

## Why Does the Universe Work?



HOWARD VAN TILL

Can the “stuff” of the universe do everything that science expects of it? The world of whirling particles can do a lot, but does it have the abilities needed for transforming raw energy into atoms, and atoms into elephants, and us?

As scientists, we think it does. But, also as scientists, we haven’t a clue as to why that should be the case. Why should the universe work well enough to make the processes of evolution possible? We have no scientific answer. Science is silent here.

Some people I know take this silence as evidence that divine intrusion was needed. The “God of special effects” often gets plugged in wherever there are gaps in today’s scientific knowledge. Gaps in what we know are treated as if they were gaps in what the universe can do. Some people say, for instance, that God has had to intervene from time to time to start new forms of life.

But what if such interventions are not necessary? That would raise an even more interesting question, wouldn’t it? How did the universe come to possess the abilities for organizing atoms into elephants? Science crafts clever theories about how things get formed, but why is the stuff of the universe able to arrange itself into these forms?

Why, for instance, should protons and neutrons be able to combine into the nuclei of a hundred different chemical elements? And why should the atoms of these elements be inclined to gather into molecules—from simple molecules like carbon dioxide to complex coils of DNA molecules essential for life? It would be so easy to imagine a universe with elementary constituents that did not have these gifts for forming things.

Questions of this sort are seldom asked in a typical science course. Having taught physics for many years, I know the usual routine. We tell

students about the basic forces of interaction. We write down the “laws of physics” that provide us with a cause-and-effect story for what happens when things interact. That should settle it, right?

Perhaps. But it depends on what needs to be settled. If the question were simply, What happens when things interact? then the standard textbook approach would be adequate. But I want to ask a more profound question. I want to know why there are such things as interaction forces in the first place, and why things are gifted with the ability to respond to these forces in the particular ways that we observe.

In short, why does the universe work? Where do the universe’s “natural” abilities come from? What is the ultimate source of the properties and interactions that we take for granted as ordinary? What we call “ordinary” turns out to be truly awesome when you think about it. I want to know where the universe gets its awesome character.

Science has no answers to questions like this. We scientists do a bang-up job of figuring out how things work. We’ve learned how to connect what happens to what abilities are being exercised. But when we ask why the universe should possess these particular abilities, we are forced to think about the ultimate Source of the universe’s being. We must ask why there is something rather than nothing. And why is the something that exists (this universe) so well equipped with the abilities—the gifts—for organizing into new forms?

Ask a dozen people this question. See how differently they respond. Some will be content with glib appeals to chance or luck. Others will assert that the question has no answer and will suggest that you move on to more practical issues. Most would rather know the closing figures of the stock market.

But some of us still wonder at the giftedness of the universe. Is a facile

appeal to happenstance enough? Or could it be that the universe is a creation? Could it be that the universe has been gifted by its Creator with all of the abilities needed to bring about new forms in time?

Suppose that the universe really is a creation. Then everything that the universe is and is able to do would have to be seen as a “gift of being” from the Creator. Furthermore, the more gifted the universe is, the more it owes to the creativity and generosity of the Creator. This sort of Creator cannot be confined to gaps carved by human ignorance.

There was a time when there were no living creatures of any sort on our planet. Oh, there may have been globs of biologically interesting molecules around, but they were not yet organized into living systems. But now there are lots of living things walking, swimming, crawling, and flying around. How did that astounding change come about?

If our scientific hunches are on the right track—and I do think they are—some of those interesting molecules had the abilities to self-organize into primitive forms of life. And those primitive organisms must also have had the gifts for diversifying into a vast array of novel forms in time.

Do these awesome gifts come spontaneously from nothing? I doubt it. Perhaps the awesome nature of the universe is best seen as evidence for a Mind more creative than we could imagine. Perhaps the giftedness of the universe is best seen as evidence for a Giver of Being more generous than we humans could ever envision.

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