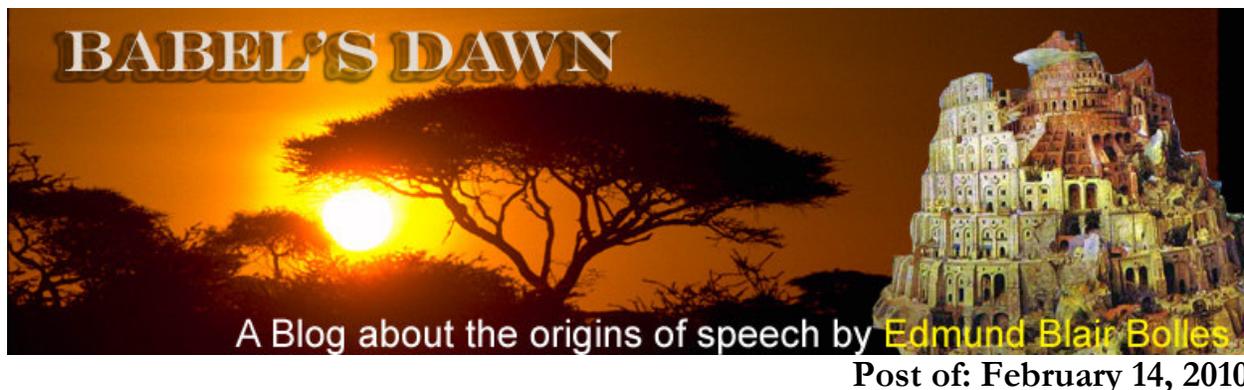
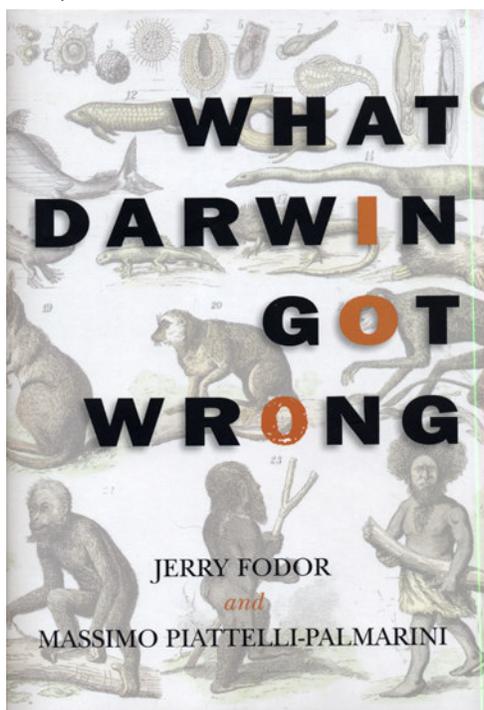


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Leading Cognitivists Reject Natural Selection



'Atheists Against Natural Selection!' That would make a good subtitle for a new book by two prominent cognitive philosopher/psychologists, [Jerry Fodor](#) and [Massimo Piattelli-Palmarini](#), to be published Tuesday, Feb.16: *What Darwin Got Wrong*. It seems designed to drive reviewers mad and lead them to curse rather than refute. I will try to avoid their clever ruse and see if I can discuss what they have to say without bursting into satire.

They begin with a rather defensive tone, proclaiming they are not creationists or intelligent designers. They announce they are atheists and secular humanists, and they still think Darwin was wrong. Or at least they think he was half wrong. The half they accept is actually older than Darwin. They accept as true what Darwin called 'descent with modification.'

Ever since geologists began turning up fossils of extinct animals, scientists have wondered if modern creatures are descended from those extinct animals, or if there have been a series of individual creations of species. Some people were of one opinion, some the other. The authors are

in the 'descended' camp. Good for them. So was Darwin's grandfather Erasmus and so was the great French naturalist Lamarck. But the problem is proving it—coming up with some natural explanation of how descent with modification might be possible.

Darwin and Wallace (let's not forget Wallace even though he did not make it into the book's index) are generally credited with solving the problem by proposing natural selection, although Wallace strongly objected to that term because it sounds like some agent is afoot making choices. The authors, however, reject this part of Darwin, leaving themselves in the position of a pro-evolutionist of, say, 1805. They believe current species are descended from past species, but "we don't know what the mechanism of evolution is." [p 153]

The authors begin by asking, "What kind of theory is the theory of natural selection?" and giving the quite unexpected answer, "The same kind as [\[B.F.\] Skinner's](#) theory of operant conditioning."

That gave me a laugh. When he began Skinner was one more scientist afflicted with physics envy, and he came up with a theory of psychology that read like a primer in Newtonian mechanics.

Later, however, as Skinner's prestige sank very low, he did publish a paper in *Science* magazine titled, "Selection by Consequences." (here's the [abstract](#)) in which he argued that natural selection and reinforcement are similar types of causal mechanisms. His point was that if you accept natural selection, you ought to accept operant conditioning. Fodor and friend argue the opposite direction: if you reject operant conditioning you ought to reject natural selection as well.

The authors do not mention Skinner's paper even in their nearly 25 page long bibliography. Perhaps they omitted it because they have a different sort of analysis to offer, one that would not have pleased Skinner half so much as his own description, and one that would have astounded Darwin. As the authors concede, their comparative ambitions "require a somewhat idiosyncratic exposition of N[atural] S[election]." [3]

For those too young to know, let me briefly explain operant conditioning. It is a psychology theory that tries to explain animal and human behavior in terms of cause (stimulus) and effect (response).

Operant conditioning associates a stimulus in the environment with a "reinforcer" (a reward or a penalty). For example, if a mouse passes through a red curtain and finds food on the other side, it will associate the curtain with the reward and after a certain number of such experiences the mouse can be reliably counted on to go through the red curtain.

This kind of learning has been demonstrated repeatedly in psychology labs. The main objection to the theory is its claim to reduce *all* learning to Newtonian mechanics. It never has explained anything about apt, original human activity, and [Noam Chomsky](#) managed to destroy its prestige in a brutal review of Skinner's attempt to explain speech in terms of operant conditioning.

We have seen in this blog that with the failure of Chomskyan linguistics to account for the psychology or biology of language, neo-Skinnerism has been making something of a comeback (see: [Guest Defends Skinner](#)) None the less, Fodor and Piattelli-Palmarini assert that nobody takes operant conditioning seriously any more and that they can seriously damage the theory of natural selection if they can show it is identical to Skinner's theory. And I have to say, as somebody who never much liked Skinner's claims to have solved all learning, that I agree with the authors. If they can marry Darwin and Skinner, they will damage Darwin. Too bad for them, their effort flops.

Their main point is that both operant conditioning and natural selections serve "as a function that maps certain sorts of inputs onto certain sorts of outputs." [3] Maybe, but a less idiosyncratic way of describing natural selection is to say that each generation contains variety and that the more fit members survive to produce another generation. Is there something analogous in operant conditioning?

In operant conditioning, responses to an input vary and certain responses are reinforced. These reinforced responses become more common just as naturally selected members of a species become more common.

So there is the variety and selection, but where in this analogy is the generation?

Operant conditioning has cycles, but not generations. In cycles, processes are repeated. In generations, individuals are reproduced. The output in operant conditioning is not another version of the input. This absence of an analogy with generations leads to a breakdown in several attempts by Fodor and Piatelli-Palmarini to skewer Darwin by complaining about Skinner. For example the authors say that both Darwinian and Skinnerian phenomena “are very largely the effects of environmental causes.” [6] Yes, but the environment's role differs in each system. .

In operant conditioning, a stimulus leads to a response. The stimulus comes from the environment and the response is shaped by the animal. Stimulus + response constitutes one cycle of Skinner's process.

In a Darwinian generation, the organism is shaped by its genetic inheritance and the environmental filter either does or does not allow that genetic inheritance to be passed on. The two distinct processes have opposite structures:

operant conditioning:

- Input—environment dependent;
- Output—organism dependent.

natural selection:

- Input—organism dependent;
- Output—environment dependent.

The authors trip themselves up again over the same business of the difference between cycles and generations. In a mathematical mood, they talk about how selection and conditioning are “monotonic” functions, i.e., not subject to other variables. Behavior is strictly subject to reinforcement and species are strictly subject to selection.

Of course we know that there are other factors in evolution like drift and sexual selection, but I can tolerate their remarks because they are concerned primarily with adaptation, which is the result (says I) of natural selection. Their point is that, “In real life ... practically nothing is a monotonic function of practically anything else.” [9] But again the authors are tripped up by the lack of generations in operant conditioning.

In an operant-conditioning cycle an action is reinforced or not. Then it is on to the next cycle. But an organism is subject to many selective filters during a single generation. A wildebeest outruns a lion and a neighbor dies instead. Speed survived. Perhaps, however, the speed arises from slightly longer legs that provide greater striding but make for a more tottery stance when fighting other wildebeest. The long-strider has a harder time holding a territory and mating. Natural selection demands, many trade-offs.

In Wallace's original paper describing natural selection (available in my anthology, [Galileo's Commandment](#)), he compared the process to a ship's governor that holds the ship on course by a thousand little adjustments that happen so fast they go unnoticed. This is the very opposite of the one-variable-fits-all process the authors complain about. Physical cycles and biological generations are different kinds of things used in different sorts of theories to describe different kinds of systems.

Next week I will discuss how the authors adhere to a view of language and knowledge that is *prima facie* impossible with natural selection. They could rethink the work they have been doing for these many decades. Instead they prefer to call for the rethinking of a century and a half of biology.

Links:

Jerry Fodor: <http://rucss.rutgers.edu/faculty/Fodor/cv.html>

Massimo Piatelli-Palmarini: <http://dingo.sbs.arizona.edu/~massimo/>

What Darwin Got Wrong:

<http://www.amazon.com/gp/product/0374288798?ie=UTF8&tag=tellingitcom-20&linkCode=xm2&camp=1789&creativeASIN=0374288798>

B.F. Skinner: <http://www.bfskinner.org/BFSkinner/Home.html>

Selection by Consequences: <http://www.sciencemag.org/cgi/content/abstract/213/4507/501>

Noam Chomsky: <http://www.chomsky.info/>

Guest Defends Skinner: http://www.babelsdawn.com/babels_dawn/2009/07/poverty-of-the-stimulus-part-4-in-defense-of-skinner.html

Galileo's Commandment:

<http://www.amazon.com/gp/product/0805073493?ie=UTF8&tag=tellingitcom-20&linkCode=xm2&camp=1789&creativeASIN=0805073493>