On The Learning Of Evolution

Deservingly or not, the theory of evolution is a controversial subject, and I would like to share my position on the subject with you. Like all other scientific theories, the theory of evolution is a well-substantiated explanation of a set of observations. Throughout the series of trips, you will learn what those observations are and why they are evidence to support the theory. As well-substantiated as the theory of evolution is, there is a possibility that it may be replaced by another theory as new evidence comes to light, and/or when the existing evidence is explained by a more convincing theory. That is how science works.

To call the entire theory of evolution a "fact" is misleading in the *popular* conception of the word. The popular definition of fact is something that is indisputable and unchanging. This is an "ultimate truth." Nothing in science fits this definition! (Gravity has held up pretty well, but even gravity cannot be proven as an ultimate truth). The difference between science and other ways of knowing things is that "truths" in science are provisional - they can be modified or discarded. That does not mean the benefits of science should be thrown out the window. Truths (theories) in science are not changed or discarded simply because there are gaps or flaws in the theory. The way theories change is by a *better* explanation of existing evidence. By *better,* I mean a logical explanation with fewer gaps and flaws, not one that simply points out the flaws in the existing theory.

There are parts of the theory of evolution that can be considered fact. We see organisms change over time - that is a fact, because we have observed it happen. Populations of bacteria become resistant to antibiotics, moth populations change from mottled to dark when pollution changes tree color from mottled to dark, insect populations can become resistant to pesticides, etc. These examples are changes over time, which is the definition of evolution.

It is not my place to tell you what to believe. Science is not a belief system in that sense. If there is any belief attached to the process of science, it is the belief that we can learn about the universe by making observations of it with our senses. There may be other ways to make observations, but only those made with our five senses can be objectively agreed upon by others. Statements that a higher being has revealed something to a person may be true, but others cannot testify to that like they can with their senses.

The purpose here is to get you to *understand* the Theory of Evolution.

Just because something is difficult to understand does not make it false. The Theory of Evolution *is* somewhat difficult to understand because it is supported by evidence from many different fields.

- To understand fossil evidence, you must know how rocks, thus fossils, are formed.
- To understand structural similarity evidence, you must know the anatomy of many different currently living organisms.
- To understand isotopic dating evidence, you must know basic chemistry first, then you must know the chemistry of radioactive decay.
- To understand other evidence for the age of the universe, you must know a significant amount of math, physics, and astronomy.
- To understand genetic evidence, you must understand statistics in addition to the basic biology of nucleic acids and the chemistry of cells.
- To understand developmental evidence, you must know developmental biology.

In this series of trips, we will not have time to get into all the details of geology, chemistry, astronomy, or math, and we will not even be able to address some aspects of biology. Those that expect a "soundbite" answer to the question "How does evolution work?" will be disappointed. But disappointment and/or incomplete understanding is not a reason to discard the theory. I'll end with an analogy (<u>not</u> a comparison) that may make the goal of the topic easier for some:

People take classes such as Spanish and French, they learn about many different cultures in Social Studies classes, and are, in general, subjected to ways of life that are different from their own. A student can learn, for example, about the Chinese culture without becoming a communist or a Buddhist, and they don't have to give up speaking English for Mandarin. All I am asking is that you do the equivalent of *learning about* the Chinese, I am not asking that you do the equivalent of *becoming* Chinese.

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Experiencing Life