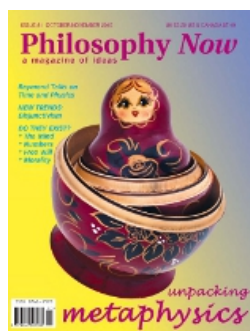


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## Books

# What Darwin Got Wrong by Jerry Fodor and Massimo Piattelli-Palmarini

**Massimo Pigliucci** tells us what Darwin got right.

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The relationship between philosophy and science has always been fraught with mutual incomprehension, as is often the case for parent-offspring relations. Many scientists have come to see philosophy as at best a 'pleasing gloss' on the findings of science, as physicist Steven Weinberg infamously put it. For their part, philosophers are often distrustful of the perceived intrusive cultural colonialism engaged in by some prominent scientists, such as Edward O. Wilson.

Things get even more complicated when it comes to evolution. The field has of course been controversial since Darwin, and it still is in many parts of the world – particularly in the United States, where the evolution-creation cultural wars are as American as Coca Cola and cheeseburgers.

Philosophers have sometimes displayed what scientists justly regard as a maddening attitude toward evolution. For instance, Karl Popper famously regarded the theory of natural selection as a 'metaphysical research program' rather than a scientific hypothesis. While Popper did not actually mean this as a dismissal of the theory of evolution, creationists perennially cite him as a prominent intellectual who rejected Darwin. Never mind that Popper later publicly corrected himself. *That* bit somehow never makes it into creationist propaganda.

More recently, it was positively disheartening to see prominent philosopher Thomas Nagel (he of 'What is it like to be a bat?' fame) in *The Times* endorsing the pro-intelligent design book *Signature in the Cell* by Stephen Meyer. However, the biggest splash yet has to be attributed to the profoundly inane *What Darwin Got Wrong*, co-authored by philosopher of mind Jerry Fodor and cognitive scientist Massimo Piattelli-Palmarini – neither of whom, interestingly, is either an evolutionary biologist or a philosopher of science.

This rather slim volume alleges to show why scientists and philosophers of science got evolution all wrong over the past 150 years, apparently without anyone noticing the blunder. It does so by means of a two-pronged attack, corresponding to the division of the volume into two parts, which I suspect are respectively mostly the work of Piattelli-Palmarini (first half) and of Fodor (second half).

The first section of the book claims that 'Darwinism' (a term used mostly by creationists, though the authors certainly do not belong to that silly lot) has put far too much emphasis on external causes of biological change, namely natural selection, and has ignored internal mechanisms.

This is actually an old debate in biology, going back to pre-Darwinian times; but Fodor and Piattelli-Palmarini write as if modern biologists were completely unaware of advances in molecular biology, genomics, and developmental biology. Indeed, Darwin himself had from the beginning talked about multiple mechanisms of evolutionary change, explicitly referring his readers to 'the laws of correlation of growth' – that is, to the fact that the internal structure of living organisms imposes limits and direction to evolution, because certain changes are made either more likely or impossible by the constitution of any given lineage. So it is astounding when Fodor and Piattelli-Palmarini deploy what they seem to think is a trump card against the theory of natural selection by asking 'Why can't pigs fly?' – the implication being that it's certainly not because of a lack of selectability, as it would obviously be advantageous for pigs to fly. As it happens, biologists have a very good answer to that question, which involves well-known constraints against the evolution of flight in vertebrates imposed by their genetics and developmental biology. No mystery here, and no crisis for 'Darwinism'.

The second part of *What Darwin Got Wrong* is even more bizarre. This is a philosophical attack, so I suspect it's largely the product of Fodor's thinking. The basic idea is that natural selection cannot be a scientific theory because it doesn't support counterfactuals [alternative possible outcomes]. Fodor asks us to consider frogs, which evolved the ability to catch flies by quickly extending their tongues. Biologists suggest that natural selection favored frog lineages that were better and better at capturing flies in this way, in the process weeding out those that were less efficient or couldn't do it at all. (Incidentally, we can measure natural selection currently maintaining or improving that behavior, both in the lab and in the field.)

"Ah," say Fodor and Piattelli-Palmarini – "but how on earth could natural selection be specifically for capturing flies? How can biologists exclude the counterfactual possibility that frogs evolved to catch dark spots dancing in front of them which happen to resemble flies, instead of catching flies *per se*?" In other words, without attributing intentionality to a natural process, how can biologists claim that the selection was for X, instead of for Y which happens to be correlated with X? Intentionality with an 's', (distinct from 'intentionality') is a mind's capacity for acting according to the meaning of words, such as to do something

*for* whatever reason. But even if the biologists were to attribute intensionality to natural selection, how could they legitimately do so given that natural selection is neither a law of nature nor the result of intelligent agency?

If you're scratching your head at this point, you'd be in the good company of just about anyone who has reviewed the book, biologists and philosophers alike. Biologists have long known about the problem posed by the possibility that selection may not act on a given trait, but on a correlated one. In the example above, selection to capture flies really means selection to capture anything that behaves sufficiently like a fly, regardless of its nutritional value. This is why hypotheses about natural selection are usually tested by means of functional analyses rooted in physiology, genetics and developmental biology, and why observations of selection in the field are whenever possible coupled with manipulative experiments that make it possible to distinguish between, say, flies and 'dark spots moving in front of your tongue' kinds of objects.

Philosophers of science have long dealt with the intensionality problem that Fodor and Piattelli-Palmarini pretend to have discovered out of the blue. The answer lies in distinguishing between selection *for* and selection *of*. In the case of the frogs, we can say that there is selection *for* capturing flies, but as a byproduct, there is also selection *of* the propensity to catch whatever small dark objects come within the frog's field of view which look sufficiently like flies. Incidentally, this difference is why, contrary to popular belief, natural selection is not an optimizing process – why it makes mistakes and is inefficient, yielding whatever outcome is good enough for survival and reproduction.

Yet another way to understand how strange Fodor and Piattelli-Palmarini's argument is, is to realize that if they were right and only law-like hypotheses supporting counterfactuals were to be given the status of science, then *all* the historical sciences would go down the drain, not just evolutionary biology. This flies in the face of all post-positivist scholarship in the philosophy of science.

By the end of the book, the reader will likely ask, What do Fodor and Piattelli-Palmarini purport to replace the theory of natural selection with? Apparently forgetting Bacon's injunction that every criticism (*pars destruens*) should be coupled with a positive argument (*pars construens*), Fodor and Piattelli-Palmarini do not bother to provide us with any plausible alternative narrative. That's probably why the book is so slim.

I'm afraid that the only results of *What Darwin Got Wrong* will be to provide even further ammunition to creationists (despite the self-conscious disclaimer of the authors in that respect) and to once again set back the relationship between philosophy and science. It will take much work by philosophers of science to repair the damage.

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*Massimo Pigliucci is Philosophy Now's science correspondent, and Professor of Philosophy at the Graduate Center of the City University of New York. He is the author of Nonsense on Stilts: How to Tell Science from Bunk (University of Chicago Press, 2010). His philosophical musings can be found at [www.platofootnote.org](http://www.platofootnote.org).*

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