evidence for the inter-relatedness of living things, suggesting that all organisms presently alive share a common ancestor that can be traced back to the origins of life on Earth.*

Does this mean we can trace our ancestry back to a tree? Or an ant? Or pond scum?

Ch. 2, p. 5

Or, can we trace our ancestry back to "an intelligent Designer who is Creator God?"

*Evolution does not design new organisms; rather, new organisms emerge from the inherent genetic variation that occurs in organisms.*

This has never been observed. So, then, how could a human being come from yeast? How could something come from nothing? It all had to begin somewhere. Before there was something, there was nothing.

Ch. 2, p. 5

*Evolution is the **only plausible scientific explanation** that accounts for the extensive array of observations summarized above.*

Ed. Note: Still isn't **plausible** to me. I cannot get past something just coming from nothing and GRADUALLY becoming all the forms of life we have today. I cannot fathom that happening without an "intelligent Designer."

Ch. 2, p. 6

*The creation of a new species from a pre-existing species generally requires thousands of years, so a human ... can witness only a tiny part of the speciation process.*

This sentence gives an excuse as to why there is no substantiation for Darwin's theory. Furthermore, what tiny part of the speciation process has been observed in the present and tested and retested for reliability?

Ch. 2, p. 8

*Science is a particular way of knowing about the world. Explanations are restricted to those that can be inferred from*

Think! Evolutionary theory is all based on what happened long ago BEFORE man. So who was there to **observe, experiment, substantiate, or measure?** This

Ch. 3, p. 1

***confirmable data*** - the results obtained through observations and experiments that can be substantiated by other scientists. Anything that can be observed or measured is amenable to scientific investigation.

***Explanations that cannot be based on empirical evidence are not a part of science.*** (emphasis added)

entire paragraph contradicts their major premise! One has to conclude therefore, that billions of years (their time frame) are NOT science.

*The best available evidence suggests that life on Earth began 3-1/2 billions years ago.*

Suggests - a whole bastion of scientific "fact" is based on a SUGGESTION?

Ch. 3, p. 1

*Heliocentrism...ran counter to the position of religious authorities ...based on a literal interpretation of the Bible, that the Earth was the center of the universe...*

Where in the Bible does it say that the Earth is the center of the universe?

Ch. 3, p. 3

*Like biological evolution, the theory of heliocentrism brought order and new understanding to an otherwise chaotic and confusing aspect of nature.*

What in nature is or was chaotic and confusing? Nature is very orderly. Look at snowflake patterns, leaf patterns, the cycle of life - I could go on and on.

Ch. 3, p. 3

*Statements of science should never be accepted as "final truth."*

But isn't that what is propounded in this treatise? Evolution is truth? Evolutionary theory is a statement of science. Therefore, according to their own reasoning, it should NEVER be accepted as "final truth."

Ch. 3, p. 4

*...biological evolution would have emerged as*

The Preface, p. 1, states that over 50% of people in America do NOT

Ch. 3, p. 4

*the accepted explanation for the history of life on Earth...*

accept evolutionary explanation for "origin" of man and want creation taught in the public schools.. So, by their own documentation, evolution is NOT an accepted explanation for the history of life.

*Science involves a great deal of careful **observation** that...produces an elaborate written description of the natural world.*

So, what of the process of evolution is **observable**? Evolutionists even admit that they cannot **observe** evolution because the process takes too long.

Ch. 3, p. 6

*By floating snails on salt-water for prolonged periods, Darwin convinced himself that, on rare occasions in the past, snails might in fact have "floated in chunks of drifted timber across moderately wide arms of the sea."*

It's easy to convince oneself of something one wants terribly to prove by inferences. Inference is not scientific proof.

Ch. 3, p. 12

*Public scrutiny is an essential part of science. It works to eliminate individual bias and subjectivity. It also leads to further observations or to experiments designed to test hypotheses...*

Yes, but unless the observations dovetail with evolutionists point of view, they discount it as "phony science." And, why is "group bias" better than individual bias?

Ch. 3, p. 12

*...skillful scientists like Darwin...*

Darwin was a failed theologian, not a scientist. The closest he comes to being a scientist is that he was an amateur naturalist.

Ch. 3, p. 12.

Darwin would never have been admitted to the National Academy of Sciences. He just didn't have the credentials!

*So much evidence has been found that supports the fundamental IDEA of*

That's a shame! The "evidence" consists of guesses. Guesses are not evidence. Yet the occurrence of

Ch. 3, p. 13

*biological evolution that its occurrence is no longer questioned in science.*

evolution is questioned in the scientific community.

*In copying its DNA nucleotides...cells inevitably make a small number of mistakes.*

So over billions of years, would there be lots of mistakes? It follows, then, that everything that has supposedly evolved over billions of years is the result of a mistake.

Ch. 3, p. 13

Think about what students are taught. First they are taught that their ancestors were animals. Then they are taught that over billions of years of evolution they and all other humans are the result of a mistake. That really a self-esteem building theory, isn't it?

*The evidence [that each organism should contain detailed molecular evidence of its relative place in the hierarchy of living thing] can be found in the DNA sequences of living organisms.*

Still doesn't prove ancestry or the development of one species into another species by evolution.

Ch. 3, p. 13

*The lineage that led to humans and to chimpanzees diverged about 5 million years ago - whereas one needs to look back in time to about 80 million years to find the last common ancestor shared by mice and humans.*

How do they KNOW this? Were they there?

Ch. 3, p. 14

*Still further in the past, we and yeast shared a common ancestor - and the molecular data reflect this pattern.*

This would explain why so many people love their beer!

Ch. 3, p. 15

And therefore...humans from chimps from rattlesnakes from mice from brewer's yeast

*One goal of science is to understand nature. "Understanding" in science means relating one natural phenomenon to another and recognizing the causes and effect of phenomena.*

When Mt. St. Helens erupted in the early '80s, it was discovered that the mudflow that followed the eruption caused a canyon, not unlike the Grand Canyon. Geologists even call it "Little Grand Canyon." This is an amazing phenomenon, because it has been alleged for years that the Grand Canyon could only have "evolved" over billions of years. Flood geologists, however, have averred that the Grand Canyon was the result of a cataclysmic flood (such as that which is recorded in Genesis - called Noah's flood).

Ch. 3, p. 16

*The statements of science are those that emerge from the application of human intelligence to data obtained from **observation and experiment.***

Evolutionists cannot prove their theory of origins because there has been no **observation and experiment.** Belief in evolution is akin to belief in an "intelligent Designer."

Ch. 3, p. 17

*One of the most characteristic features of science is this openness to challenge. The willingness to abandon a currently accepted belief when a better one is proposed is an important demarcation between science and religious dogma.*

Balderdash! Scientists are not at all prone to giving up past beliefs. Look at Haeckel's "fetuses" which have been proven false, but still show up in many biology texts.

Ch. 3, p. 19

*These documents [state models, national models] agree that ALL students should leave biology class with an understanding of the basic concepts of biological evolution.*

A look at many of the state models does not address understanding evolution as an outcome at all. This document lists one book (*Benchmarks for Science Literacy*) as proof. One book is NOT all.

Ch. 4, p. 1



From the science standards: *Evolution is a series of changes, some gradual and some sporadic, that accounts for the present form and function of objects, organisms, and natural and designed systems.*

What are designed systems? Systems designed by man or by an intelligent Creator? Furthermore, even creationists agree that the true definition of evolution is "change." However, throughout this document, evolution is not referring to change, but to the theory espoused by Darwin, and the "proofs" of that theory.

Ch. 4, p. 3

The evolutionary theory referred to in this book and the Science Standards is the theory that explains the descent with modification of organisms from common ancestors.

*Standards rest on the premise that science is an active process.*

In most models (states) students "do" science rather than "learn" science. Students watch waves roll onto a beach, or wave action in a bottle, rather than learn what causes wave actions.

Ch. 4, p. 2

*The intention of the K-4 standards is to develop the knowledge base that will be needed when the fundamental concepts of evolution are introduced in the middle and high school years.*

If that was the intention, then why didn't the developers say that? I sat on Ohio's curriculum development committee for two years. It was the INTENT of that committee NOT to push evolution, or creation, or origins. There is a lot more to learn in science than the theory of evolution, yet textbooks spend a proportionately greater amount of space on this topic than others.

Ch. 4, p. 4

There are several discussions in this chapter which push "evolution." However, in context "evolution" is change, not common ancestry. Many states have NOT included biological evolution (that term at least) in their frameworks or models. However, if the U.S. starts requiring (voluntarily of course) a national science exam,

Ch. 4, p. 3-6

then knowledge of the coursework in this guide WILL be included and required. And see page 31 to find out what the intent is if these students don't answer "correctly" according to the National Academy of Sciences and the National Science Standards.

There are also sections where the book addresses co-evolution. This is not Darwinism, nor the evolution that is discussed in Chap. 1 and 2 of the Guidebook.

*Many individuals have contributed to the traditions of science. Studying some of these individuals provides further understanding of scientific inquiry.*

The only two individuals studied in Ch. 4, p. 7 this Guidebook are Darwin and Wallace, not exactly a great sampling of the scientists down through the ages. If a student were to study Galileo, Kepler, Pasteur and these "other scientists," the fact of their belief in a Creator God would be exposed.

Listed as an outcome from the national standards: *biological evolution*

That particular terminology is not in very many state standards. Ch. 4, p. 7

On page 9 there is a rather long description of the origin and evolution of the earth system. It is averred that the solar system formed as the result of a "big bang" (even many scientists don't believe that any more). All life began as one cell (bacteria) more than 3.5 billion years ago. All this is stated as "fact" even though throughout the text we are cautioned to not believe "facts" because "facts" change.

On the other hand, the origin and evolution of the universe is stated as theory, not fact.

It therefore must be assumed that biological evolution is "fact" and universe evolution is still "theory."

Beginning on p. 8, there are specific instructions on how to get a student to come around to the evolutionary way of thinking (belief). This is a great example of how the Delphi Technique works.

Ch. 4, p. 9, 10

*Scientific explanations must be...consistent with experimental and observational evidence...logical...respect the rules of evidence...open to criticism, report methods and procedures, and make knowledge public.*

How many evolutionists do you know who are open to criticism? How many evolutionists do you know that have any "observational evidence" to substantiate their claim? This entire treatise is in response to criticism of evolution.

Ch. 4, p. 10

*Explanations on how the natural world changes based on myths, personal beliefs, religious values, mystical inspiration, superstition, or authority, may be personally useful and socially relevant, but they are not scientific.*

Are evolutionists not expressing their personal beliefs? Whether they want to admit it or not, their "theory" is still a theory. No one was there to verify that what they are guessing occurred actually occurred. So, what is good for the goose must be good for the gander. They need to be put to the same strenuous test to which they put any one (scientists or common man) who disagrees with them.

Ch 4., p. 10

But didn't the writers admit earlier that Darwin had a personal belief concerning snails?

The notion that a fetus isn't a child is personally useful and socially relevant, but it is not scientific.

**Chapter 5 compares evolution and creation science. Here's the rub. Back in the Preface, the authors said they would not blast any religious belief. I guess they couldn't resist.**

*The basic proposals of creation science are not subject to test and verification.*

Nor are Darwin's ideas! Not one scientist has been able to show or demonstrate that a man came from an ape. The bones found which purport to advance this theory are usually only partial skeletons, and many have been shown to be hoaxes.

Ch. 5, p. 2

*Things in science can be studied even if they cannot be directly observed or experimented on. Archaeologists study past cultures...Geologists can describe past changes in sea level... Paleontologists study fossilized remains of organisms that lived long ago.*

This is true. However, the definition of *real science* is that which can be observed in the present and can be repeated in the present. Evolution on the other hand is an assumption based on the unobservable and unrepeatable past.

Ch. 5, p. 2

*Something that happened in the past is thus not "off limits" for scientific study.*

Creationists would not disagree with that statement. However, study is not science.

Ch. 5, p. 2

*No one saw the evolution of one-toed horses from three-toed horses, but that does not mean that we cannot be confident that*

On what basis can we be confident that this happened? On our *bias* or *belief*. We now are in the realm of religion, aren't we? Is going from three toes to one toe evolution or

Ch. 5, p. 2

*horses evolved.*

devolution (loss of information).  
Furthermore, the National Museum  
of Nature History has abandoned  
the so-called "horse series."

*The theory of evolution  
explains how life on earth  
has changed.*

This is ONE explanation.

Ch. 5, p. 3

*Theory does not mean  
"guess" or "hunch" as it  
does in everyday usage.*

Theory means: supposition  
explaining something, especially  
one based on principles  
independent of the phenomena to  
be explained. A set of statements  
designed to explain a phenomenon  
or class of phenomena.

Ch. 5, p. 3

However, since evolution can not  
be shown to happen (in the  
present), it **MUST** remain a theory,  
and cannot become fact (as this  
document wants the reader to  
believe).

*Scientists most often use  
the word "fact" to  
describe an observation.*

Sort of convoluted reasoning. Once  
again, redefining the term.

Ch. 5, p. 3

*But scientists can also use  
fact to mean something  
that has been tested or  
observed. The occurrence  
of evolution in this sense  
is a fact.*

But scientists have NOT observed  
or tested evolution. They can't.  
Because they admit that it takes  
billions of years for evolution to  
occur and no one in their right  
mind believes that any scientist  
living today was around billions of  
years ago and has been able to  
observe or test evolution!

There is also no "mechanism" of  
evolution that has been proposed  
for testing or observation other  
than genetic variation, with  
mutation, which is not upward  
evolution (something from  
nothing).

*Scientific consensus around evolution is overwhelming.*

Consensus is NOT necessarily majority thought nor does consensus mean something is true. Consensus means there is agreement. There is also **consensus** in the scientific community around the belief that God created all life. Consensus is NOT proof that a theory is true.

Ch. 5, p. 3

We now know that the concept of viability of a fetus as espoused in Roe v. Wade is off the mark. Take for instance, the octuplets that were born in Texas in late 1998. One of those babies weighed less than one pound and as of this writing is still alive. According to Roe v. Wade those babies would not be viable, and therefore aborting them would not be a problem. Consensus is not a reason to say something is true or valid.

*Theories are a goal of science.*

Is evolution a goal or a fact?

Ch. 5, p. 3

*Scientists are disputing how evolution occurs, not whether evolution occurred.*

Actually, scientists are disputing both. Not all scientists believe biological evolution is true or reasonable or could have occurred.

Ch. 5, p. 3

*Dinosaurs were extinct long before humans walked the Earth. We know this because no human remains have ever been found in rocks dated to the dinosaur era.*

Which proves what? This claim is made because human fossils are not found near dinosaur fossils. Well, human fossils are not found near other animal fossils either. Evolutionists claim that dinosaur bones are millions of years old. However, when a bone is dug up, there is no label attached to it saying, "This bone is 10 million years old." Furthermore, many bones are dated by methods that some scientists show cannot be trusted.

Ch. 5, p. 4

<i>Humans did not evolve from modern apes, but humans and modern apes share a common ancestor, a species that no longer exists.</i>	<p>The species has never been produced.</p> <p>It takes a lot more faith to believe that statement (a belief for which there is no evidence) than it does to believe that a Creator God made everything out of nothing.</p>	Ch. 5, p. 5
<i>Evolution is a branching or splitting process in which populations split off from one another, and gradually become different.</i>	<p>Another definition of evolution, and a speculation with no evidence - no transitional forms.</p>	Ch. 5, p. 5
<i>Belief is not an appropriate term to use in science.</i>	<p>All hypotheses start as beliefs. Using the scientific method validates those beliefs.</p> <p>Darwin himself used that very term several times. Furthermore, all scientists have a belief and then they take that that belief and try to prove that it is a scientific "fact."</p>	Ch. 5, p. 6
<i>Science is a way of knowing about the natural world.</i>	<p>So is religion.</p>	Ch. 5, p. 6
<i>The courts have held that it is unconstitutional to present creation science as legitimate scholarship.</i>	<p>A unique choice of words. The courts have held that the teaching of creation is allowed. And the ruling actually says that it is illegal to <b>require</b> the teaching of creation science. <i>Require</i> and <i>permit</i> are two different terms. Unfortunately the school districts rely on the news media to know what they are permitted and not permitted to do, and when threatened with a lawsuit succumb to the threat rather than search out what their options are.</p>	Ch. 5, p. 6
<i>The U.S. Constitution states that schools must be religiously neutral, so legally a teacher could</i>	<p>Blatant misinformation!</p> <p>Please tell me where in the U.S. Constitution one finds the words</p>	Ch. 5, p. 7

*not present any particular creationist view as being more "true" than others.*

"schools must be religiously neutral." Most state constitutions require that religion be part of education.

*It [evolution] offers a way to understand the astonishing complexity, diversity, and activity of the modern world.*

So does creation (religion) and studies of intelligent design.

Ch. 5, p. 7

*If a child does not understand the basic ideas of evolution, a grade **could** and **should** reflect that lack of understanding, because it is quite possible to comprehend things that are not believed.*

(emphasis added)

In other words, lower the grade of a child that has a belief that Creator God made all things. I have documentation that this event, in fact, has occurred, over and over throughout this country. Unless and until a child admits that evolution is the only way the origin of life occurred, s/he fails. After all, evolution is true science (observable and repeatable in the present). (Discussed on page 25.)

Ch. 5, p. 8

*Any science topic can be taught in an inquiry-oriented manner, and evolution is particularly amenable to this approach.*

So is intelligent design. Even when presented without any religious connotations, teachers have been threatened with job loss for presenting origins in this manner.

Ch. 5, p. 8

### **Chapter 6 contains activities for teaching about evolution.**

*Critical aspects of science include curiosity and the freedom to pursue that curiosity. Other attitudes and habits of mind that characterize scientific inquiry and the activities of scientists include intelligence, honesty,*

Unless you happen to believe in Creator God. And, isn't asking about alternatives to evolution a "healthy skepticism?" Wouldn't learning the perspective of creationists help evolutionists be "open to new knowledge?"

Ch. 6, p. 2,  
Activity 1



*skepticism, tolerance for ambiguity, openness to new knowledge, and the willingness to share knowledge publicly.*

*Scientific inquiry includes systematic approaches to observing, collecting information, identifying significant variables, formulating and testing hypotheses, and taking precise, accurate, and reliable measurements.*

*For students to develop an understanding of evolution and the nature of science requires many years of educational experiences.*

Think about that statement and relate it to what you know about how evolution is "proven" to be a "fact." There can be no observation, because by admission evolution takes longer than a human lifetime to observe. Information can be collected which does identify significant variables, however, testing the hypothesis cannot happen. Also, precise, accurate and reliable measurements cannot be taken because admittedly the process takes too long. What happens is: guesswork on "scientists" part. Evolution does not lend itself to "scientific inquiry."

That folks, is called brainwashing.

The activities given in this chapter (there are 8 of them) are all designed to break down any Christian thinking a child might have. To make fun of religious beliefs, and to insure that all children believe in evolution.

### **Chapter 7 discusses how to select a textbook.**

*The following are excerpts from important*

Error! Excerpts are direct quotes (by definition). What are presented

Ch. 6, p. 2,  
Activity 1.

Ch. 6, p. 4

Chapter 6

Appendix  
A

*court decisions regarding evolution and creationism issues.* are the authors' synopses of the various court cases.

*Statements about creation...should not be regarded as reasonable alternatives to scientific explanations for the origin and evolution of life.*

In other words, a believer in creation is unreasonable and irrational. Is this a "religiously neutral" statement?

Appendix  
C

## CONCLUSIONS

Facts must be interpreted according to a framework. Evolutionists are **biased** towards naturalism. Creationists admit they are **biased** toward the Biblical account of creation. Both groups have the same facts.

Both the Biblical creation framework and the one-cell to people frameworks teach that organisms change through time, and that mutations and natural selection play a large part in this process. However evolutionists *assume* that these changes increase the information content. There is nothing in the scientific record that shows this phenomenon. Creationists, on the other hand, believe that God created separate *kinds*, and that changes either remove information or leave the total information unchanged. The examples presented in the NAS book do not demonstrate an increase in information, which would be required according to the evolutionary theory.

Evolutionists have predicted (ever since Darwin) that the fossil record would produce intermediate forms linking one kind of organism to another kind. The fossil record, however, shows that organisms (animals, plants) appear fully formed, with only a handful of *debatable* examples of transitional forms have been found.

Humans are very different from apes (monkeys, chimps, orangutans), especially in intelligence and language. DNA similarities between humans and apes are exaggerated; the dissimilarities correspond to differences in information. Further, *proper* drawings of embryos show that different **kinds** have very different embryos, not ones that are similar.

*Teaching about Evolution* ... presents the "big bang" theory as **the way** that the universe came to be. However, there is no explanation to tell how the universe could come into existence without a cause, or for the formation of stars and solar systems after such a catastrophic event.

While the NAS states that the purpose their document is not to "specifically refute the ideas proffered by those who oppose the teaching of evolution in public schools," -- and

even states that "religious faith and scientific knowledge, which are both useful and important, are different" -- throughout the document, notwithstanding, examples are given (erroneously) to prove that religious beliefs are scientifically inaccurate.

*Teaching about Evolution...* states that the earth is billions of years old. It uses the fossil record and radiometric dating as "proof." There are, however, indications that catastrophic processes forged many "old" rocks and fossils. This is compatible with the Biblical account of a worldwide flood. Radiometric dating, on the other hand, depends on several *untestable* assumptions about the past, and its methods have often been shown to be inaccurate.

Pure and simple, *Teaching about Evolution...* is a politically motivated document. The "politically correct" notion of evolution is espoused as "fact," and the politically incorrect idea of religion becomes passe and old fashioned.

**DEFINITIONS** (as stated in the text, not necessarily what is commonly understood as the definition).

**Fact:** In science, an observation that has been repeatedly confirmed. NOTE: Facts are always interpreted according to a framework. For example: A scientist looks at the Grand Canyon and sees a big hole in the ground made by a catastrophic event . A non-scientist looks at the Grand Canyon and sees a big hole in the ground. Both are facts, both are observed, only one has been repeatedly confirmed (a big hole in the ground).

**Law:** A descriptive generalization about how some aspect of the natural world behaves under stated circumstances.

**Hypothesis:** A testable statement about the natural world that can be used to build more complex inferences and explanations.

**Theory:** In science, a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypothesis.

**Evolution - Def. #1:** Change in the hereditary characteristics of groups of organisms over the course of generations.

**Evolution - Def. #2:** explains that what we see today is different from what existed in the past. Also concerns changes in living things during the history of life on Earth. (Ch. 5, p. 1)

**Evolution - Def. #3:** non-living chemical cells organized themselves into a self-reproducing organism from which all types of life are alleged to have descended. This offspring occurred by natural, ongoing processes from this simple organism. **NOTE: No examples are given in the text of finding a way to generate enormous amounts of information needed to go from the single-cell organism to the billions-of-cells human. In fact, all examples given in *Teaching evolution...* denote losses of information.**

**Species:** A group of organisms that can potentially breed with each other to produce fertile offspring, and cannot breed with the members of other such groups.

**Variation:** Genetically determined differences in the characteristics of members of the same species.

**Natural selection:** Greater reproductive success among particular members of a species arising from genetically determined characteristics that confer an advantage in a particular environment.

**Engage:** This phase of the instructional model initiates the learning task.

**Explore:** This phase of the teaching model provides students with a common base of experiences within which they identify and develop current concepts, processes, and skills.

**Explain:** This phase of the instructional model focuses students' attention on a particular aspect of their engagement and exploration experiences and provides opportunities for them to develop explanations and hypotheses.

**Elaborate** - This phase of the teaching model challenges and extends students' conceptual understanding and allows further opportunity for students to test hypotheses and practice desired skills and behaviors.

**Evaluate** - This phase of the teaching model encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate student progress toward achieving the educational objectives.

**Biological evolution** - species evolve over time. Evolution is the consequence of the interactions of (1) the potential for a species to increase its numbers; (2) the genetic variability of offspring due to mutation and recombination of genes; (3) a finite supply of the resources required for life; and (4) the ensuing election by the environment of those offspring better able to survive and leave offspring.

Natural selection and its evolutionary consequences provide a scientific explanation for the fossil record of ancient life forms, as well as for the striking molecular similarities observed among the diverse species of living organisms.

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*Science* and *Nature* magazines, also have many articles which present the origin of the universe from an evolutionary perspective. Both magazines are available on line (for a fee), and they both have searchable indexes that go back several years.

THE FOREGOING LIST IS NOT A COMPLETE LIST OF WRITINGS AVAILABLE.

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## ENDNOTES

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<sup>2</sup> Larson, Edward J. and Witham, Larry, "Leading scientists still reject God," *Nature*, **394**, 23 July 1998, pp. 313.

<sup>3</sup> Press release from the National Academy of Science announcing that they were about to release a book to the public schools.

<sup>4</sup> National Science Education Standards (downloaded from the World Wide Web, 4/14/98). <http://www.nap.edu/readingroom/books/nses/ntml/contents.html>

<sup>5</sup> Percival Davis and Dean Kenyon, *Of Pandas and Peoples*, Dallas: Haughton Publishing.

<sup>6</sup> It occurs to me that a question that is never answered is: how did man (or any animal for that matter) reproduce itself without the two sexes. In other words, if man evolved once, where did the second man come from? When does woman enter the picture? When does sexual reproduction begin?

<sup>7</sup> G. G. Simpson, "The world into which Darwin led us," *Science* 131: 966-969.

<sup>8</sup> This writer does not recall being taught evolution as fact in her elementary, secondary, or college years in any science course. However, in digging out her college texts, it is obvious that the material was in the books for her to read. I was a mathematics major with a minor in biological sciences. My only recollection of the subject being covered was that it was a theory, and therefore, not a proven fact. If one looks in today's textbooks, however, the *theory of evolution* is presented as the FACT of evolution.

<sup>9</sup> M.K. Richardson *et al* ref. 16, Springer-Verlag GmbH & Co. Tiergartenstrasse, 69121, Heidelberg, Germany., *Anatomy and Embryology*, 196(2):91-106., 1997.

<sup>10</sup> E. Pennisi, "Haeckel's Embryos: Fraud Rediscovered," *Science* 277(5331):1435, Sept. 5, 1997.

<sup>11</sup> Stone, Jean. *The Julian Messner Illustrated Dictionary of Science*, 1985, BLA Publishing, LTD., p. 86 (available from amazon.com)

<sup>12</sup> "Archaeopteryx: Early Bird Catches a Can of Worms," *Science* 259 (6096): 764-65, Feb. 5, 1993.

<sup>13</sup> For a great description of the Delphi Technique, go to <http://www.fessler.com/delphi>

<sup>14</sup> Concise Oxford Dictionary of Current English, ed. H.W. Fowler, 4<sup>th</sup> Ed. Clarendon Press, 1964.

<sup>15</sup> The American Heritage Dictionary, 2<sup>nd</sup> college ed. Houghton-Mifflin, 1983.

<sup>16</sup> Taylor, Ian T. *In the Minds of Men*. TFE Publishers, Toronto, 1984, p. 295-304.

See also, Ham, Ken. *The Great Dinosaur Mystery Solved*, 1998, Master Books, p. 15-28.

<sup>17</sup> See Charles Darwin, *Origin of Species*, 6<sup>th</sup> ed., 1872, reprinted 1902, John Murray, London.

<sup>18</sup> Teachers can get copies of pamphlets which enunciate their rights regarding religious teaching. Three excellent sources of information are (1) *Rights of Religious Persons in Public Education* by John Whitehead; (2) *The truth about religious education law and students rights under the first amendment*, U.S. Center for Law and Justice; (3) *Religion and Public School Curriculum* (a booklet endorsed by the N.E.A. All these booklets can be obtained from Christian Education Association International (CEAI) by e-mailing CEAIeduca@aol.com.