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April 25, 2015: Is Matter Enough? But What is Matter?

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Dyson concentrates on politics and what he calls Einstein's philosophy, by which he means "a general view of nature."

It is here that the usual disagreement between believers and nonbelievers (in orthodox religion) comes into play. Atheists and their fellow travelers like to say that we follow reason and evidence. It is a silly claim—like believers saying that they are good, I guess—but it is also incomprehensible, as Dyson shows. We have no idea what nature is like.

According to Dyson, Einstein's general view of reality "describes nature as a single layer of observable objects with strict causality governing their movements. If the state of affairs at the present time is precisely known, then the laws of nature allow the state at a future time to be precisely predicted. The uncertainty of our knowledge of the future arises only from the uncertainty of our knowledge of the past and present. I call this view of nature the classical philosophy, since all objects obey the laws of classical physics."

Einstein's view is that of most of the nonaffiliated. But ten years after Einstein worked this out, Niels Bohr, looking at quantum mechanics as understood by Werner Heisenberg and Erwin Schrodinger, described "the universe as consisting of two layers. The first layer is the classical world of Einstein, with objects that are directly observable but no longer predictable. They have become unpredictable because they are driven by events in the second layer that we cannot see. The second layer is the quantum world, with states that are not directly observable but obey simple laws. For example, the laws of the second layer decree that every particle travels along every possible path with a probability that depends in a simple way on the path." The two layers are connected by "probabilistic rules." The future in the first layer is in principle uncertain.

Bohr's understanding dominated the twentieth century and led to new sciences dominated by mathematical symmetries at the quantum level that were only approximate for the world we know. Both layers are real, but we don't understand their connection.

Today, however, a new generation of scientists reject Bohr's dualism. According to Dyson, these new scientists believe that only the quantum world exists and the classical world is an illusion brought about by a process called decoherence that erases many quantum effects.

Then Dyson gives this summary: "there are three ways to understand philosophically our observations of the physical universe. The classical philosophy of Einstein has everything in a single layer obeying classical laws, with quantum processes unexplained. The quantum-only philosophy has included everything in a single layer obeying quantum laws, with the astonishing solidity and uniqueness of the classical illusion unexplained. The dualistic philosophy gives reality impartially to the classical vision of Einstein and to the quantum vision of Bohr, with the details of the connection between the two layers unexplained. All three philosophies are tenable, and all three are incomplete. I prefer the dualistic philosophy because I give equal weight to the insights of Einstein and Bohr. I do not believe that the celestial harmonies discovered by Einstein are an accidental illusion."

Now this is a physicist writing, a Professor of Physics Emeritus at the Institute for Advanced Study in Princeton. So, I'm sure this account of our situation is accurate.

Most atheists know nothing of quantum theory. In a vague way, they assume Einstein's view. They can't be dualists because that would allow both this world and another world to be real, which would smell religious to them.

But that means, from the perspective of many scientists, atheists believe in an illusion—rather comically, precisely what they accuse religious people of believing.