

The Gorbachev of Darwinism

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Stephen Jay Gould is mad as hell, and he's not going to take it any more. Readers of the *New York Review of Books* learned that much in June 1997, when they read a lengthy, two-part tirade in which Gould attempted to settle scores with some of his more prominent enemies within the guild of Darwinists. The targets were Daniel Dennett, John Maynard Smith, Robert Wright, and especially, although largely in the background, Richard Dawkins. One cannot understand the controversy without sampling the level of vitriol, which may be judged by this salvo from Gould:

[Dennett's] limited and superficial book reads like a caricature of a caricature—for if Richard Dawkins has trivialized Darwin's richness by adhering to the strictest form of adaptationist argument in a maximally reductionist mode, then Dennett, as Dawkins' publicist, manages to convert an already vitiated and improbable account into an even more simplistic and uncompromising doctrine. If history, as often noted, replays grandeurs as farces, and if T. H. Huxley truly acted as "Darwin's bulldog," then it is hard to resist thinking of Dennett, in this book, as "Dawkins' lapdog."

After going on in that vein for some pages, Gould responded with hurt feelings to Maynard Smith's published comment that "the evolutionary biologists with whom I have discussed [Gould's] work tend to see him as a man whose ideas are so confused as to be hardly worth bothering with, but as one who should not be publicly criticized because he is at least on our side against the creationists." To this Gould lamented that Maynard Smith used to say much nicer things about him and warned that "We will not win this most important of all battles [against the creationists] if we descend to the same tactics of backbiting and anathematization that characterize our true opponents." Tell that to Dawkins' lapdog.

Gould's decision to publish an all-out blast at the writers whom he calls "Darwinian Fundamentalists" escalated what his colleague Niles Eldredge has called the "high-table debate" among evolutionists. This is basically a struggle between the classical neo-Darwinists (represented most prominently by Dawkins) and the revisionists (headed by Gould himself), who follow the tradition of T. H. Huxley by advocating "evolution" while remaining cool towards Darwin's distinctive mechanism. It's a debate that has long been muted because of the mutual desire of the adversaries to avoid giving ammunition to the despised creationists, and even now

the arguments are conducted in an obscure jargon worthy of *Pravda* in its heyday. But here's what it's all about.

In the early 1980s the British geneticist J. R. G. Turner remarked, with specific reference to the controversies swirling around Gould, that "Evolutionary biologists are all Darwinists, as all Christians follow Christ and all Communists, Karl Marx. The schisms are over which parts of the Master's teaching shall be seen as central." The canonical text for fans of natural selection is Darwin's eloquent statement in *The Origin of Species* that "natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life." Note the key elements: natural selection everywhere and at all times accepts or rejects all variations, however slight, and continually promotes the "improvement" of all organisms. Evolution of that kind, in the jargon of the trade, is called pan-selectionism.

The revisionist Gould calls that picture of ubiquitous selection "ultra-Darwinism" or "Darwinian fundamentalism," and he attributes it not to Darwin himself but to contemporary Darwinists like Dawkins and Dennett. Gould ignores Darwin's own pan-selectionist affirmations and quotes instead a passage from the sixth and final (1872) edition of the *Origin*. There Darwin remarked with some bitterness that critics had, by "steady misrepresentation," overlooked his qualification that "natural selection has been the main *but not the exclusive* means of modification" (emphasis added). Whether the qualification amounts to much is hard to say, since a few exceptions to an otherwise pervasive pattern of selectionism would be consistent with the modest disclaimer that natural selection is not literally "exclusive."

In any event, Gould accuses the ultra-Darwinists of preaching that "natural selection regulates everything of any importance in evolution, and that adaptation emerges as a universal result and ultimate test of selection's ubiquity." Against this fundamentalism Gould asserts his own "pluralism," which includes at least four non-adaptationist claims about evolution: (1) neutral genetic changes are a major aspect of evolution; (2) basic developmental pathways are highly conserved across otherwise disparate groups and hence impose constraints on adaptive change; (3) species remain unchanged for long periods and then branch apart in "geological moments" (a process Gould calls "punctuated equilibrium"); and (4) many or most extinctions have been due to catastrophic events rather than (as Darwin insisted) the gradual operation of ordinary selective pressures.

That's where the name-calling starts, because the classical Darwinists consider Gould's description of their position to be a preposterous caricature. Gould has a well-earned reputation for distorting the views of his rivals and adversaries, and it is not surprising to find that the complaints are justified. To my knowledge none of his targets disputes that neutral variations occur in plenty, that developmental pathways are conserved, that significant evolutionary change may occur in brief periods of time (geologically speaking) after longer periods of stasis, or that the dinosaurs were probably wiped out by a planetary catastrophe. Gould does deserve credit for advocating these sub-theories before they became popular, but nowadays everybody claims to be a pluralist.

For his own part, Gould does not deny the central tenet of the classicists—that adaptive complexity is due to the Darwinian mechanism of natural selection. In his own words, "Yes, eyes are for seeing and feet are for moving. And, yes again, I know of no scientific mechanism other than natural selection with the proven power to build structures of such eminently workable design." The creative power of natural selection is actually inferred from materialist philosophy, rather than proved by scientific evidence, but let that pass. If both sides agree that natural selection is responsible for adaptation, and also that natural selection isn't the whole story of evolution, then where is their disagreement? It is little wonder that many observers have concluded that there is no substance behind this food fight at the high table, but only a clash of overgrown egos.

In fact, however, the disagreement is substantive. The key to understanding it is to recognize that being a true Darwinist requires more than just giving lip service to natural selection before going on to something else, which is what Gould typically does. If natural selection actually made all those marvels of biological complexity, certain conclusions about the pace and manner of evolution necessarily follow, and Gould frequently seems to be denying those necessary conclusions. The dinosaurs can be killed off as rapidly as you like, but all the dinosaurs that died and all the new mammals that replaced them had to have been built up in the first place through the gradual accumulation of random mutations by natural selection. Likewise, the problem with neutral gene substitutions is not that anyone doubts they occur, but that neutral changes by definition do not help with the overwhelming task of building up the complex adaptations. Natural selection had to do that whole job, if God didn't do it, and that means natural selection had to be continuously active across vast stretches of geological time regardless of what the fossil record shows. That implies, among other things, that an enormous amount of evidence of the process has to be missing from the fossil record, but Gould frequently gives the impression that he thinks the evidence was never there.

One of the most notorious examples occurs in Gould's discussion of the Cambrian Explosion in his 1989 book *Wonderful Life*. The "Cambrian Explosion" is the sudden appearance of the major animal groups (phyla) in the rocks of the Cambrian era, without apparent ancestors. As Dawkins himself has put it, "It is as though they were just planted there, without any evolutionary history." Of course, Dawkins and all other Darwinists believe that this appearance is an illusion caused by the incompleteness of the record, and that a complete fossil record would show a universe of transitional forms and side branches, all having evolved by tiny steps from a single common ancestor. Gould raises a radically different possibility. He explains that there are two possible explanations for the absence of Precambrian ancestors: "the artifact theory (they did exist, but the fossil record hasn't preserved them), and the fast-transition theory (they really didn't exist, at least as complex invertebrates easily linked to their descendants)."

That final qualifying clause is a typical example of Gould's penchant for equivocation: *of course* the missing ancestors didn't exist in a form "easily linked to their descendants." That is why there is a problem, and why the artifact theory has to be true if Darwinism is true. Hence when Gould went on to proclaim that new discoveries had sounded "the death knell of the artifact theory," some readers understandably took him to be saying that the phyla really were just planted there without any evolutionary history, which amounts to saying that they were specially

created. Gould assuredly could not have meant that, but then what exactly did he mean? Remember that saving Darwinism in the teeth of the Cambrian evidence requires not just assuming a few missing ancestors, easily linked to their descendants or not, but assuming a vast quantity of vanished transitional forms between the hypothetical single-celled ancestors and the vastly different multicellular invertebrates. If you are a Darwinist you know the necessary ancestors and transitionals had to exist, regardless of the lack of fossil evidence. If you doubt that their absence is an artifact of the fossil record, you are not a Darwinist.

The difficulty of saying whether Gould really is a Darwinist or not stems from his habit of combining radically anti-Darwinian statements with qualifications that preserve a line of retreat. When Gould loudly proclaimed "the return of the hopeful monster," for example, he seemed to be endorsing the geneticist Richard Goldschmidt's view that large mutations create new kinds of organisms in single-generation jumps—a heresy which Darwinists consider to be only a little better than outright creationism. If you read the fine print carefully, however, you'll find that Gould surrounded his claims with qualifications that allow him to insist that he is at least somewhere in the neighborhood of orthodoxy. Even when Gould bluntly announced that neo-Darwinism is "effectively dead," it turns out that he only meant . . . well, nobody seems to know what he meant, but certainly not that neo-Darwinism is effectively dead.

For years Darwinists like Maynard Smith gave Gould the benefit of the doubt, appreciating his genuine flair and his willingness to fight the common enemy. At last they have become thoroughly exasperated with his "now you see it, now you don't" practice of vaguely affirming Darwinism while specifically denying its necessary implications. Gould will only have exacerbated their disgust with his latest outburst.

Gould's uncomfortable situation reminds me of the self-created predicament of Mikhail Gorbachev in the last years of the Soviet Empire. Gorbachev recognized that something had gone wrong with the Communist system, but thought that the system itself could be preserved if it was reformed. His democratic friends warned him that the Marxist fundamentalists would inevitably turn against him, but he was unwilling to endanger his position in the ruling elite by following his own logic to its necessary conclusion. Gould, like Gorbachev, deserves immense credit for bringing glasnost to a closed society of dogmatists. And, like Gorbachev, he lives on as a sad reminder of what happens to those who lack the nerve to make a clean break with a dying theory.

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