

abnormalities in known laws are usually accounted for by even deeper and more beautiful laws that seem to underlie the workings of nature.

This is what biologist Ursula Goodenough has called "the sacred depths of nature," and even nonreligious scientists are awed by this idea. Here, I believe, is where many believers and nonbelievers can find common ground: in their shared reverence for the grandeur of creation.

Yet the mind that reflects on nature's intricate order is irresistibly propelled to ask how this order came to be. Why is a reality structured in this way? Doesn't a lawful order of nature require some ultimate explanation? If it does, then clearly the best explanation for why the universe is so orderly and intelligible and favorable for life is that an intelligent being made it that way.

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A Designer Universe

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It is a core belief of the world's major religions — and specifically Judaism, Christianity and Islam — that man occupies a privileged place in God's creation. In their view, the universe was made with us in mind — or even for our sake. How can be in these traditional beliefs be reconciled with the discovery that we live in a vast universe with innumerable other planets, and galaxies, and hundreds of billions of stars, some of them so far away that they have completely burned out by the time their light reaches Earth?

In recent years, physics has given this question a resounding answer that affirms man's special place in the cosmos. It turns out that the vast size and great age of our universe are not coincidental. They are the indispensable conditions for the existence of life on Earth. In other words, the universe has to be just as big as it is and just as old as it is in order to contain living inhabitants like you and me. The entire universe, with all its flaws, appears to be a conspiracy to produce the human race. Physicists call this incredible finding the "anthropic principle."

FINE-TUNED FOR LIFE

Physicists stumbled upon the anthropic principle by asking a simple question: Why does the universe operate according to the laws it does? They arrived at a remarkable conclusion. In order for life to exist — in order

for humanity to exist — the gravitational force has to be precisely what it is. The Big Bang had to occur exactly when it did. If the basic values and relationships of nature were even slightly different, our universe would not exist, and neither would we. Fantastic though it seems, the universe is fine-tuned for human habitation. We live in a kind of Goldilocks universe in which the conditions are "just right" for life to emerge and thrive. As physicist Paul Davies puts it, "We have been written into the laws of nature in the deep and, I believe, meaningful way."

Physicist Stephen Hawking gives a telling example: "If the rate of expansion one second after the Big Bang had been smaller by even one part in a hundred thousand million million, the universe would have recollapsed before it even reached its present size." So the odds against us being here are, well, astronomical. And yet we are here. Who is responsible for this?

Leading scientists have acknowledged the far-reaching implications of the anthropic principle. "A commonsense interpretation of the facts," writes astronomer Fred Hoyle, "suggest that a super-intellect has monkeyed with the laws of physics." Physicist Freeman Dyson says, "The more I examine the universe and study the details of its architecture, the more evidence I find that the universe in some sense must have known we were coming."

WE ARE NO ACCIDENT

As you might expect, the anthropic principle has provoked a huge debate and a strong reaction. Astronomer Robert Jastrow observes

that the anthropic principle "is the most theistic result ever to come out of science." Yet atheistic scientists and pundits typically attribute the fine-tuning of the universe to incredible coincidence. The physicist Victor Stenger, in his book *Not by design*, writes, "The universe is an accident."

An accident? The physicist Steven Weinberg and biologist Richard Dawkins are not impressed by the improbability of this explanation. According to Weinberg, "You don't have to invoke a benevolent designer to explain why we are in one of the parts of the universe where life is possible: In all the other parts of the universe there is no one to raise the question." Dawkins concurs; "It is no accident that our kind of life finds itself on a planet whose temperature, rainfall and everything else are exactly right. If the planets were suitable for another kind of life, it is that kind of life that would have evolved here." In science, this is called a "selection effect." Since we are here, we know that — whatever the odds — a game of cosmic chance must have worked in our favor.

There is a problem with this reasoning that I would like to dramatize by giving an example from the philosopher John Leslie. Imagine a man sentenced to death, standing before a firing squad. The shooters discharge their rifles. Somehow they all miss. They shoot again, and again fail to hit their target. Repeatedly, they fire and repeatedly they miss. Later the prisoner is approached by the warden who says, "I can't believe they all missed. Clearly there is some sort of conspiracy at work." Yet the prisoner laughs and says, "What on earth would make

you could suggest a conspiracy? It's no big deal. Obviously the marksmen missed because if they had not missed I would not be here to have this discussion." Such a prisoner would immediately, and rightly, be transferred to the mental ward.

Simply put, you cannot explain in the improbability of this magnitude by simply pointing to our presence on the scene to ponder it. You must still account for the massive improbability. Remember that the anthropic principle does not say that, given the billions of stars in the universe, it is remarkable that life turned up on our planet. Rather, it says that the entire universe with all the galaxies and stars in it had to be formed in a certain way in order for it to contain life at all.

THE DEPTHS OF NATURE

The atheist viewpoint is not only unable to explain the fine-tuning of nature, it cannot explain the profound lawfulness of nature itself. Davies writes, "if the divine underpinning of the laws is removed, their existence becomes a profound mystery. Where do they come from? Who sent the message? Who devised the code?"

Indeed the question can be posed in a deeper way: How can inanimate objects like electrons follow laws? Our experience as humans is that only rational and conscious agents can obey instructions. It remains deeply mysterious how atoms and molecules can do anything whatsoever, let alone abide by mathematical rules. And what rules! Throughout the history of science, its practitioners have found that