

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. How-

ever, 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.

IVAN GONZALEZ-CABRERA, *Konrad Lorenz Institute for Evolution & Cognition Research, Klosterneuburg, Austria*

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 interdisciplinary work—work, that is, where scholars from multiple disciplines come together not just to talk to 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

the evolutionary process. The volume is at its best when its authors are recognizing—even trading on—this ambiguity. The contributions of Helanterä and Uller, of Watson and Thies (on the biological side), and of Chiu and of Stotz (on the philosophical side) are particularly noteworthy in this regard. These chapters weave together promising contemporary philosophical work with extensive empirical and theoretical support, producing in the process wholes that are greater than the sum of their parts.

As already mentioned, this book forms part of the broader cluster of recent work on the “extended evolutionary synthesis.” As such, it is delightfully expansive, covering a huge amount of biological and philosophical phenomena of interest. Topics as diverse as the modeling of directed mutation and the continued utility of Ernst Mayr’s distinction between proximate and ultimate causes all fall within the book’s remit. It thus forms an enjoyable, if somewhat polemical, survey of a wide variety of current trends in empirical, theoretical, and philosophical approaches to the process of evolution. In short, I strongly recommend it for anyone interested in either the biological or the philosophical formulation of the problem of evolutionary causation. Last, it is appropriate to pause here to mourn the recent loss of Karola Stotz. Her outstanding contribution to this volume indicates precisely why she will be so keenly missed.

CHARLES H. PENCE, *Institut Supérieur de Philosophie, Université Catholique de Louvain, Louvain-la-Neuve, Belgium*

DELEUZE AND EVOLUTIONARY THEORY. *Deleuze Connections*.

Edited by Michael James Bennett and Tano S. Posteraro. Edinburgh (United Kingdom): Edinburgh University Press. £75.00. vi + 194 p.; ill.; index. ISBN: 978-1-4744-3049-4 (hc); 978-1-4744-3051-7 (eb). 2019.

The French philosopher Gilles Deleuze (1925–1995) had a long-standing interest in evolution. Perhaps not entirely unexpectedly, although he expressed admiration for Charles Darwin, his conception of evolution owed rather more to Henri Bergson, filtered through the historical and philosophical perspectives of Michel Foucault. This meant there was always a somewhat iffy relationship to natural selection. On one hand, as in the thinking of the early 18th-century biologist Geoffroy Saint-Hilaire, there was a downplaying of adaptation—the key thing that natural selection is supposed to explain—and more focusing on notions of homology—the isomorphisms as found between organisms of very different kinds. On the other hand—here we do see the influence of Bergson—there was an urge to put direction into the evolutionary process, so all is not left to the randomness of selection working blindly on undirected variations.

As is pointed out by Bennett and Posteraro, the coeditors of *Deleuze and Evolutionary Theory*—the

13th volume in an English-language series devoted entirely to Deleuze’s thinking—in respects this makes Deleuze more fashionable and perhaps more relevant today than he would have been 30 or 40 years ago. There is lots of talk now of moving on beyond the traditional synthetic theory of mid-20th-century evolutionary thinking to an “extended synthesis” or some such thing, which takes into account things such as development and the effects of the environment. Something not necessarily yielding full-blown Lamarckism, but certainly more sympathetic to that kind of thinking than one would have found in the writings of someone like George Gaylord Simpson.

This relatively short collection has eight chapters. Some, such as Allen’s *Unnatural Nuptials*, are focused more on explicating Deleuze’s thinking. Allen makes much of Deleuze’s enthusiasm for the notion of symbiosis, stressing as it does the more organic, holistic nature of evolution, as against the somewhat reductionistic thinking of *On the Origin of Species*. Hortle and Stark’s *Framing Sexual Selection: Elizabeth Grosz’s Work on Deleuze, Darwin and Feminism*, obviously reflect some of the more trendy social concerns of the present. Philosophically, Deleuze always stressed difference over identity, and this fits nicely with the idea of two different sexes.

Some contributions are more interested in connecting Deleuze to contemporary debates. Bennett’s *Deleuze, Developmental Systems Theory and the Philosophy of Nature*, fits right in here. And some, for example, Smith’s *Against Social Evolution: Deleuze and Guattari’s Social Topology*, do turn more to the cultural. Félix Guattari was a French psychotherapist with whom Deleuze collaborated often in his later writings.

Expectedly, the jargon index is often high—very high. This is not a volume that would be given the stamp of approval by Steven Pinker. Sometimes, the claims are suspect to the point of worrisome. It is outrageous to say that Darwin did away with teleology and that his embrace of homology shows this. In the *Origin*, Darwin says explicitly that “conditions of existence” (final causes) outweigh “unity of type” (isomorphisms). Also, I could not but note the total absence of discussion of any serious empirical work being done in evolutionary circles. That said, it would be silly simply to put this book aside without more reflection. Deleuze in respects foretells a loud movement in evolutionary circles today. For those who think this important, the essays in this collection are worth the effort.

MICHAEL RUSE, *Program in the History & Philosophy of Science, Florida State University, Tallahassee, Florida*