

A thought experiment for you. Imagine catching a snowflake. Take a close look at it, undoubtedly some beautiful, incredibly intricate crystalline lattice. Elaborate detail...unique. Give some thought as to what forces shaped it. Now, explain how each of those molecules of water have aligned themselves in the particular place and orientation to form that snowflake. Exactly how did the atmospheric pressure, temperature, humidity and other factors working at the molecular level combine to make that snowflake exactly as you see it? You can't explain how that unique snowflake came to be? Do you then jump to the conclusion that there are little invisible people standing on the clouds designing the snowflakes and sprinkling them around the landscape? If you do, you might be able to make a fascinating story out of it, but agree with me here...you have not stumbled upon a reasonable scientific hypothesis. When you look at snowflakes in detail they may appear designed and you most certainly can't explain exactly how they came to form the unique structure you see, but you understand that they are simply a wonderful artifact of a complex environment. Proponents of Intelligent Design (ID) would have you learning in science class about little invisible people standing on clouds.

Court cases are popping up across the US regarding the teaching of ID in high schools. Legislation is being introduced on both sides of the issue and the concept of rational thought is being challenged by a movement that would have you believe that the diversity of life on Earth did not come about through natural evolution, but rather was designed by some intelligent...thing (they usually stop short of calling it God). What's worse, they try to pass it off as science.

Some consider ID an alternative explanation to evolution, others call it 'creationism in a cheap suit.' The basic arguments for ID are founded on four points, which have become the litany of ID proponents, including Michael Behe, a molecular biologist at Lehigh University:

a) **We recognize design.** No one could argue that the faces portrayed on Mt. Rushmore are an artifact of natural processes like tectonics and erosion, as opposed to the form of most other mountain ranges (ie. Blue Mountain, one of the continuous ridges that make up the Appalachians). Mt. Rushmore was designed...obviously.

b) **Everyone agrees that aspects of biology appear to be designed.** Great scientists have been quoted as saying that we must *continually* remind ourselves that biological systems are not designed. Behe claims that they are ignoring the obvious.

c) **There are structural obstacles in evolution.** Behe agrees that evolution happens, but could not result in the complex systems that we see at the molecular level. Just as a mousetrap does not function if you remove any of its parts, complex biological structures, made up of 30 or more components, do not function if you take one piece off. Behe claims that these systems are therefore 'irreducibly complex,' and could not have evolved through processes described in neo-Darwinian evolution. Time and energy constraints prevent the cell from evolutionarily producing 29 non-functioning parts before it builds the final 30<sup>th</sup> one that makes a given enzyme able to do its job.

d) Lastly, **the bold claims of evolutionary theory are not well supported.**

At first, this all may sound reasonable, or at least benign, but there are a lot of problems with this line of 'thinking.' First and foremost, ID is vacuous in terms of science because it is not falsifiable. By definition, any scientific hypothesis must be *able* to be disproven. This is imperative to how science functions. When enough rigorous experiments have attempted (and all failed) to disprove an idea, the idea becomes a 'theory.' A theory isn't an unchangeable rule, but it does represent our *best* understanding of a reproducible phenomenon. A theory is not a fact, it *explains* facts. That is as good as it gets in science. You can't test ID. There is no experiment you can do that would say, 'no, this was definitely not designed by some intelligent being.' It is therefore worthless as a scientific hypothesis.

We recognize design. This much is often true, but it isn't as simple as ID proponents try to make it. Consider two mountain ranges. Mt. Rushmore is obviously designed, Blue Mountain does not appear designed. That didn't stop the Lenni Lenape Native Americans from creating legends about how Blue Mountain came to be. They propagated several legends about the construction of the Appalachians, one of which involved a tortoise that "had a power and a nature to produce all things, such as earth, trees and the like." We know better. The science of geology developed to help us understand how Blue Mountain, and all the ridges and valleys of Appalachia came to be. The legends are wonderfully rich stories, but bare no resemblance to reality. I would propose that ID is a similar type of legend. It reeks of the mentality 'We'll *never* understand it so let's just make something up...now let's all go eat some ice cream!' That is not science. That is an insult to human intellect. The travesty of it all is that proponents of ID can't even think up an amusing story as to how this all takes place, rendering the assertion void of even poetic significance.

Many great scientists, Richard Dawkins, Francis Crick, and the like, have been quoted as saying that scientists must continually remind themselves that biological systems are not designed. Behe claims that they are actively deluding themselves...afraid to accept the obvious. But science isn't about what appears to be obvious. Many of earth's systems, especially biological ones, are wonderfully complex. The reason we need to remind ourselves that they are not designed is because that is our knee-jerk reaction...that is what we do, we design things, that becomes a default explanation for processes we don't fully understand. Furthermore, it is difficult for us to comprehend the wide range of time and spatial scales over which biological systems work. At this point we have only a rudimentary idea of how this all works. We have no idea, even in the most general and schematic way, how the ~30,000 genes in the human genome all combine to result in our consciousness, our ability to articulate sentences, which are more or less true and which can be interpreted by and responded to by other beings. NO! We don't have that all figured out yet, but we can't afford to throw our hands up and just go eat ice cream! We have problems to solve. We have wonderfully complex things to figure out. From the standpoint of survival, it is our only chance. 99.9% of all species that ever lived on earth are extinct. Many have fallen to changing climatic conditions and loss of habitat over the past 600 million years. We have rapidly evolving viruses and parasites to understand and combat. We need science to understand how these things work. And what does it mean to be human? What fascinating phenomena will our conscious minds allow us to explore, to understand, to appreciate?

The only way to find out is to continue to ask questions that can be answered. Keep thinking. A mind is a terrible thing to waste.

Dr. Behe has made some valuable contributions to biology by pointing out several obstacles in evolution. His research has indicated numerous gaps in our understanding of how complex molecular structures are built over evolutionary time. Much more research is needed to understand how evolution can account for these seeming anomalies. An analogous situation arose when geologists were hard-pressed to explain why the summit of Mt. Everest, standing 30,000 feet above sea level, is underlain by limestone, a rock that is only formed in shallow oceans. Geologists figured it out...demonstrable facts as spectacular as any legend you could imagine. Biologists will figure out the gaps still eluding us in evolutionary theory.

Is evolution well supported? Evolution functions by two fundamental processes, a continual process of random changes of the genetic code and non-random environmental selection, which will either favor or disfavor the change that results from the mutation in the genetic code. Minor changes, selected for or against by the environment over inconceivably long periods of time. And what is our evidence? One of our main sources of evidence is fossils. Darwin was bothered by the lack of fossil evidence for transition species between reptiles and mammals. As it turns out, the events that lead to making fossils are somewhat infrequent; so many types of organisms never find themselves in a position to become immortalized as a rock cast. But, many fossils have been discovered since Darwin's time, one in particular that links reptiles and mammals. Transitional species are uncovered all the time. Because we keep looking for them. Because we aren't content to say 'well there are no transitional species to account for the evolution of this species from its predecessor, so it must have been designed.' We do science. We answer questions.

My last question for you to ponder comes at a critical time as heated discussions are taking place around the country with significant social and political implications regarding whether or not ID should be taught in high school science classes. It is clearly not science. It clearly does not help develop critical thinking skills. My question is this: what happens to the ID movement when Dr. Behe, a respected scientist, intelligent person and foremost proponent of ID, comes out and admits that ID is not falsifiable and is therefore not science. Teach it as a philosophy. Teach it as a religion, but it is clearly not science. It would be a victorious day for mankind, human intellect and America. I, for one, certainly hope he is considering it. A mind is a terrible thing to waste.