Tapescript

The Multiverse and Life on Other Planets **(Interview with Brian Cox)**

(BC=Brian Cox)

BC: What does it mean to live a finite, fragile life in an infinite, eternal universe? And I think the answer is that... So, paradoxically, whilst we are definitely physically insignificant, I've just said, you know, that the Earth is one planet around one star amongst 400 billion stars in one galaxy, amongst two trillion galaxies in a small patch of the universe, right?

So, we're definitely small, and you can't argue with that; we're just specks of dust. But if you think about what we are, so everybody, me and you, everybody, we're just collections of atoms, right? Some of them are as old as time, pretty much, and some of them, the other ones, everything else other than the hydrogen in our bodies, was made in stars, right? So, we were cooked over billions of years. And we're in this pattern that can think.

So suddenly, as the great Carl Sagan said, "You have a means by which the universe understands and explores itself," which is us. And that sounds unlikely when you put it like that, that you can have a few things that were cooked in the hearts of stars. You stick them together in a pattern and suddenly it has some ideas and starts writing music and arts and things. That's quite difficult to comprehend, right? But that happened here, we know that, because we're sitting here having a conversation.

And so, the question then becomes, well, on how many other worlds did that happen? And that's where I think the value can come in because it's a reasonable guess and it is just a guess, right? But it's reasonable. You can make the argument that there aren't any other worlds where this happened, certainly in our galaxy. So it could be that this planet, notwithstanding its physical insignificance, is the only place where anything thinks, right? For millions of light years in every direction. But suddenly, therefore, you end up considering this planet as being the most valuable place in the local universe, notwithstanding the fact that it's small.

And that idea, it's not just a complete random guess, by the way, we've had a bit of a look. Astronomers have pointed radio telescopes up at the stars for a while, 50 years or more now, and heard nothing. We've seen no evidence of any civilizations out there beyond Earth, and that's a surprise.

There's a reasonably plausible explanation for that, which is biology. Which is that if you look at the history of life on Earth, then you see that life began pretty much as soon as it could here on Earth. We have evidence there was life 3.8 billion years ago, something like that, and the Earth's four and a half billion years old. So, pretty quick in geological time, you get life. But then if you talk about advanced life, complex life, multicellular life, then there's no evidence at all back beyond a billion years, actually. In the fossil record, 650 million years ago or something, you start seeing the first evidence of complex creatures.

So that means that on this planet, it took over three billion years to go from single-cell life to anything more complex than a single cell. And then another half a billion years or so to go from the multicellular things to a civilization. So, it's three-and-a-half to four billion years; it's a third of the age of the universe. That is a really long time. If you say, that's an unbroken chain of life on a little piece of rock in a violent universe and that chain was not cut for four billion years in order to get us. And that might be a big ask, right?

We live in a really violent universe. You look at the Milky Way and you look at that arc of stars across the sky, 400 billion suns, all there will be up there at best is slime. It's just slime. Nothing. Right? And I think that's a reasonable guess. That's where I start from. I mean, I wouldn't be surprised if that's wrong, then you go, okay, good. Well, fine. But at the moment it looks like there isn't anything else other than slime. We haven't even discovered slime, by the way, yet. We're still in the position where we've not seen anything, not even a single cell on Mars or, you know, the moons of Jupiter or somewhere like that. So, at the moment, we are alone, as far as we can tell.