

## THREE CREATION MYTHS AND THEIR VALUE FOR SCIENCE

*Jon Garvey*

I want to compare three examples of creation myths. I'll put my reasons upfront. It is often (and stridently) said that science provides the only rational, evidenced, account of the reason for the existence of the Universe. Religion, on the other hand, peddles merely opaque, and ultimately meaningless, myths. More specifically materialist naturalism says that religiously-based assertions have never predicted a single substantiated scientific advance, and so are intrinsically worthless. Or even, in Richard Dawkins's celebrated view, delusional.

So, for example, the "god hypothesis" popularised by Carl Sagan pictures primitive man invoking a deity to account for the otherwise inexplicable world around. But because science finds that world to be explicable in terms of natural law, the god hypothesis is demonstrably wrong, or at least redundant. Creation myths, in other words, vanish like morning mist when the light of scientific day appears.

But things are never as simple as they seem. It is not easy to define a creation myth. Indeed, none of the originators of the three I will use would have accepted them as such and they were actually intended for quite disparate purposes.

My oldest, the Babylonian poem called *Enuma elish* after its first line, was sung to justify the worship of the god Marduk as the most important in the state religion. It has elements of a teleological tale ("The world is like this, and here's why"), but proposing "the god hypothesis" is not its main function. Indeed, although ancient Babylon achieved much in the field of science, including astronomy, this would seem to have been completely independent of *Enuma elish*, which belongs to the realm of religion and not of natural philosophy.

My second, the somewhat more recent creation account in Genesis 1, forms the introduction to the foundational documents of the Hebrew Scriptures, the *torah*. It was almost certainly written as an anti-polytheistic polemic, showing the newly-monotheistic nation of Israel why their single God was radically different from the gods of Egypt, Canaan or Babylon, and therefore why their covenant relationship with him was unique and important. Again it was not generated by hunter-gatherers spinning teleological yarns around campfires: like *Enuma elish* it assumes the deity's existence rather than proposing it. However, because it was claimed to be directly inspired by the God who gave Israel *torah*, it was expected to be in essential accord with physical reality, and in that sense only can be called "scientific".

The third "myth" is the contemporary *Multiverse hypothesis* (or strictly, "hypotheses", since there are several variations). This, of course, is not seen as a myth by its proponents, but as a scientific theory. Nevertheless in point of fact it is even more of a teleological tale than the other two, for it was devised specifically to account for the observations that our universe has an extremely high degree of order, and that it started at a fixed point in time – information that was not available to the ancients. The problem is that multiverses, if they exist, are outside the present space-time

continuum. That is, they are outside the Universe and therefore, even in principle, are not accessible to science. At best, mathematics can show that they are conceivable. But they cannot constitute a theory because physical evidence for them will never be available (since multiverses are beyond physical space). Even if they are deemed a hypothesis, such a hypothesis is unique in being known in advance to be forever unprovable. And that places multiverses in the same category as creation myths – speculations about the origin of the universe that cannot, at the time of their composition, be falsified. The difference with multiverses is that our present scientific knowledge predicts that they can *never* be falsified. Moreover, the multiverse hypothesis is a myth because it shares with the other two stories the privilege of being the only game in town for their respective communities: currently variations on the multiverse theme are the only tenable naturalistic explanation for our existence.

So I will tentatively define a creation myth as follows: it is a story that (whatever its principle purpose) explains the origins of the Universe based on current knowledge, but which cannot at the time of composition be scientifically validated. By that definition, *Enuma elish*, Genesis 1 and the Multiverse hypotheses are creation myths. It simply remains to see which, if any, have predictive and therefore scientific value. Let's look in specific detail at each of them, with that purpose in mind.

### **Enuma elish**

In the Babylonian myth, the earliest event is the mingling, in some sort of sexual union, of Apsu the sweet water with Tiamat the bitter water, producing sediment in the form of the first generation of gods. These have other offspring through intermarriage, but soon the gods' misbehaviour causes Apsu to plot to destroy them (despite the protestations of Tiamat). However Ea, the sun god and son of Anu the empty heaven gets wind of this and kills Apsu. In revenge Tiamat and some other gods plan to destroy the culprits, but Ea's son Marduk defeats her, and creates the world from her body, and mankind from the blood of her commander in chief, Kingu.

Now it would be unfair to ignore the role of metaphor in such a story. We simply cannot know how literally the Babylonians would have taken details of the myth. But we can envisage that a Babylonian scientist, trusting that this account represented reality, would be looking to corroborate some basic truths within nature.

Firstly, and most importantly, there ought to be evidence of a dualism throughout the structure of the Universe. The story says that Apsu and Tiamat coexisted in the beginning, founded everything and yet retained separate – and even antagonistic – identities thereafter. Those two fundamental natures ought to be represented in the fabric of the Universe.

Secondly, the formation of the Universe having been unconscious, or accidental, or even the result of conflict, one would expect disorder and chaos to be behind the superficial patterns seen in everyday life.

Thirdly, these two primeval forces began, and remained, within the material Universe – indeed, Tiamat's body is still around us constituting the earth and sky. One would therefore expect there to be nothing beyond the physical Universe.

Fourthly the account implies that sweet water and bitter water existed from eternity, only their mingling at some random point in time beginning the changes that led to what we see today. Therefore the Universe ought to be found to be eternal, in accordance with the commonest scientific opinion until the Big Bang Theory took hold.

Thereafter one would hope to find evidence to back some of the lesser details, for example that the sun formed from empty space, that the original two constituents of the Universe have perished (and that the earth is what remains of one of them), that mankind's chemistry is significantly different from everything else on earth, being formed from the blood of Kingu rather than the body of Tiamat, and so on. Certainly one would expect to find great variation in the physical laws governing the domains of the many different gods, at a lower level than the fundamental duality of the Universe caused by the natures of Apsu and Tiamat.

Needless to say none of this is borne out by the discoveries of science. There is no trace of a fundamental duality in nature, still less of different laws operating at different points in the Universe. The same physical laws, and the same four interacting fundamental forces, operate throughout the cosmos. Far from the Universe being underpinned by chaos, it is the mathematical elegance of its structure that so impresses cosmologists. It is the fine tuning of the four forces that gives the overwhelming impression of design expressed in the anthropic principle (see below), such that it requires a lengthy evolutionary apologetic to maintain that this appearance of design is merely illusory, though so convincing. The Big Bang refutes both the self-sufficiency of the universe, and its eternal existence.

Nobody would even take time to refute the lesser propositions in the light of this. Astronomers would not be surprised to discover suns being formed from gas clouds, rather than empty space. Cosmologists would soon stop searching the background radiation for evidence of the two dead fundamental constituents of the Universe. Biologists would not resign their posts when they uncovered the similarities between human and animal biology.

Unfortunately for the Babylonians, *Enuma Elish* has no predictive value for science at all. Quite possibly they never believed it would. If they had, they would certainly have been profoundly disillusioned.

### **The Multiverse Hypothesis**

At the opposite end of the range chronologically, multiverses only escaped from the realm of fantasy writing because of the order that science has discovered throughout the Universe. As knowledge grew, people began to remark on how singularly suited to human existence the cosmos is. In particular, the understanding of quantum mechanics and the four fundamental forces made the Universe look not inevitable, but actually highly skewed in our favour. It could be calculated that tiny variations in the apparently random values of the forces would result in a universe that would collapse immediately, explode into a fine gas cloud, be incapable of forming objects at all or any other number of chaotic possibilities. The observation that the world seems to be a put-up job is known as the *anthropic principle*.

The naturalistic answer to the anthropic problem can be given at a biological level fairly plausibly. The world seems miraculously suited to our existence simply because if it weren't, we wouldn't be here. Evidently the physical conditions on our world were suitable for the formation and evolution of life, and we even have an elegant theory for the latter, based on ordinary chemistry, that seems to work well. Those ideal conditions might be rare, but the Universe is so big that there must be many millions of planets where conditions are similar enough for the same processes to have occurred by chance.

There are certainly flaws in that account which are usually understated – notably that there is no adequate theory for the origin of life. But nevertheless naturalist scientists can still assert that if life happened here, there are plenty of other places where it could also happen.

There is a bigger problem, though, when it comes to the physical laws of the Universe. Nobody can now deny that the values of the four fundamental forces are highly (and inexplicably) skewed in favour of the kind of Universe that can produce rational beings. And yet those forces only exist within the Universe, and have done so since an infinitesimal time after it began. Nobody can deny the mathematical precision that underpins physics, and that only the most intelligent humans can comprehend. We live in a rational universe, and it produced us as beings who can perceive that rationality. For such things to happen by chance and form the totality of existence is simply impossible.

...Unless, of course, the Universe is not all there is. Suppose, in some way, that our Universe were one of an infinite number, in the same way that our planet is one of an effectively limitless number within the known universe. That could happen in various ways – new universes might bud off from a proto-universe, or be formed when black holes in existing universes collapse, or maybe nothingness is so unstable that universes keep appearing spontaneously. Each of these new universes would have its own “laws”, most of which would actually be pretty lawless and so lead to chaotic systems of one kind or another. But given an infinite number of such universes, it would not only be possible, but *inevitable* that an ordered, mathematically precise universe would eventually form, and so appear to us, its progeny, as the only possible Universe.

I should point out again that the concept of multiverses is entirely speculative. It has been developed teleologically to explain the brute fact of our very special Universe. But not only does it lack any actual physical evidence: it is theoretically inconceivable that any evidence will ever be found. Quite simply, science depends on the fortunate coincidence of a rational and uniform set of physical laws, employing those laws to explore the realm in which they alone operate, that is the known Universe. There is simply no way science can use the laws of this universe to explore another universe with a completely different set of rules. Indeed, since the whole hypothesis has been set up to explain why it's possible to explore this Universe so successfully, the chaos of any of the less fortunate universes would prevent us learning anything from them, even were we able somehow to break into them.

Science has as much ability to confirm multiverses as it has to devise an experiment to explore the throne-room of heaven. Multiverse Theory is intrinsically speculative, and therefore constitutes a modern myth, and not a scientific hypothesis at all.

But although multiverses cannot be explored physically, do they not at least provide a provisional explanation for the Universe we see around us? As we have seen, *if* there were an infinite number of randomly configured universes, one like ours would inevitably turn up in the end. *Ergo*, if we want to avoid the distasteful alternative of special creation by a divine mind, alternative universes simply must exist. They predict correctly, therefore they are.

Unfortunately there is a fundamental fallacy here, which arises from the false comparison between the anthropic principle as applied to biology and as applied to cosmology.

In biology it may be said that since life arose naturally on an ordinary planet (though we must not forget there is no theory to confirm that) and evolved into the rich variety we see (for which there is a lot more evidence) then the same must have happened elsewhere. There are trillions of planets, which is effectively an infinite number, and the same physical laws operate on the same chemical substances.

Even in this case there are some pitfalls: the first is that a single event cannot be used to predict a pattern. Whatever the plausibility, we still have only one example of an inhabited planet, and you cannot justifiably draw a graph through one point. The second is that there are indications, described by Peter Ward and Donald Brownlee in their book, *Rare Earth*, that the conditions necessary for life, even in naturalistic terms, may be so rare as to be unique to our planet. The Universe is big, but it may be an error to treat it as infinite. If the statistical odds are slim enough, some theoretical possibilities will not happen.

This problem may seem not to apply to multiverses. There is no reason, unlike the planets of the universe, to exclude the possibility of a literally infinite number of universes over an infinite length of time (or better, since time is a physical feature of our Universe, an infinite number of universes over an eternity). Given infinite time and infinite space almost anything can happen. In fact, anything not self-contradictory *will* happen.

A little thought will show that this very inevitability makes the Multiverse hypothesis useless for scientific prediction of our own existence. According to Multiverse theory a Universe like ours not only *may* happen. It *must* happen. And it must happen repeatedly. How likely is a universe like ours? One in a million? No problem. One in a trillion? Same likelihood. One in a googolplex? Happens all the time. One in infinity? Here we are, so it happened. In fact, what are the chances that not only a Universe like ours, but one identical in every detail down to this article, exists somewhere? Inevitable. There must even be several examples of universes based on the mingling of sweet and bitter water and a human race made from clotted god-blood.

Multiverses explain nothing because they explain everything. Their predictive value is therefore zero, and they cannot in any sense be regarded as scientific. And that

probably explains why nobody proposed them until science showed them to be the only viable alternative to God.

## Genesis 1

As in the case of *Enuma elish*, it is unfair to stumble over the use of metaphor in the Genesis account. Not only are we inevitably unsure of just how the original readers would interpret it in their ancient culture, but we must take into account its original purpose. If indeed it was a polemic against the surrounding polytheist societies, then it would naturally adopt generally familiar cosmological ideas. If your readership has been told in Egypt that the origin of the Universe was Nun, the ocean of primeval chaos, then your purpose would be served better by explaining that the waters were actually created by Yahweh than trying to explain to a pre-scientific people about the space-time continuum being, in actuality, what God had created. Even if such a concept would make any sense to the equally pre-scientific writer.

Instead, we should look at the core beliefs in the story, just as we did with the Babylonian myth.

Thus we find that Genesis begins with the radical statement that “*In the beginning, God created the heavens and the earth.*” Western scientists tend to assume that such a creator God is the universal superstition which has to be debunked. But actually it is a concept unique to the religion of Israel, though Christianity and Islam have consciously adopted it and it may well have informed the ideas of the much later Greek philosophers like Aristotle. It is radical because it proposes a single God, antecedent to and outside the universe, who deliberately creates the entire Universe as a sculptor would create a work of art. He doesn’t mingle, or weep, or bleed, or die as the pagan gods do – he simply creates.

Genesis goes on to describe a creation that is initially disorganised – the earth is formless, and the deep (equivalent, of course, to the heavens in the previous verse) are dark. This is no more the formlessness or darkness of chaos than is the potter’s initial lump of clay. It is simply the creation of building materials. Upon this relative disorder God then progressively imposes a planned order, represented in sophisticated literary form in the six days of creation. So the first 3 days show the differentiation of the heavens from the earthly realm, then of atmosphere from sea, then of sea from land. The second set of three days shows the population of each of those realms, culminating in the rationally god-like animal, humankind.

To spot correlations between the days of creation and earth’s physical history is to miss the point, which is that God’s week of work is a job that is one person’s planned activity, executed with a clear goal: a peopled universe. If it is geocentric, that is mainly because it is written for human worshippers, not physical scientists; but also because it wants to teach that the highest result of God’s progressive creation is a rational consciousness that mirrors his.

A hypothetical Hebrew scientist (akin to the Babylonian one I postulated earlier) would have a very different set of expectations in his exploration of nature. Firstly, he would not expect to find God himself – merely evidence of his handiwork in nature. Secondly he would expect to find evidence of God’s unity of purpose in the way the Universe operated, and he would also expect to find the appearance of conscious

design, rather than the random fallout from divine warfare and death that polytheistic myths would imply. Thirdly he would expect to find evidence that the Universe itself had a beginning, and a boundary, and is not eternal or infinite. And lastly he would expect the rationality of the human mind to image the mind of its Creator – in other words, he would expect to understand the cosmos, at least to a degree.

Of course, there were no such Hebrew scientists in ancient times: natural philosophy was not apparently a mainstream activity of the Israelites, except perhaps for someone like King Solomon. But actually there have been more recent examples of scientists who pursued their study of the Universe with exactly these expectations, based on the creation doctrine of Genesis. I speak, of course, of those western scientists influenced by a Biblical worldview, and in particular those in Christian countries after the Reformation.

Indeed the Genesis account can arguably be affirmed as the hypothesis that underpinned the whole beginning of the modern scientific quest. People such as Bacon, Kepler, Galileo and Newton (together with many others) consciously sought to find the marks of God's handiwork in what they observed. Not all were orthodox Christians, but they all subscribed to the overall view of creation propounded in Genesis, not in a literalistic "Creationist" way, but according to the general principles of understanding I have outlined.

So in the context of post-Reformation science, we can genuinely call Genesis 1 a scientific, falsifiable hypothesis. And we can ask to what extent the evidence of the subsequent centuries has falsified, or validated, the predictions of that hypothesis.

### **The testing of the Genesis hypothesis**

In the first instance then, has science found God within the Universe?

Evidently not, or no scientists would be atheists. This is, of course, as predicted by the hypothesis, for the God of Genesis is outside his creation physically. Indeed it is notable that those who restrict their methodology to the scientific method will seldom become true theists (and if they do, it is likely to be through other means). Those who limit themselves to the existing scientific evidence tend to be agnostics. Those who ask the "Why?" behind the evidence tend to become Deists; one recent example being Anthony Flew, who still finds an active role for God in his Universe difficult to accept. This is to be expected, since even St Paul says that, without revelation, humans ought to be able to discern God's eternal power and deity from what has been made – but no more, or the Gospel would not be necessary.

Secondly, has science found evidence of unity of purpose, and the appearance of design, in the cosmos?

As to the first, the unity of the physical laws across space and time gives a very strong affirmative. As to the second, there is the evidence of the mathematical foundation of all things, the fine-tuning of the fundamental forces and the progressive refinement of matter culminating in the mystery of rational human life. Even the militant atheists admit this gives "the appearance of design" though they deny the actuality.

Thirdly, has science provided evidence that the Universe had a beginning, and is finite?

Before the evidence for the Big Bang became compelling, the idea of a non-eternal Universe was actually repellent to many scientists. Not only did it cut across the Greek philosophy that was considered the intellectual progenitor of science, but it was thought that it would provide persuasive evidence for the unwelcome existence of God. The Universe ought to be able to explain itself, or at least just *be*, from everlasting to everlasting. Even in my youth, Fred Hoyle's Steady-State theory was generally considered more likely to be true than the Big Bang. A Universe limited in space and time undermined not only naturalistic expectation, but virtually every worldview other than the Judaeo-Christian tradition from Genesis.

But it nevertheless turned out to be true, as predicted by the Genesis hypothesis.

Fourthly, does the Universe turn out to be comprehensible? Do our minds tune in to its structure?

We can now affirm that the operating principles of the Universe may be understood by humans (though not without difficulty) right back to its origins in the Big Bang. Philosophers of science find the comprehensibility of the Universe one of its biggest mysteries. It is one of the "loaded" features of our cosmos that led to the stating of the anthropic principle. There seems no rational cause for the Universe to be rational to us. The fact that it is, however, matches the expectations the early theistic scientists gleaned from Genesis 1: made in God's image, we can think God's thoughts after him (as Kepler is reputed to have said).

### **The Genesis Hypothesis – true or false?**

We have seen that the creation story of Genesis 1 was, at least informally, taken as a hypothesis by key figures in the early history of science. It predicted four key findings:

1. The material absence of the designer in a well-structured Universe,
2. Evidence of unity of purpose, and the appearance of conscious design,
3. Evidence that the Universe is finite and had a beginning in time,
4. Evidence that the Universe is comprehensible because man's mind is made in the image of the mind of the Creator (as it reveals itself in the creation).

All four of these predictions have been borne out by the discoveries made in the subsequent few hundred years. In this instance then, a hypothesis based on a pre-scientific religious text held to be divinely-inspired has been shown to have predictive value at every point.

This is in marked contrast to *Enuma elish*, which has no predictive value at all because science has not validated the predictions one might base on it. It is also in marked contrast to the *Multiverse hypothesis*, which has no predictive value at all because it predicts any and every eventuality. In any case the latter was only formulated, after the event, to explain evidence that had already been gathered.

The first major premise in Genesis 1, "In the beginning, God created..." is, in the terms of Genesis itself, not testable by science. For this reason it would be improper to

include this as part of “the Genesis hypothesis”. It is entirely reasonable, however, to wonder whether a text that is demonstrably true where it can be tested scientifically might also be true where such testing is impossible.

This brings us into the area of revelation, which is strictly in the non-scientific realm. Why was Genesis able to predict the big conclusions of the modern scientific quest, though written several thousand years earlier in a non-scientific culture? I can think of two possible reasons.

Firstly, we may just happen to inhabit a Universe where the four fundamental forces not only make human life possible, but also dictate the accuracy of Hebrew creation myths.

Or secondly, the God who planned his Creation so meticulously is also capable of speaking into it.

[\*\*The Hump of the Camel\*\*](#)