

## Vital Dust: Life as a Cosmic Imperative

**Christian de Duve**

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The view of the origin of life as a kind of cosmic accident — a “one-off” event, in British parlance — has achieved wide currency within evolutionary thinking. Perhaps its ablest spokesman was Jacques Monod, who wrote in *Chance and Necessity*:

*Life appeared on earth: what, before the event, were the chances that this would occur? ...[I]ts a priori probability was virtually zero. The idea is distasteful to most scientists.*

Among those who find the idea of life as a cosmic fluke distasteful is the Belgian cell biologist and Nobel laureate Christian de Duve. The argument, he observes in his new book *Vital Dust*, put the origin of life outside the reach of science:

*If this were so, we would be wasting our time trying to explain the origin of life in scientific terms. A number of eminent scholars have made this claim. Some have even pushed it to its logical conclusion, that if life is a highly improbable product of chance, it has no place in any*

*sort of cosmological view we may entertain.... Its emergence was a "lusus naturae," a cosmic joke. In the words of the late Jacques Monod, one of the greatest French biologists: "The universe was not pregnant with life." This statement has profound philosophical implications (p. 8).*

De Duve is himself a determinist about the origin of life and its subsequent evolution. While allowing that contingency will play a role in any evolutionary sequence, de Duve sees the universe as “a hotbed of life” (p. 292), where the emergence of organisms is almost certain to occur once conditions are right — as, he argues, they often must be:

*In this organic cloud [of carbon compounds], which pervades the universe, life is almost bound to arise, in a molecular form not very different from its form on Earth, wherever physical conditions are similar to those that prevailed on our planet some four billion years ago. The conclusion seems to me almost inescapable. Those who claim that life is a highly improbable event, possibly unique, have not looked closely enough at the chemical realities underlying the origin of life. Life*

*is either a reproducible, almost commonplace manifestation of matter, given certain conditions, or a miracle. Too many steps are involved to allow for something in between. (p. 292)*

In *Vital Dust*, de Duve spells out in seven parts his “deterministic” case for the evolution of life, complex organisms, and, eventually, intelligence. Scientists, he writes, “are condemned by their calling to look for natural explanations of even the most unnatural-looking events,” and what counts as an explanation is *not* “the facile recourse to chance” (p. 24).

Thus, parts I to III are de Duve’s argument for the relative *ease* of prebiotic and “protocell” evolution, parts IV to VI from the single cell to human intelligence, and part VII, evolution into the unknown (including, in a philosophical coda, the meaning of life).

While *Vital Dust* is engagingly written, it falls far short of showing that Monod was wrong — or, perhaps, that design theorists such as Charles Thaxton are wrong, when they argue that known physical and chemical regularities are insufficient to account for the specified complexity of even the simplest organisms. In particular, de Duve’s scenario for the origin of life, in which “protometabolism” produces the materials necessary for the RNA world of the first self-replicating molecules, is, he admits, “purely conjectural” (p. 45). Hence, the reader is left with a sense of grand claims for determinism which cannot be sustained by empirical particulars. Sure, it’s easy to build the Pyramids of Giza. Just put one brick on top of another, and stop when you’re done. But determinism is, one might say, as determinism does — and de Duve hasn’t done it (that is, show how the origin of life is natural and inevitable, given the right conditions). Rather, he’s written a suggestive appeal for further research, to show how it might be done.