

Jerry Fodor: Why Pigs Don't Have Wings · *London Review of Books* · (2007)

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According to Jerry Fodor, many evolutionary biologists believe in *adaptationism*, the idea that (almost) everything can be explained via natural selection. He disagrees, contending that natural selection is “incoherent” and may not be the chief engine of evolution as Darwin believed: “it could turn out that there are indeed baboons in our family tree, but that natural selection isn't how they got there.” He hints at a Fodor-led revolution in biology. In the November 1, 15 and 29 *LRB* issues a number of vexed philosophers and biologists responded and Fodor responded to them. Here is some more on the *nouvelle vague* in evolutionary biology...

Paley Redivivus

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Jerry Fodor (bless him!) once more presents us with a persuasive, entertaining — and profoundly wrong — view of a great man. Not B. F. Skinner this time¹, but a much grander figure, none other than Charles Darwin. Fodor's often misdirected attacks on an extinct behaviorism,² his conclusory dismissal of all non-mentalistic psychology, and his apparent unawareness of the behaviorism that has arisen in place of the old³ are well known. In this article, for example, he sneers at “Skinnerian learning theory,” despite the fact that Skinner explicitly disavowed any such theory.⁴

As for Darwin, Fodor's considerable erudition evidently falls short of a deep acquaintance with one relevant work, *The Origin of Species*, within whose covers will be found answers to all his criticisms of natural selection. Fodor seems to believe a number of myths, all dealt with by Darwin. Here are two:

That natural selection always yields perfect adaptation to the environment (“adaptationism”). Not true: natural selection is always limited by *variation*, the phenotypes offered up by the now-much-better-understood processes of genetics and development: “variation is a slow process, and natural selection can do nothing until favourable individual differences or variations occur.”⁵ Hence many selected-for features will be less than optimal.

And Darwin knew that he understood little or nothing about variation, which need not be random, as Fodor seems to assume: “A grand and almost untrodden field of inquiry will be opened, on the causes and laws of variation, on correlation, on the effects of use and disuse, on the direct action of external conditions, and so forth.”

That traits are independently selected. (Fodor's counterexample is that Lyudmila Trut, breeding for tameness, also produced changes in the ears and coats of her foxes.) Nonsense: Darwin frequently emphasized *correlated variation*, the fact that if you select for a large beak (say), the pigeons will also develop large feet. “Even when selection has been applied by man to some one character alone... it will invariably be found that although this one part ... has been greatly changed, almost all the other parts have been slightly modified. This may be attributed partly to the principle of correlated growth, and partly to so-called spontaneous variation.” The reasons for these correlations, linkage, pleiotropy and developmental constraints, are now well

¹ Fodor, J. (2003) The lemma dilemma. Review of *Thinking without Words* by José Luis Bermúdez Oxford, 225 pp., £25, May, 2003, *London Review of Books*, Wednesday October 22.

² Staddon, J. E. R. (2004) A call to arms. *The Behavior Analyst*, 27, 117-118.

³ Staddon, J. (2001) *The new behaviorism: Mind, mechanism and society*. Philadelphia, PA: Psychology Press. Pp. xiii, 1-211.

⁴ E.g., Skinner, B. F. (1950) Are theories of learning necessary? *Psychological Review*, 57, 193-216.

⁵ All Darwin quotes are from the 6th edition of *The Origin*.

understood in principle, although the details of any particular example may need to be worked out.

And finally there is the bizarre muddle introduced into the intellectual history of evolutionism by Gould and Lewontin's "spandrels" article and perpetuated here by Fodor. Much has been written pointing out the errors of these two notables⁶ and I'm reluctant to add to the canon, but here goes. Fodor writes:

A spandrel is one of those more-or-less triangular spaces that you find at the junctures of the arches that hold up a dome. They are often highly decorated; painters competed in devising designs to fit them. Indeed (and this is Gould and Lewontin's main point), casual inspection might suggest that the spandrels are there because they provide the opportunity for decoration; that, an adaptationist might say, is what spandrels were selected for. But actually, according to Gould and Lewontin, that gets things backwards. In fact, spandrels are a by-product of an arch-and-dome architecture; decide on the latter and you get the former for better or worse. Arches were selected for holding up domes; spandrels just came along for the ride.

It is hard to know how to deal with Gould and Lewontin's argument because it is based on such a deep misunderstanding of how evolution by natural selection must work — "must" in the sense that one can hardly imagine any other way for it to work. Of course the spandrels arose originally for some other reasons, just as the bones of the middle ear were evolved from something selected for functions other than hearing: "The structure that became the sound-conducting middle ear of land animals began as a tube that permitted ancient shallow-water fish to take an occasional breath of air out of the top of their heads..."⁷ So it is with *every* step in evolution, which builds on something earlier, something, perhaps, with quite a different function and perhaps itself not the result of direct selection (see correlated variation, above).

Let us suppose with Fodor that spandrels exist because they support domes. But now, the paintings on the spandrels exist because the spandrels provide a good space to paint. So what! What's the big deal? How on earth does this negate evolution by natural selection?

And finally, the "conceptual problem." Fodor writes:

It's a commonplace that Darwin constructed the theory of natural selection with an eye to what breeders do when they choose which creatures to encourage to reproduce. This reading of Darwin is by no means idiosyncratic. Darwin 'argues by example, not analogy,' Adam Gopnik wrote in the *New Yorker* in October last year. 'The point of the opening of "The Origin" isn't that something similar happens with domesticated breeds and natural species; the point is that the very same thing happens, albeit unplanned and over a much longer period.' It's true, of course, that breeding, like evolution, can alter phenotypes over time, with consequent effects on phylogenetic relations. But, on the face of it, the mechanisms by which breeding and evolution operate could hardly be more different. How could a studied decision to breed for one trait or another be 'the very same thing' as the adventitious culling of a population? Gopnik doesn't say.

Of course, the whole point is that culling by natural selection is far from "adventitious." Wild antelope are not culled at random. The swifter, stronger and smarter are likely to live longer and have more offspring. That's the whole point.

Fodor concludes: "What, then, is the intended interpretation when one speaks of natural selection? The question is wide open as of this writing."

Only in Fodor's mind, I think.⁸

⁶ Gerald Borgia, "The Scandals of San Marco," *Quarterly Review of Biology* 69 (1994): 373-375; J. Maynard Smith, "Confusion over Evolution: An Exchange," *New York Review of Books* (January 14, 1993): 43; D. C. Queller, "The Spaniels of St. Marx and the Panglossian Paradox: A Critique of a Rhetorical Programme," *Quarterly Review of Biology* 70 (1995): 485-490.

⁷ Evolution of Ear Is Noted in Fossil, Transitional Stage of Organ May Have Helped Ancient Fish Breathe. By David Brown, *Washington Post*, Thursday, January 19, 2006; Page A03.

⁸ There is of course a smidgeon of sense in Fodor's misguided account. When a human designer makes something we know what he intended because he can tell us. Nature—Darwinian evolution—has no "intention". It is inferred by us from observation. Thus, we infer that the shape of the herring is "designed," *as if* for low-drag fast swimming,

Postscript

In his final *LRB* riposte (Nov. 29, 2007) to several critics (Blackburn, Coyne, Dennett, Kitcher, Rose, Tudge) Fodor returns to the “incoherence” theme. Apropos the hypothesis that polar bears are selected for being white, he writes:

...they’ve [his critics] somehow left out the Darwin bit. To get it back in, you have to add that the white bears were selected ‘because of’ their improved camouflage, and that the white bears were ‘selected for’ their improved camouflage: i.e. that the improved camouflage ‘explains’ why the white bears survived and flourished. But now we get the incoherence back too. What Darwin failed to notice (and what paradigm adaptationists continue to fail to notice) is that the theory of natural selection entails none of these. In fact, the theory of natural selection leaves it wide open what (if anything) the white bears were selected for. Here’s the argument. Consider any trait *X* that was locally coextensive with being white in the polar bear’s evolutionary ecology. Selection theory is indifferent between ‘the bears were selected for being white’ and ‘the bears were selected for being *X*.’ What’s ‘incoherent’ is to admit that the theory of natural selection can’t distinguish among locally coextensive properties while continuing to claim that natural selection explains why polar bears are white.

Of course, the assertion that polar bears are selected for being white is just a hypothesis. Fodor’s critics point to a number of possible tests (Fodor prefers the term ‘counterfactuals’) that might confirm this hypothesis. But Fodor isn’t interested in empirical test. At the core of his uninterest seems to be a reluctance to admit the legitimacy of any functional explanation that doesn’t involve the explicit intention of some sentient being. When one is offered, as here, Fodor at once objects because it provides an imperfect *causal* account.

I can make the point with a parallel example. Suppose we were to slightly rephrase Fodor’s comment in the following way: “Consider any two genes *X* and *Y* that are both causally related to being white⁹...Selection theory is indifferent between ‘the bears were selected for carrying *X* and ‘the bears were selected for carrying *Y*.’” Well, yes: the selection hypothesis cannot distinguish between the two genetic mechanisms. But genetics alone cannot explain why arctic bears are white and sub-arctic bears are not. A complete scientific account surely requires both.

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of the tiger for prey capture, and so on. But natural selection has no need to “know” in advance what it is selecting for. Discovering the unintentional origins of apparent purpose was Darwin’s great insight.

⁹ Convergent evolution and sibling species show that quite different genotypes may yield very similar phenotypes, so this is not implausible.