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COMMENT ON BOUDRY

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Maarten Boudry offers as clear and insightful an evaluation of memetics as I have seen, and let me begin by saying that I agree with him that while the memetic *perspective* is often extremely useful and explanatory, a "science of memetics" is not something to strive for. We can take memes seriously without founding a distinct science of them. (There is no field of *predatorology* or *nichetics*, but the concepts of *predator* and *niche* are uncontroversially valuable.) I am also in agreement with just about everything in his essay, and in particular I applaud the way he shows how his work with Hofhuis can account for an insidiously well-designed social phenomenon without finding, or needing to find, any villains to blame.

Boudry cites Millikan's point about the superfluity of the memetic perspective when dealing with most human endeavor, where *our* purposes and our genes' purposes seem to exhaust the field:

> Side effects and mishaps resulting from use of these [basic cognitive] mechanisms will surely occur, but there is no reason to suppose that they systematically produce memes with purposes of a different kind from those either of the genes or of the psyche [Millikan (2004), pp. 18-19].

Boudry thinks that I have not dealt with this issue heretofore, and while it is true that I haven't explicitly responded to Millikan's objection (*mea culpa!*), my discussion of the de-Darwinization of cultural evolution in my book is largely addressed to just that issue, and also expresses my attempts to distance myself from what Boudry calls *panmemetics*. I am not happy with that term, however, since, it treats as "memes" only the items in the maximally Darwinian corner of the PGS space, and thus seems to deny that the intelligently designed memes of modern culture are just as governed, in the end, by natural selection as intelligently redesigned domesticated animals and genetically modified plant species.

But let me now deal explicitly with the Millikan quote, echoing what Boudry himself says. The relation between the purposes of the genes and the psyche, in Millikan's nice phrase, is complicated. The "basic cognitive mechanisms" have been tuned by evolution to *approximate* what David McFarland (1989) calls the "goal function," by executing a "cost function" that tracks the goal function when all goes well. And when it doesn't, the "side effects and mishaps" that are generated by the machinery yield an organism that actively, controlledly pursues a path that is sub-optimal (from the genes' point of view). Thus are the purposes of the psyche distinguished from the purposes of the genes. This happens all the time, in organisms from bacteria to buffalos, and we typically get a better, more proximal account of what the organism is doing and why by positing both species-wide and individualized cost-functions that are directly in charge. We can then say what that fish *wants to do* and ask whether it ought to want to do that (given its genes and its environmental circumstances), and we can say what the oak tree *wants to do* in the same spirit. (The intentional stance in action.) Some of the most striking cases are host-manipulations by parasites, such as the lancet fluke that drives the ant up the blade of grass [Dennett (2006)]. This is no mere side effect or mishap but a phenomenon *designed by evolution* to exploit the host for the benefit of the parasite. The fluke is clueless, of course, but the design rationale (the free-floating rationale) is unmistakable. What a fluke or a virus can evolve to do mindlessly, a meme can evolve to do mindlessly. So I agree with Boudry that *there is* a reason to suppose that these cognitive mechanisms can systematically produce (and reproduce and reproduce) memes with their own purposes.

Boudry is right that in modern human culture, the meme perspective is often of vanishing utility — and $E=mc^2$ is a fine example, since the rationale for its ubiquity is so well-anchored in intelligently designed science. (Why is $E=mc^2$ so populous while $A=bc^5$ will get reproduced only a few thousand times, mostly in an electronic larval stage, though no doubt some readers of this essay will encounter it in hard copy and briefly allow it to reside in their brains before the individual lineages go extinct, the species surviving only via spores of sorts in the Cloud?) But even this canonical example of an intelligently designed brainchild has effects that *require* the meme's-eye perspective to explain: We don't find Maxwell's equations, or even Newton's $F=ma$, emblazoned on T-shirts, and the vast majority of those who harbor, reproduce, and transmit $E=mc^2$ have only the vaguest idea what it means. The explanation of why Einstein's equation became an icon has an explanation that begins in physics but

soon migrates to psychology, sociology, anthropology — in short, to *memetics* understood as a perspective within these *-ologies,* rather than a separate science. History, as Boudry and Hofhuis (2018) show, is another discipline that can make good use — on occasion — of the meme's eye point of view.

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