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SYMPOSIUM

Clever evolution

Samir Okasha: Agents and goals in evolution. Oxford: Oxford University Press, 2018, xiv + 254pp, £30.00 HB

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Why and when did "teleology" become a dirty word in biology? I call it a dirty word because many think it refers to some forbidden practice which should not even be discussed, and by making the practice *unmentionable,* this opinion prevents us from examining it calmly and carefully to see whether or not it is as horrible as it is cracked up to be. Marx's famous verdict about *Origin of Species* is ambiguous:

> Not only is a death blow dealt here for the first time to 'Teleology' in the natural sciences but their rational meaning is empirically explained. (1861)

Does Darwinian evolutionary explanation banish all or vindicate some teleological thinking? In *From Bacteria to Bach and Back* I raised this question and went on to observe:

> It is of course open to defend an intermediate position that forbids certain teleological excesses but licenses more staid and circumscribed varieties of talk about functions, and philosophers have devised a variety of such views. My informal sense is that many scientists assume that some such sane middle position is in place and must have been adequately defended in some book or article that they probably read years ago. So far as I know, however, no such consensus classic text exists, and many of the scientists who guiltlessly allude to the functions of whatever they are studying still insist that they would never commit the sin of teleology. (2017, 34–35)

Samir Okasha's 2018 book might well become the consensus classic text for biologists to fall back on when they find themselves unable to resist both function talk and agent talk in the course of their inquiries and explanations. It covers the ground with admirable clarity, caution and scholarship, delving in detail into the formal work by Hamilton, Maynard Smith, Grafen, Trivers and others, while also considering a wealth of theoretical and empirical research in behavioral ecology, cognitive

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ethology, economics and psychology. And it concludes with the eminently sane and well-supported answer to its primary question, "whether the prevalence of agential thinking in evolutionary biology is a reflection of objective biological facts, or of the human predilection to anthropomorphise. The answer is 'a bit of both'" (232).

Not surprisingly, my favorable evaluation of the book is enhanced by Okasha's insightful treatment of my claim (since 1983) that, since biology is inescapably a matter of reverse-engineering the organisms that evolution has produced, it should adopt the intentional stance toward not just organisms, including plants and even bacteria, but toward the process of natural selection itself. While abjuring all assumptions about foresight or purpose in natural selection, we should take very seriously wise Crick's wise-crack, "Evolution is cleverer than you are." Mother Nature is competent without comprehension (Dennett 2017), and manages by brute force algorithmic trial-and-error to accomplish feats of design that dwarf the efforts of intelligent designers.

Okasha finds merit in this perspective but goes on: "I find Dennett's appeal to 'mother nature' here under-motivated, and not necessary to capture the parallel between adaptationist and psychological explanation that I take to be his main insight" (40). Okasha would prefer to restrict "agential thinking" to organisms, but he himself recognizes the difficulty with any *criteria* for agency: "it is unclear how much behavioral plasticity counts as sufficient" (27). Here is the bind for the biologist: the cactus, for example, is about as stolid and clueless as an organism can be, yet its dispositions and parts are fiendishly well designed for furthering its interests.

> When we human observers/explainers/predictors confront this well-designed excellence, we automatically set about figuring out the reasons why plants and animals do what they do, reverse engineering them with the aid of the intentional stance. And, as we have seen, when we do this it is common and natural to impute more understanding to an organism than it actually has, on the reasonable grounds that the behavior is manifestly clever, and whose cleverness is it, if not the organism's? Ironically, if we were creationists, we could comfortably attribute all the understanding to God and wouldn't feel so compelled to endow the organisms with it. They could all be God's marionettes. It was Darwin's discovery and exposure of the mindless process of natural selection, with its power to generate free-floating rationales, that freed our imaginations to continue reverse engineering all Nature's marvels without feeling an obligation to identify a mind that harbors the reasons we uncover. (Dennett 2017, 339)

One good motivation, then, for adopting the intentional stance toward evolution itself is that it smothers the temptation to attribute understanding wherever we find design excellence. Organisms are genetically gifted with many talents they need not understand. Explaining why these are *features* (not bugs) entails saying what they are *for,* and *why* they are so good—the free-floating rationales that do not have to be represented in any mind at all. The pendulum swing between *romantic* and *killjoy* interpretations of the clever behaviors of animals (Dennett 1983) can be damped with the recognition that the intentional stance

will "work" up to a point (but don't ask for a bright line) and that we can get a *predictive and explanatory appreciation* of the powers and foibles of organisms without the burden of attributing human-like minds to them. What does the frog's eye *really* tell the frog's brain? Or should we ask, as Michael Arbib once suggested to me in conversation: what does the frog's eye tell the frog? Do frogs *really* have beliefs? Do chimpanzees have beliefs about the beliefs of other chimpanzees? For that matter, do *we* understand the reasons why we do many of the things we do? Do we, for instance, appreciate the complex Gricean conditions for utterance meaning? (Dennett 2017, 395) Once one begins to appreciate how ubiquitous *competence without comprehension* can be, a host of largely sterile debates in ethology, psychology and the philosophy of mind and language can be allowed to evaporate.

Jean Piaget noted that "intelligence is what you use when you don't know what to do: when neither innateness nor learning has prepared you for the particular situation" (see Piaget 2019). Guy Claxton, at a conference at New College of the Humanities in London (2018), came up with an improvement on Piaget's observation:

> Intelligence is knowing what to do when you don't know what to do.

What is particularly *bon* about this *mot* is that it draws attention to the capacity of *some* minds to go beyond the gifts of genetic inheritance, culturally transmitted techniques (memes), and personal experience, by engaging in something like problem-solving, generating new design in situ. Or, as one might say, intelligent design. It is this capacity, which is as rare as hens' teeth in non-human species, that requires the attribution of high levels of comprehension. And it is only we human beings who have managed to find this exploratory platform from which to launch our inquiries into what happens and why in biology and the rest of the universe. Looking at the Tree of Life, we find only *anthropoi* anthropomorphizing, but with spectacular results.

I cannot resist pointing out that Okasha himself sometimes succumbs to the motivation to explain a point with the help of Mother Nature. "The moral here is that natural selection 'cares' about the variance in reproductive output, not just the expectation, so displays a kind of intrinsic aversion to risk" (212). See also, for example, his examination of bet-hedging by natural selection (221–9). These are wonderfully effective observations, and there are plenty more to be obtained by treating not only natural selection but genes themselves as intentional systems or rational agents.

Okasha has a sympathetic reading of Dawkins (and Burt and Trivers and Hamilton and Haig) on genes as selfish agents and decides that "the real merit of the 'genes as agents' concept, as I see it, is that it allows us to achieve an adaptationist understanding of a class of phenotypic traits that would otherwise seem puzzling" (46). This is a huge understatement, in my opinion. Without this perspective, many features of the natural world *and the cultural world* are not just puzzling but *bound to be misunderstood*. One of the chief virtues of adopting the gene's-eye perspective, or the meme's-eye perspective, is that it enables one to

see the continuity of process, and of explanation, between all the different levels of evolution, from "outlaw" genes through individual organisms and lineages to "parasitic" memes: in every case we must ask: *Cui bono?*—who benefits? The first answer is always the same: winning replicators are the beneficiaries. There will usually be reasons why they have won up to now, but do not expect them, as a general rule, to understand these reasons. Stupid heirs are even more common in biology than in New York City.

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