THE APE THAT UNDERSTOOD THE UNIVERSE: HOW THE MIND AND CULTURE EVOLVE.

By Steve Stewart-Williams. Cambridge and New York: Cambridge University Press. $27.95. xii + 368 p.; ill.; index. ISBN: 978-1-108-42504-9. 2018.

What explains the distinctive features of human behavior? In this volume, Stewart-Williams aims to answer this ambitious question. This is an engaging addition to the already long list of recent attempts to provide an evolutionary explanation of human uniqueness. It is organized into six chapters, plus two appendixes. The chapters address several key topics in evolutionary theory, sex differences and sexual behavior, altruism, and cultural evolution, albeit with varying degrees of detail and depth. These topics include sexual selection, kin selection, Hamilton's rule, reciprocal altruism, costly signaling theory, group selection, gene-centered views of evolution, inclusive fitness, proximate and ultimate evolutionary explanations, inbreeding avoidance, the Westermarck effect, jealousy, sperm competition, mating and parenting effort, cumulative cultural evolution, imitation and learning biases, evolutionary mismatch theories, and more.

The book opens with a thought experiment: How would an extraterrestrial scientist understand the peculiarities of human behavior? Answering this question is the aim of the volume. Although there is little doubt that human behavior is different in important respects from other species, the motivation behind this question seems to be some form of human exceptionalism: "This book is about the strangest animal in the world—the animal that's reading these words and the animal that wrote them: the human animal" (p. 1). Many comparative researchers will find this starting point somewhat problematic. We can claim to be the strangest or the weirdest creatures on Earth only by projecting our own values onto nature.

Rather than aiming to offer a new evolutionary perspective on human nature, the author relies on different insights from evolutionary psychology and cultural evolutionary theory to carry out this endeavor. The volume stands out, instead, for his overarching approach. Unlike any other book in the recent literature, *The Ape That Understood the Universe* relies on a robust commitment to a gene-centered view as a foundational approach to evolutionary theory. It also strongly advocates for a memetics approach to cultural evolution. In a nutshell, according to this view, natural selection operating on genes gives rise to gene machines, while natural selection operating on memes gives rise to ideas and ideologies that transform human gene machines into meme machines.

Readers sympathetic toward the ideas of Richard Dawkins and Daniel Dennett will find this a stimulating volume that targets a broad audience. However, this is not a book for all readers. It navigates a complicated niche of theories and ideas ("memes" in the author's words) that is currently dominated by authors such as Joseph Henrich (2016. *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter.* Princeton (NJ): Princeton University Press), Richard Boyd (2018. *A Different Kind of Animal: How Culture Transformed Our Species.* Princeton (NJ): Princeton University Press), Cecilia M. Heyes (2018. *Cognitive Gadgets: The Cultural Evolution of Thinking.* Cambridge (MA): Belknap Press of Harvard University Press), and Michael Tomasello (2019. *Becoming Human: A Theory of Ontogeny.* Cambridge (MA): Belknap Press of Harvard University Press). In this highly competitive world, *The Ape That Understood the Universe* does its best to survive and replicate at a time where gene-centered views of evolution and memetic accounts of culture are under fire, if not completely dismissed.

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EVOLUTIONARY CAUSATION: BIOLOGICAL AND PHILOSOPHICAL REFLECTIONS. *Vienna Series in Theoretical Biology.*

Edited by Tobias Uller and Kevin N. Laland. Cambridge (Massachusetts): MIT Press. $60.00. vii + 352 p.; ill.; index. ISBN: 9780262039925. 2019.

This book is an impressive achievement. Recognizing that a scope as broad as "evolutionary causation" should require genuine collaboration between evolutionary biologists and philosophers of science, the editors have brought together 15 contributions spanning the gamut from what we might call "pure" philosophy of science to "pure" biological works. Of course, it is well known that producing genuine, transformational interdisciplinarity work—work, that is, where scholars from multiple disciplines come together not just to talk at one another, but rather to think in ways that transcend their traditional disciplinary ways of working—is an extremely difficult task.

This is made all the more challenging in this case by the fact that "evolutionary causation" itself has two profoundly different meanings for each field. For biologists, this phrase calls to mind concerns about enumerating the various kinds of processes that might impinge on organisms over evolutionary time. Given the volume's connection to the project of the "extended evolutionary synthesis," this takes the shape here of considering the roles and scope of processes such as evo-devo, niche construction, phenotypic plasticity, and so forth. For philosophers, on the other hand, a natural move is to consult general theories of causation (one of the oldest topics in the discipline), and apply them to various parts of