

Correcting the Creationist

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Important question

Is creationism a science? Many creationists claim that it is. In fact, creationists spread their beliefs under the general heading "Creation Science". But is creationism *really* a science? This article is an attempt to answer that question.

Creationists require that we accept the bible as literally true. This is to say that the bible must be accepted through *faith*. On the contrary, scientific theories are not accepted through faith. They are always under scrutiny and are constantly subjected to attempts at falsification. The idea that a scientific theory must be falsifiable in principle is crucial to the development of science. If scientific theories were not subject to attempts at falsification they would never change (or evolve) because people would not bother questioning their accuracy. But creationists believe that their claims -- or rather, the claims of the bible -- are immune to attempts at falsification. This means that their ideas can never change and cannot be modified in light of new evidence. They are set in stone, unchanging for all time. In this way creationism cannot be considered to be a science.

Science is Not a Religion

Creationists claim that the bible should not be questioned or subject to any real scrutiny. For a creationist, the words of the bible are literal truths that must be accepted, not through reason, but through *faith*. Given the requirement of faith, it is difficult to see how creationists can sensibly assert that their study of the bible and creation is a *scientific* endeavor. Science, unlike religion, is based on asking questions and scrutinizing evidence and hypotheses. When challenged on this, many creationists accuse scientists of having faith in their theories, or faith that science can explain all the mysteries of the universe. For the creationist, science is just another religion -- not the correct religion, but a religion nonetheless. This type of accusation implies a misunderstanding of science.

To have faith in something, one must accept that thing to be true with no evidence; but this is not the way science works. Indeed, no scientist

should have "faith". It would not be rational for a scientist to simply believe by faith that science is always right. This is because there are so many instances in which scientific theories have been shown to be wrong. Science is in a constant state of evolution. Accepted theories of the past have been refined and changed giving us a more precise world-view. A science that does not change and can not be questioned would not actually be science. This is because one of the defining features of science is its openness to refinement in the light of new data.

On the other hand, the prophecies and claims of the bible can never be considered scientific because they require people's acceptance with no question. There is no room for development of the bible's claims in light of new evidence. If someone questions the accuracy of a prediction in the bible, the answer is usually an unsatisfactory cover-up such as "... we have misunderstood..." or "... the dates are inaccurate..." or "... God may have changed his mind..."

Imagine how difficult it would be to understand the world if science worked that way. Suppose that someone challenged Newton's law of gravity by pointing to the anomalous orbit of Mercury and scientists responded by saying *"Oh, that's alright ... the law of gravity doesn't ALWAYS work ... we don't know why it doesn't always work, but it could be that we are misunderstanding God's intentions. What's important is that we have faith in Newton's theory and continue to accept it."* If this answer were accepted, Einstein's theory of gravity would never have had a chance despite the fact that it *does* predict the strange orbit of Mercury.

Do Predictions make Science?

One of the reasons the creationist believes that a study of the bible is scientific is because it makes predictions about the future. These predictions are contained in the Book of Revelations and can, presumably, be tested for accuracy by waiting for the events to occur. Many Christians believe that some of the predictions made in the revelations have already occurred, thus proving its accuracy. A popular example concerns the so-called "mark of the beast". The revelations state that at some point in time, everyone on Earth will receive a mark on either their hand or their forehead. According to the passage, the mark will be essential for people to buy and sell goods and exchange services. People who believe the accuracy of this prediction claim that it is already coming true. They believe the prediction refers to "smart-card" technology. Smart-cards are like credit cards that contain micro-chips which hold information about their user's bank accounts, medical status, employment record, and personal details. It is interesting technology that is not widely used as yet. In the future, however, it is conceivable that people will need to be issued with smart-cards in order buy products and generally participate in society.

On the surface it seems to be the case that the bible has made a prediction that was tested and verified. But do the existence of smart-cards really verify the bible's claims? Sadly for the creationist the answer is "no". The reference to the mark of the beast can be interpreted in many different ways. It is likely that throughout history people have made a variety of interpretations that are based on what is going on at the time. The idea that no-one can buy or sell without the mark of a beast could be interpreted as meaning that bartering will no longer exist and people need to use money. Or it could be interpreted as meaning people need to be citizens of a nation to live and work in that nation. Or it could be interpreted as people needing bank accounts or ATM cards. In a few years people may interpret it as meaning goods and services will only be available over the internet. Who knows? All these possibilities are equally plausible and since they all make sense it is impossible to tell what the prediction means. The prediction could be taken to mean just about anything, and as such it can never be verified.

Falsifying the word of God

One of the requirements of science is that it satisfies the "falsifiability" principle. This means that for a theory to be scientific it has to have the possibility of falsification because without such, it is trivial and tells us nothing useful. Here are a few examples of assertions that are falsifiable:

1. It never rains on Wednesdays
2. All substances expand when heated
3. Objects fall towards the Earth when released within Earth's gravitational field.

The first assertion can be falsified by simply making several observations of Wednesday's weather. If it rains one Wednesday, then we can say that the assertion has been falsified. The second claim can be falsified by finding a substance that does *not* expand when heated. As it turns out, heating ice until it melts can falsify this assertion. Assertion 3 is true as far as we know, however it is falsifiable *in principle*. It is logically possible that a brick may fall upwards when released, its just that so far this has never happened. If it did happen on one occasion, then we would discover an inconsistency in gravitational theory and scientists would then work to make our understanding more complete. In the meantime, however, every time we watch a brick fall to the ground our confidence in gravitational theory is strengthened. This is how science works and progresses. Now, consider the following assertions:

1. The mark of the beast refers to a cashless society
2. Jesus was the son of God

3. God created the Earth and all life in 6 days

You can see that the first two claims are not scientific because they cannot in principle be falsified. Assertion 1 is simply a definitional claim which is no more interesting than a statement such as "a bachelor is an unmarried man". The claim that the mark of the beast refers to a cashless society is simply an interpretation that defines it as such. No-one knows what the author of the bible intended the mark of the beast to mean, and since we cannot ask the author it is impossible to falsify the assertion. The second assertion cannot be falsified because no test will ever exist to show that it is untrue. Even if Jesus was still alive and we tested his DNA to show that he was completely human, the Christian response would be something like "yes, that's because God wanted it that way". Since this response would be given to any attempt at falsification, we can see that the claim cannot in principle be falsified. The assertion "Jesus was the Son of God", thus remains a statement that must be accepted with no possibility of being falsified. It is not scientific. In the case of the third assertion we have an interesting situation. The claim that God created the Earth and all life in 6 days *can* be falsified in principle. Scientists offer a possible explanation for the origin of the Earth and life that goes something like this:

The Earth arose approximately 10 billion years after the big bang due to the accumulation of stellar matter left over from the formation of our sun. During the next 1 billion years, the carbon, methane, nitrogen, oxygen, water, and hydrogen in the Earth's primitive atmosphere were exposed to intense electrical discharges produced by severe lightning storms. The atmosphere was also exposed to high energy level ultraviolet radiation produced by the young sun. The effect of this exposure broke the atmosphere's composite molecules apart and caused them to rearrange which gave rise to hydrocarbons and amino acids -- the building blocks of life. Over time, electrical discharges in the atmosphere caused the formation of adenosine triphosphate (ATP), which bridges the gap between non-living chemicals and living chemical structures. ATP is thought to provide the energy needed for amino acids to assemble into complex structures such as proteins. From this point a journey of 3.5 billion years of evolution by natural selection gave rise to the complex forms of life we see today -- including the human species.

The interesting thing is that Creationists in this case deny that their story is subject to the principle of falsification. They state quite firmly that the bible is the literal truth and should not be questioned. It must be accepted as true that God created the Earth and all life in 6 days and, furthermore, any evidence to the contrary was either fabricated by God or misinterpreted by scientists. Of course, denying that the biblical depiction of creation is subject to the falsifiability principle is to deny that it is a scientific theory. So, if the creationists wish to maintain this stance, they must accept that creationism is not science.

Being good scientific theories, on the other hand, the Big Bang and evolution theories stated above must be falsifiable in principle. One way in which they could be falsified would be the confirmation that the universe is infinitely old, and that life on Earth had an extraterrestrial origin. The panspermia theories that were popular during the 19th century suggest that primitive life may have originated in space and traveled here on meteorites and comets. This idea has become popular again with the suggestion that a meteorite's remains contain fossilized bacterial type structures. Notable scientific figure Francis Crick has even suggested that life may have been deliberately launched to Earth by extraterrestrials. I think, however, this is an extraordinary suggestion that needs extraordinary evidence before it can be taken seriously.

Creation: Science or Not? Let's set the record straight.

Creationists spread their beliefs by misleading the general population into thinking that their study is scientific. By using terms such as "creation science" creationists convince people that acceptance of the literal truth of the bible is a viable alternative to the acceptance of contemporary science. But it is all trickery. Creationists do not agree with scientific method and it is therefore contradictory for them to label their belief system as science. For a theory to be scientific it must be falsifiable in principle. This means that there has to be a possible way in which a theory can be shown to be inaccurate. As attempts to falsify a given theory fail, we can say that our confidence in that theory increases. However, when an attempt at falsification succeeds, scientists must work on amending the theory or put forward a new theory. Creationist statements do not satisfy this criterion. Many of the claims of the creationist do not have the possibility of falsification because any attempt to do so will be incorporated into the original claim. Furthermore, for the creationist, the words of the bible must be taken as being literally true and are not subject to falsification. This is to say that the bible's claims must be accepted with faith and not questioned. Because falsification is a requirement of scientific theory, and because the creationist claims immunity from falsification, it is clear that creationism is not science.

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