

Evolution and the illusion of randomness¹

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Zusammenfassung

Die meisten von uns haben in der Schule gelernt, dass alle Schönheit, Weisheit und Vielfalt des Lebens Ergebnis von zwei Triebkräften seien: zufällige Variation (Mutation) und Selektion der bestangepassten Organismen. Heute wissen wir, dass Mutationen generell keineswegs zufällig sind – das wird durch neue molekularbiologische Entdeckungen laufend bestätigt. Nach wie vor hält sich allerdings in der aktuellen Evolutionstheorie die These, dass Mutationen zumindest in einer Hinsicht zufällig sein müssen, nämlich in Bezug auf Fitness; das heisst, die Wahrscheinlichkeit einer Mutation muss unabhängig sein von ihrer Nützlichkeit für das Lebewesen. Diese Annahme führt den Evolutionsbiologen Richard Dawkins und den Philosophen Daniel Dennett dazu, Evolution als blinden, geist- oder sinnlosen, ziel- und bedeutungslosen Prozess zu verstehen. Im Gegensatz dazu zeigt die aktuelle Literatur eindrucklich, dass Mutationsereignisse in die hochkomplexen Lebensvorgänge von Zelle und Organismus in grossem Ausmass eingebettet sind, so sehr, dass einige Wissenschaftler sogar von «natürlicher Gentechnik» sprechen. Zudem ist man sich weitgehend einig, dass das Konzept der besten Anpassung oder Fitness, an dem sich Biologen und Philosophen seit Jahrzehnten die Zähne ausbeissen, hoffnungslos unklar ist. Die Behauptung, Evolution sei ohne Sinn und Bedeutung, gründet daher auf einer nicht zu haltenden Annahme: dass Mutationen, zumindest im Blick auf Fitness zufällig sein sollen – wie gezeigt wird, sind sie es nicht; zudem kann mit dem Konzept Fitness kein schlüssiger und allgemein akzeptierter Sinngehalt verbunden werden.

Summary

Most of us learned in school that all the beauty, embodied wisdom, and diversity of life on earth have resulted from two driving forces: random variation (genetic mutation) and selection of the fittest organisms. It is recognized today that mutations are, in general, far from random — and are appearing less so with almost every new discovery at the molecular level. But there remains one crucial respect, foundational to current evolutionary theory, in which mutations must continue to be deemed random: they must be random with respect to fitness. In other words, the likelihood of a mutation must be independent of its usefulness to the organism. This assumption underlies remarks by evolutionist Richard Dawkins and philosopher Daniel Dennett to the effect that evolution is an essentially blind, mindless, purposeless, and

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meaningless process. Yet the current literature powerfully testifies to the fact that (1) mutational processes in general participate in the highly organized and coordinated life processes of the cell and organism — so much so that some researchers now refer to “natural genetic engineering”; and (2) the idea of fitness, which biologists and philosophers have struggled with for decades, remains hopelessly obscure, and its obscurity is widely acknowledged. The claim of meaninglessness is therefore grounded in the wholly unsupported notion that mutations — which in general do not happen blindly at all, but are part of coherent life processes — are random at least when considered relative to a concept (fitness) that cannot be given any coherent or agreed-upon meaning.

Most biologists, I suspect, will happily own up to the fact that they think of the organism as engaged in strikingly directed and meaningful activity. The lion stalking the gazelle, the bird building a nest, the larva spinning a cocoon, the rose flowering, the cell dividing and differentiating, the organism maintaining its own way of being amid the perturbations of its environment — they all reflect a kind of intentional pursuit we would never attribute to dust, rocks, ocean waves, or clouds.

Biologists, that is, will acknowledge that, at molecular and higher levels, they see almost nothing but an effective employment of a thousand interwoven means to achieve a thousand interwoven ends — all in an almost incomprehensibly organized, coordinated, and integrated fashion expressing the striving of the organism as a whole. The organism, they will say, as it develops from embryo to adult — as it socializes, eats, plays, fights, heals its wounds, communicates, and reproduces — is the most concertedly purposeful entity we could possibly imagine. It does not merely exist in accord with the laws of physics and chemistry; rather, it is telling the meaningful story of its own life.

And then they will take it all back.

In other words, the routine language of biological description, highlighted in the earlier parts² of this series, is fully accepted, only to be effectively disowned. The explanation for this remarkable intellectual flexibility lies in a widespread view that runs as follows. Evolution produces organisms that we cannot help describing as purposeful and meaningful agents. That’s because natural selection tends to select organisms that are *fit* — well-adapted to their environments and “designed” for surviving. When organisms have features that are adapted *for* something, we naturally see these features as meaningful and purposeful. And an organism compounded of such features

2 <http://natureinstitute.org/txt/st/mqual/index.htm#genome>