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The Miracle of Life, The Universe and Almost Everything

A life-permitting universe

In the past, we sought to explore the world, to seek out unknown land and cross seas to find where the map ended. Now we've done all that, yet we still carry the same spirit of adventure, so instead of looking across we look up into the skies and down through our microscopes. We want to know more about the universe in all its majesty and fine complexity.

Throughout the last few centuries, every scientific discovery has added to the kaleidoscopic picture of an increasingly complex and finely balanced universe. Each new discovery in physics has shown that the laws of nature, the constants of physics, and the initial conditions present at the beginning of the universe are very finely tuned. For example:

- One of the key forces of nature called the weak-force which operates in the nucleus of an atom is so finely tuned, that an alteration of this force by just one part in 10^{100} would prevent a life-permitting universe. That's 10 followed by 100 zeros.
- The explosive force of the Big Bang had to be within 1 part in 10^{60} for life to be possible. This means if the big bang had been even the slightest bit weaker, gravity would have made the universe collapse back in on itself almost immediately, and if the big bang had been just the slightest bit stronger, particles would have dispersed literally into nothing. Now this probability alone can be compared to firing a bullet toward the other side of the universe, twenty billion light-years away, and having the accuracy to hit a one-inch target.
- For the universe to be life-friendly, the gravitational constant must be finely tuned in 1 part in 10^{34} , the electromagnetic force versus the force of gravity must be in 1 part in 10^{37} , the cosmological constant must be in one part in 10^{120} , and the mass density of the universe must be 1 part in 10^{59} .
- Sir Roger Penrose, professor at Oxford, one of the world's leading mathematical physicists, suggests that the probability of a universe having conditions conducive for the formation of life is less than 1 in 10 to the power of 10 to the power of 123. Just to put that into perspective if all the matter in the universe was turned into paper, there would still be far too little paper to print the required number of zeros to write that as a percentage.

With all the different configurations this universe could have taken, out of the many different possibilities, our universe is configured to allow for the existence of life. This seems odd given that fact that all the evidence suggests that a universe that doesn't allow for life is far more likely according to physics than a universe that does. So how has this happened? You might say it's a coincidence, but you can only gamble on so much chance. The mathematical odds for a universe to

be stable enough to permit life is so incredibly small, that chance and necessity are practically invalid explanations.

What's fascinating about these finely and precisely balanced variables of our universe is that they are:

1. Contingent (It is easy to conceive of them being different, e.g. that the mass of a proton or the expansion of the universe could have been quite different from what they actually are);
2. Extraordinarily improbable and balanced to an infinitesimally small degree, and;
3. Independently specifiable (they are exactly what is needed for there to be life).

These three remarkable features shocked scientists and philosophers as together they constitute what is called the 'design filter'. Also, there is no known cause of fine-tuning observed today that is possible without the aid of mind. In fact, the only cause of fine-tuning of anything in nature that we know of is intelligence. For example, the tuning of any machine doesn't happen unless an engineer does so. Using a cause-effect relationship from observations today, we can suggest that the fine-tuning of the universe required intelligent activity. This intelligence we associate with God Himself.

There are hundreds if not thousands of "dials" (constants of nature; hard facts about the universe) each of which have a wide range of alternative settings (values), yet each dial is set to precisely the correct setting to allow life to appear. The seemingly miraculous occurrence of numeral values that have been assigned to the fundamental constants of nature gives the unavoidable impression that the present structure of the universe has been carefully thought out.

Consider this illustration: Imagine you bought a lottery ticket and you got the winning numbers, and then for next year, every weekend, you buy another ticket and win millions upon millions every time. You're no longer going to think this a coincidence, something must have been tweaked in the lottery system for it to stay in your favour. Someone must be behind it. In a similar way, the fine-tuning of this world presents the ultimate fine tuner, God, as ever more apparent.

The fine-tuning arguments have been so influential that even outspoken atheists have claimed to be "greatly shaken". After reflecting on his discovery, Sir Fred Hoyle said- *"A common-sense interpretation of the facts suggests that a super-intellect has monkeyed with physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature."*

The multiverse

To avoid the reality of this conclusion, some have suggested that maybe there is not just one but an almost infinite number of universes, and if so, then perhaps it is not surprising that by chance one of those universes would end up life-friendly: ours. The logic says that given enough chances, every improbable kind of thing will probably happen eventually so in this scenario we wouldn't need God. This idea is called the multiverse but it's merely a metaphysical guess.

Mathematically this universe is still as improbable no matter how many unconnected universes exist. Richard Swinburne, one of the most influential British philosophers of religion at this time said that *"it is the height of irrationality to assume an infinite number of universes never causally connected with each other, merely to avoid the hypothesis of theism."* There is no scientific reason to believe in an infinite number of universes, but even if there was a plausible scientific reason, this would then require some mechanism that could generate these universes, a common cause responsible for all the universes. However, that universe-driving mechanism would need to be further fine-tuned to do so, which just moves the issue one step further, it doesn't actually solve the problem.

Notice the irony with the multiverse objection: in order to avoid considering God, people have proposed other universes, something we can't see, can't touch, can't examine or prove scientifically. But it's precisely these qualities that have been incorrectly used to argue against God. And yet we can know about God, we can see his evident existence in our reality. When I look at the mathematical impossibilities of even our existence in this grand universe, I don't see an unintentional cosmic coincidence, I see the signature of God.

There is no known naturalistic explanation for the stupendous fine-tuning of the universe, nature has no cause capable of explaining it and so does not account for it. So following the evidence where it leads, this would lead us to believe that the fine-tuning of the universe is driven by a cause transcending our natural world. This is, after all, the understanding of a miracle: an intervention into nature by a greater power. In this case, using our cause-and-effect experience of reality, we understand that 'greater power' best resembles a greater intelligence. But we have another miracle to contend with.

The miracle of life

Although we have a universe which is life-permitting, this still does not explain why life has actually come into existence as it has. You can set the table but that doesn't mean food will appear on your plate.

For example, the laws of nature reveal how a universe will behave under given conditions, but those laws do nothing to create anything or cause any event. Just like how the law of arithmetic tells me that if I put £1 in a jar every day of the week, at the end of the first week I will have £7. But if I don't put money into the jar, the math certainly won't do it for me. In a similar way, the fine-tuned universe allows for life to exist, but it does nothing to actually create life, it simply makes it possible. The creative aspect is a separate matter.

Now it turns out that the existence of life is highly improbable. For example, Sir Fred Hoyle the British astronomer, calculated the odds that all the functional proteins necessary for life forming by natural processes, to create a spontaneous cell is less than 1 in 10 to the 40,000th power. Even prior to this, physicist Paul Davies and astrophysicist Hugh Ross used the following analogy to describe the unlikelihood of a planet being suitable for the formation of life: cover America with coins in columns reaching to the moon then multiply that stack by a billion. Then paint one coin red, put it in the pile and ask a blind person to try to pick it out at random. They have the same likelihood of finding the red coin on the first try as any one planet in the universe is to.

You take into consideration the numerous improbable events that must first occur for life to actually form in this tuned universe, and according to the current laws of mathematics, our existence is practically impossible. The existence of life could not have just happened, physical necessity and chance are not good enough explanations, no matter how much time is available. But this doesn't mean we are clueless on the matter. Consider this illustration:

Say you're outside and you look down and find a watch, and you enquire how the watch came to be. You pick it up, take it apart and you're intrigued by all the mechanics, the coiled springs, the balances, the tiny wheels and interworking instruments. You'd see that these many complex and interdependent parts have been put together for a purpose, that they were formed and adjusted to move together to tell you the time of day.

What would you conclude? Logically you'd assume that the watch must have had a maker, that someone must have formed it for the purpose that it achieves. Yet this logical conclusion would not be weakened if you had never seen the watch being made, never met a watchmaker nor knew how to

make a watch. All the time we use technology and marvel at historical arts which we know are the result of some intelligence even without seeing them made or knowing how to make them.

Your conclusion about the watch would still stand even if it stopped functioning properly. It would also still stand even if you saw that some of the parts in the mechanism didn't seem to serve any purpose, as this wouldn't diminish the clearly purposeful design of other parts or its overall functioning.

What's more, your first conclusion about the watch probably wouldn't be that the atoms that make it up had accidentally fallen in the form you find them. But that's pretty much how we see life. And so the point is that if we know there's a watchmaker when we find a watch, something far more complex and wonderful should point us to an even greater designer. Now if life came to exist against all natural odds, shouldn't we attribute an intelligent designer to life? Even more so if we find that the simplest life form far exceeds the complexity, precision, design, order and magnitude of a watch.

Facing facts

The universe does not explain its fine-tuning. Our universe contains various constants and certain arbitrary physical quantities that are not determined by the laws of nature but, as far as science is concerned, are brute facts that are just there. These factors are in principle incapable of being explained by nature, and therefore also science, because they are ultimate - givens plugged into scientific laws (the laws of nature) and so set prior to nature, since nature is run according to them. This means that the incredible, practically impossible precision of the entire natural world to allow for life cannot be explained by this natural world.

What's more, nature also does not account for the existence and improbability of life, in fact, nature points against it. No matter how much time you allow, this can't just be an unintentional cosmic coincidence that simply happened through blind force of nature. The probabilities are too stark for that to be plausible. Naturalism *fails* as an explanation.

The fine tuning of the universe and the miraculous event of life appear to be ordained prior to nature. Where nature provides no explanation, we see the signs of a miracle.

I will finish with the words of Paul the apostle, taken from his letter to the church in Rome: "*For since the creation of the world God's invisible qualities - his eternal power and divine nature - have been clearly seen, being understood from what has been made, so that people are without excuse.*"