

## One Scientist's Perspective on "Intelligent Design"

I am going to begin my comments on Intelligent Design with some assumptions held by scientists (at least the vast majority of them) and a definition of "theory". Scientists share a view with many of the ancient Greeks, including Aristotle, that philosophers call "realism" or more specifically, "rational realism". As part of that view, scientists assume that there are fundamental rules that nature follows. There is only one real way that nature is and that nature operates. Scientists assume that it is possible for human reason to figure out that one real way so they endeavor to find a correct understanding of that one real way. "In other words, most scientists assume that beliefs about what is real do not affect what is real. Truth results only when our beliefs about what is real correspond to what is real" (Pine, ch 2).

However, historians and philosophers of science have shown us that science is a very human endeavor and that many aspects of our humanity also play a role in scientific discovery: our culture, artistic creation and imagination, political manipulation and personal exploitation, wishful thinking, bias, egocentricity, etc. It is possible to arrive at various interpretations of the same data or facts and to develop various explanations of the underlying causes at work. Our culture, egos, and personal beliefs provide a filter through which we interpret the data and develop explanations. Because scientists have a "realism" perspective and because culture and egos can affect the interpretations of the data, scientists are willing to have their ideas and explanations closely examined and tested by others, particularly by their peers, in a process called "peer review". "[Science] values testability and critical evaluation, because thus far it appears that the more we think critically about our beliefs, the more likely we are to know the truth" (Pine, ch 2). Peer review works best if the ones who critically analyze an explanation have an alternate explanation and try to poke holes in the other person's explanation. (Sometimes that "poking" is pretty brutal!) This peer review happens at science conferences and in the pages of science journals. A scientist will not try to have his/her opinion advanced by political means or legislated by politicians.

Scientists believe that the best way to know about nature is through objective observational experience. In fact, these objective observational experiences are *necessary*—the key method for attaining truth. This is a position the philosophers call "empiricism". Beliefs must be validated by experiences that are public. Anyone looking through a telescope at an object should see the same thing. Scientific truths must be communicable or describable in a public language. Any scientific claim must be testable by public observational experience.

The rationalists will say that the result of public observational experiences can be wrong but there are some things we know to be true with self-evident certainty.  $2+2=4$ , there are no spherical cubes, etc. Certainty is only possible through the use of logic and reason. During the Renaissance period in the 17<sup>th</sup> century, empiricism and rationalism were combined to make the modern scientific method of figuring out how the world, the universe, works. The deductive logic of rationalism was combined with inductive logic based on the observational experience of the empiricist. Although no scientific belief or claim can ever said to be absolutely certain, we can consider some to be reliable because they are so well supported by the evidence. We have observed that, so far, all heavy objects dropped from tall places fall to the ground and scientists have concluded that gravity applies everywhere on Earth. From the observations of hundreds of

objects (moons around planets, planets around the Sun, stars around each other in binary and multiple systems) we have concluded that gravity applies everywhere in the universe. Since we're talking about evolution today, I should include in here that Darwin's theory of natural selection is a reliable belief because it is one of the most factually supported and independently corroborated theories of all science.

Now I just used the word "theory". "Theory" in the scientific use of the word is different than the everyday language usage today. Most people today use "theory" as just a hunch, guess, belief, or proposal. Science uses the original meaning of "theory": a logical, systematic set of principles or explanation that has been *verified*—has stood up against attempts to prove it false. In my astronomy class, students learn about how Newton's theory of gravity explains the motions of falling objects on the Earth and the motions of objects orbiting each other and we also dabble a little in Einstein's theory of General Relativity to understand what happens with black holes and the development, the evolution, of the universe. Astronomy students also learn about the atomic theory and how it explains the type of light we see from objects and what we see when we spread that light out into its rainbow of colors. Physics and chemistry students learn those theories too and how those theories explain other observations. Since I'm an astronomer, I hope you'll understand if I toot astronomy's horn: astronomers have been able to verify that nature uses the same rules or laws everywhere in the universe and since it takes light a long *time* to travel the great distances, astronomers have verified that nature has used the same rules or laws throughout its entire history. Another thing astronomers have discovered is that the universe has changed, or evolved, throughout time, just as geologists have discovered that the Earth has changed, or evolved, throughout its history.

A few more notes about scientific theories. A scientific theory must make testable or refutable predictions of what should happen or be seen under a given set of new, independent, observing or analysis circumstances from the particular problem or observation the theory was originally designed to explain. For example, the seeming contradiction between Uranus' predicted position from Newton's celestial mechanics was explained by the presence of a previously unknown planet, Neptune, whose position was predicted from Newton's celestial mechanics. Astronomers found Neptune just where the theory said it should be. Newton's theory was not originally developed to explain Uranus' or Neptune's motions and it was tested via telescopic observations. Another example is the use of evolutionary theory to explain why the island of Madagascar hosts a peculiar group of primitive mammals called tenrecs. The theory makes claims such as an increasing separation of Madagascar from the rest of Africa, that the tenrecs would have been able to raft across the once much narrower channel between the island and the continent but the present channel is too wide for more advanced mammals to cross, and that the tenrecs should be much more alike each other than they are like other mammals both anatomically and even at the protein structure level. (see Kitcher p. 51-2) These claims can be tested via geology and other parts of biology independent of evolutionary theory.

A successful scientific theory will also be a unified theory, solving problems by using the same pattern of reasoning or problem-solving strategy again and again (Kitcher p. 46). In my astronomy class, students see that Newton's theories are applied in the same way to explain the motions and features of a wide variety of celestial objects and physics students use them to understand an even wider range of phenomena. (see Kitcher p. 46-47) We can use the construction of Darwinian histories of evolutionary theory to describe the emergence of a

particular trait in any organism or the relationships among groups of organisms. Using the same problem-solving strategy, evolutionary theory can also “explain why we find contemporary organisms where we do by following the course of their historical modifications and migrations” (called “biogeography”, Kitcher p. 50). The problem-solving strategy can also be used to answer questions of extinctions in the fossil record or our historical records by showing how the extinct organism’s characteristics were no longer advantageous when the environment or competition changed.

Finally, a good or successful theory will also be fruitful in opening up new and profitable areas of research. Newton’s theories led to improvements in our understanding of hydrodynamics, chemistry, optics, electricity and magnetism, thermodynamics, etc. “A flourishing science is incomplete... A good theory should be productive; it should raise new questions and presume that those questions can be answered without giving up its problem-solving strategies” (Kitcher p. 48). There were many questions Darwin and his contemporaries had but they trusted that future scientists would answer them in ways “consistent with the presuppositions of Darwinian histories” (Kitcher p. 53). Genetics now explains how new characteristics arise in populations and are inherited. Population genetics explains how variations in characteristics are maintained and how certain characteristics can be fixed. Ecologists can answer what interactions among populations of organisms affect the survival and fruitfulness of characteristics.

One last thing before I comment directly on intelligent design. Modern day scientists purposefully limit themselves to explaining natural phenomena using only natural causes. We have learned a lot about our world, our universe, by adopting a methodology of materialism, limiting ourselves to just matter, energy and their interactions. Adopting a materialistic methodology when doing science does *not* necessarily lead to philosophical materialism in which the existence of the supernatural, God, the spiritual dimension, “the More”, is denied. From the history of science, we see many examples of theists, those who believe in God, a transcendent spiritual reality, practicing a materialistic methodology. Isaac Newton, Gregor Mendel (the Austrian monk whose research with pea plants became the foundation of genetics), and Georges Lemaitre (the Belgian Roman Catholic priest who deduced from Einstein’s General Relativity that the universe must be expanding and that it began expanding from a very tiny volume a long time ago—the Big Bang) come immediately to mind. There are many theist (not atheist!) scientists today who are methodological materialists when investigating nature. The Vatican astronomers and myself are examples as well as at least some of your other science faculty colleagues.

Why do scientists limit themselves to materialistic explanations? Several reasons: The empiricism of modern science, the testing of explanations, relies on the regularity of nature, that nature does follow rules or laws. Otherwise, we could not trust observations as evidence. How would we know if the observation wasn’t the result of some supernatural whim? Controlled, repeatable experimentation would not be possible and any conclusions from them would not be reliable without assuming that supernatural entities are not intervening to violate natural regularities or laws. (Pennock quoted in Scott p. 249) Secondly, relying on supernatural explanations is a cop-out or a dead-end to deepening our understanding of the natural world. There would be no reason to continue looking for a natural explanation. When confronted with a very hard puzzle due to an inadequate theory or technology, we do not throw up our hands and

say, “God did it” and leave it at that—end of inquiry. No, if a natural cause for something is not known, the scientific approach is to say, “I don’t know *yet*” and keep on looking.

Finally, the “methods of science are inadequate to test explanations involving supernatural forces” (Scott p. 50). It is hard to do controlled experiments if one of the control variables is an omnipotent force. The scientist usually learns about nature by using controlled experiments in which only one thing at a time is varied to determine whether or not a particular situation, feature, or circumstance can be determined to be the cause of an observed effect. Well, as any theologian will tell you, you can’t control God, “the More”. You can’t put God in a box (or test tube). (Fans of C. S. Lewis’ *Chronicles of Narnia* will recall the Christ-like lion character, Aslan, is described as wild, “not like a tame lion”.)

As a scientist, who is also a practicing member of one of the world’s enduring religions called Christianity, I use science’s materialist assumption to find out more about the creation authored by God. Using that materialistic assumption while applying the tool of science has actually led me to a greater appreciation for the artistry that surrounds us. But that appreciation for the artistry comes from my religious roots and I recognize that it is not a necessary result of scientific study.

In his major work, *Origin of Species*, Charles Darwin, showed how a materialistic mechanism, called natural selection, could explain the changing characteristics of organisms, their development and their extinction through long stretches of time. That, of course, was what made his evolutionary theory so controversial over a hundred years ago and what makes it so controversial today. The problem is not that life evolves. Evolution was not a new thing in the time of Darwin. A hundred years before Darwin the French naturalist Comte de Buffon, wrote about the evolution of life. Others followed such as Geoffroy St. Hilaire, Jean Baptiste Lamarck, and Robert Chambers. Evolution was not a new idea. Having a plausible materialistic mechanism for evolution was new. Before Darwin, Lamarck also had a materialistic mechanism for evolution but it had several problems with it and so it was later abandoned. The idea of natural selection developed by Darwin (and also independently at the same time by Alfred Russell Wallace), was very plausible and was convincingly argued for in his book, *Origin of Species*.

Although the finding of a materialistic mechanism for evolution was in keeping with standard scientific practice, it immediately led to controversies between science and religion that are still with us today. And it wasn’t so much the finding of a materialistic mechanism in the natural world that created (still creates!) the controversy, it was finding it in the realm of *life*, and most particularly the development of homo sapiens, humans. Darwin skirted the application of theory of evolution to humans in *Origin of Species*, but that is where the real controversy was (is). The controversy is not so great with the development of the human body. People could accept that the human body evolved. The real controversy was (is) the application of his evolution theory to the human mind, morality, the human soul. Darwin made an attempt at applying his evolution theory to these areas in his later work, *The Descent of Man*, though that book’s arguments were weaker than those in *Origins* and even his supporters, including Wallace, did not buy them.

Philosophers and theologians understandably have a lot to say about what it means to be human. In Christian theology, this falls under the heading of “Imago Dei”—what it means to be made in

the image of God. This is one area of theology I love to read and discuss but I do come at it as an amateur. I am particularly interested in what science has to say about our *imago dei*. In order for scientists, theologians, and philosophers to come to a better understanding of the human race's relationship to the rest of the natural world, to each other, and to the transcendent reality of God, "the More", we need to properly represent each other's viewpoint and understand and respect the process of their fields. I do not think "Intelligent Design" (capital "I" and "D") has done that with science. I don't think it is good theology either but I'm going to restrict my comments to the science. However, I will say that the Bible's intent, like the scriptures of the world's other enduring religions, is not to *prove* the existence of God, but to help us *understand* God and our relationship to God.

### **Problems with Intelligent Design**

Intelligent Design (ID) believes that (a) the action of an intelligent being (though it could be "beingS") was involved in the evolution of organisms and (b) that there is enough evidence of this action to infer that it occurred and should be part of modern scientific thoughts and teachings. Now that intelligent being is usually a *supernatural* being (God). For the leading proponents of ID such as Phillip Johnson and Michael Behe (and probably William Dembski too), the intelligent being is the Christian God as viewed by the more "conservative side" of that faith. However, the ID proponents cannot publicly say that the "intelligent designer" is God because they would run into the constitutional restrictions of not being able to promote a particular religion in our public schools. In their discussions among Christian groups, it is clear that they are talking about the Christian God. Many who have followed the history of creationism see that ID is the latest version of creationism, though not necessarily the young earth, Noah's Flood geology creationism of Henry M. Morris and company. Also, the stated purpose for the creation of the Center for Science and Culture, the locus of ID work today, was "to replace materialistic explanations with the theistic understanding that nature and human beings are created by God."

I myself have no problem with part (a) of the ID belief. In fact, my belief is that God creates through evolution, what goes by the name of "theistic evolution", and is a belief held by most of the traditional mainline Protestant denominations (such as Presbyterians, Disciples of Christ, Episcopalians, and my own denomination, United Methodism) and the Roman Catholic Church. However, I, like the vast majority of scientists have a problem with part (b) of that belief. For the ID proponents, part (b) is crucial.

The key evidence for part (b) of the ID belief is that life is simply too complex to have developed via evolutionary processes. The idea of "irreducible complexity" falls under this part with Michael Behe being a leading spokesperson for this view. In *Darwin's Black Box*, Behe says that irreducible complexity is "a system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning." (Behe quoted in Coyne, p. 29) For example, the removal of one part of a standard 5-component mousetrap would render the mousetrap useless. Behe says that the various parts of biochemical systems such as the blood-clotting process or bacterial flagellum (the whip-like "tails" of bacteria they use to move around) could not have assembled together piece by piece to make the complex systems via natural selection. These complex systems would have to have arisen "as an integrated unit, in one fell swoop". In a recent article in the New Republic Jerry Coyne says that biologists have known for decades that natural selection "can

indeed produce systems that, over time, become integrated to the point where they *appear* to be irreducibly complex. But these features do not evolve by the sequential addition of parts to a feature that becomes functional only at the end. They evolve by adding, via natural selection, more and more parts into an originally rudimentary but functional system, with these parts sometimes co-opted from other structures.” (Coyne p. 30) So for the mousetrap analogy, three of the parts can be used as a tie clip or paper clip, two of the parts can be used as a key chain, one part can be a fishhook, another as a paperweight, etc. The various parts had other functional uses. For each of the systems Behe has described in his various writings, biologists have shown how those systems could have arisen via evolution with natural selection.

Behe appeals to ignorance of a natural mechanism to argue for a proof of a God-action. As I mentioned above, this is not good scientific practice because appealing to a supernatural cause is a cop-out or a dead-end to deepening our understanding of the natural world. There would be no reason to continue looking for a natural explanation. Also, this argument of Behe’s is just like the “God of the gaps” argument that theologians have rejected. For theologians, the God in the gaps argument reduces God to irrelevance as more and more gaps are filled in.

Along the same lines Behe’s irreducible complexity is William Dembski’s “specified complexity”—a characteristic trademark or signature of an intelligence. The signature is an event that is “contingent and therefore not necessary; if it is complex and therefore not easily repeatable by chance; and if it is specified in the sense of exhibiting an independently given pattern” (Dembski in *Natural History Magazine*). Dembski’s process filters out events that are common natural regular events and rare events that happen purely by chance to hone in on the ones that have a specified small probability of happening. But it looks like a God in the gaps argument again. Dembski states that “Something that’s specified and complex is by definition highly improbable with respect to all causal mechanisms currently known.” (Dembski in his online “Intelligent Design Coming Clean” article). However, something can be falsely attributed to design because of missing or unknown information at the natural law level. He says in the piece that he’s not arguing from the position of ignorance, but I’m not convinced. His technique is good, though, for finding which topics in the current state of scientific knowledge are especially weak and need to be researched. But I don’t see how it proves that a God-action must have happened and why science has to open itself up to supernatural causes instead of adopting its very successful approach of saying “I don’t know *yet*” and keep on looking for the natural cause.

Dembski complains that science doesn’t see design because it is committed to methodological materialism. He’s right! Science *does* purposely limit itself to materialistic explanations because that *is* the nature of science. I outlined some reasons why science purposely limits itself to materialistic mechanisms. Science cannot prove God exists and neither can it prove that God does not exist. Science is not meant to be the all-encompassing, be-all, end-all of human endeavors. There are some scientists who make the leap from methodological materialism to philosophical materialism, but that is a leap of faith. There are other scientists who do not take that leap. But neither do they use science to prove their faith in a transcendent reality. Using science to prove God exists actually just proves a human invention, not the God we are drawn to worship. Using science to prove that God does not exist is just disproving a straw man type of proposal, an invention of the human imagination, not the transcendent reality I worship. Now I could talk about why I do believe in God, but that’s the topic of another talk...

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