

CHAPTER 7

AN ANCIENT AND DYNAMIC UNIVERSE

DOES THE SCIENTIFIC EVIDENCE OF FINE TUNING PROVE THE EXISTENCE OF GOD?

Intelligent Design theory focuses on two particular arguments. One argument is that the fundamental laws of physics and the basic parameters of the universe seem to be *finely tuned* for life to exist. The second argument is that biological life is irreducibly complex, too complex to have evolved, so that an intelligent being must have intervened in some way during the history of life on earth in order to make life more complex. While the biological complexity argument is what generates most of the scientific controversy and court battles over evolution, the fine-tuning argument deserves our attention.

The scientific evidence for fine tuning certainly affirms the Christian faith in a designer God, and it is compelling evidence that can draw an unbeliever to faith in God. But can it *prove* the existence of God? Fine tuning only works as a proof of God's existence if no other possible explanations are offered.

An alternate explanation proposed by John Barrow and Frank Tipler is called the *Weak Anthropic Principle*. The Weak Anthropic Principle states that we should not be surprised that the universe appears fine tuned to support life. Consider the alternative: if the universe did not have the necessary properties to support intelligent life, then we wouldn't be here to ask the question! The simple fact that we exist means that we will necessarily observe a universe that can support life.

While this argument is enough to satisfy some people, others argue that the Weak Anthropic Principle doesn't really explain fine tuning. The Weak Anthropic Principle would be true whether the conditions necessary to support life are typical of universes or extremely rare in universes. Fine tuning tells us that, if the laws of physics in any universe were chosen randomly, then it would be extremely rare that a universe could support life. This extreme rarity seems to require explanation.

Philosopher John Leslie uses a "firing squad" analogy to explain this rarity ("How to Draw Conclusions From a Fine-Tuned Cosmos," *Physics, Philosophy, and Theology: A Common Quest for Understanding*; Robert Russell et al., editors; Vatican Observatory Press, 1988). Imagine a prisoner is taken out to be executed, and fifty sharpshooters aim at him from short range. The odds of any one of them missing the prisoner is very small. They all fire, and yet they all miss the prisoner and he survives! Would the prisoner say afterwards, "Oh, that's not significant. No explanation needed. If they hadn't all missed, I wouldn't be alive here to consider it." No, he would look for a reason why all the shooters missed. In the same way, the simple fact that we're here doesn't explain why the universe is the way it is. The fact that the laws are fine tuned for the particular conditions necessary for life begs for a deeper explanation.

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Some scientists are looking for scientific explanations for fine tuning. The most common idea these days is the *multiverse*. What if our universe was one of many universes? Perhaps a *mother universe* produced many different big bangs, or more plausibly, our Big Bang produced a multiverse with many separate regions. We live in just one of them. The key idea is that all the different regions have different values for the physical constants (force strengths, particle masses, cosmological expansion rate, and so on). Of the many regions in the multiverse only a few—or perhaps just one—will happen to have the exact physical constants that are appropriate for life; all the rest will be lifeless. Then, based on the Weak Anthropic Principle, we can conclude that we must be living in the one region appropriate for life. The multiverse hypothesis turns the fine-tuning argument upside down. If many regions, each with its own laws, exist in the universe, then our own region no longer looks fine tuned; it just looks like home. Looking at our universe is like going shopping for clothes; if the racks are empty except for one shirt, it would be very surprising to find that the one shirt fits you perfectly. But if the store carries many shirts with a wide range of sizes, it is not surprising at all to find one that fits you. (This example is borrowed from astronomer Sir Martin Rees.)

Scientifically, the idea of a mother universe that can create other big bangs is mostly speculation at this point, but in future years it might develop into a testable theory. The idea that our Big Bang produced a universe with multiple regions, each with its own laws of physics, has more scientific basis. (It's called the theory of Inflation, and recent observations of the Cosmic Microwave Background have confirmed some of its predictions.) But even the theory of Inflation needs more scientific work (several competing versions exist now), and it will be difficult to confirm the prediction of a multiverse with observations. More important, it won't explain all of the fine tuning. The Big Bang, even if it created multiple regions of the universe each with its own physical laws, would itself need to be carefully fine tuned in order to produce multiple regions, to give those regions a range of physical properties, and to have that range include the values appropriate for life. Inflation reduces the need for divine fine-tuning but does not eliminate it.