Richard Joyce, ed. *The Routledge Handbook of Evolution and Philosophy*. Routledge 2018. 442 pp. $240.00 USD (Hardcover ISBN 9781138789555).

'The connection between contemporary academic philosophy and Darwin's theory of evolution,' as Richard Joyce plausibly describes it in the preface to his collection on evolution and philosophy, 'is a two-way street' (xix), with philosophers of biology trying to arrive at a better understanding of the concepts and principles of evolutionary biology while their colleagues attempt to ascertain what implications, if any, those concepts and principles have for the traditional problems of philosophy. Both directions of traffic are represented here, just about evenly, with thirty contributions from a host of authors, mainly philosophers and scientists (for the most part, interestingly, cognitive psychologists rather than biologists). After Joyce's brief preface, the book is divided into six parts. Each part begins with a chapter that, as the preface explains, 'takes a broader perspective and strikes a more introductory tone, in the hope of providing the subsequent more focused chapters with a context' (xx).

Part I, on the nature of selection, begins with a useful overview by Tim Lewens that carefully explains the differences between Darwin's conception and modern conceptions. Elisabeth A. Lloyd describes the units of selection debate within her well-known framework of four questions: 'What is the interactor? What is the replicator? What is the beneficiary? What entity manifests engineering adaptations resulting from evolution by selection?' (22). Ellen Clark analyzes a famous dispute ostensibly over selection which, she concludes, is also over the related concepts of adaptation and organism. Jonathan Birch carefully distinguishes different notions of fitness maximization, ending with the anodyne recommendation that biologists should not assume fitness maximization except by way of hypothesis. Karen Neander answers the question 'Does Biology Need Teleology?' in the affirmative, recommending—but not insisting on—the etiological notion of function of which she is a long-time defender.

Ulrich Stegmann's introduction to part II, on evolution and information, concentrates on 'the sort of information that one thing can carry about another … "natural information"' (79) in Fred Dretske's sense, without significantly connecting it to biology, and the chapters that follow seem not to make use of the notion. Nir Fresco, Eva Jablonka, and Simona Ginsburg offer what is, despite a plethora of definitions, a rather opaque discussion of learning and information, while Karola Stotz and Paul Griffiths intriguingly extend Francis Crick's definition of genetic information in terms of biological specificity to epigenetic and exogenetic information. Kim Sterelny offers a sketch—or rather 'a sketch of a sketch'—of his explanation of the evolution of human language anchored in the paleoanthropological record; it will be exciting to see the continuing development of his ideas. Nathalie Gontier and Michael Bradie describe a number of different approaches to evolutionary epistemology.

Part III, on human nature, begins with Stephen M. Downes's overview, arguing that although evolutionary biology is often supposed to underpin a coherent biological conception of human nature, it in fact undermines it. The two chapters that follow have little to say directly about human nature (Downes, to his credit, makes a point of explaining their relevance). John Wilkins's gem of a chapter clearly explains his view that species are not theoretical entities but real phenomena. Joseph LaPorte's chapter defends the unpopular view that species have essences, detaching the notion of essence from its traditional metaphysical baggage, while not making it clear why the result is supposed to be of interest to either philosopher or biologist. Louise Barrett argues that the notion of human nature is bankrupt because nature and culture cannot be disentangled, while in contrast Maria

Kronfeldner offers a case study showing the usefulness to the twentieth-century anthropologist Alfred L. Kroeber of positing a divide between nature and culture.

Valerie Hardcastle's introduction to part IV, on evolution and mind, suggests that regarding the mind as an evolutionary adaptation helps to 'clarify the conceptual landscape' and to 'define the appropriate methodologies for learning about minded creatures' (231). As if following her advice, Edward W. Legg, Ljerka Ostojić, and Nicola S. Clayton examine three possible cases of evolutionary convergence in cognition: food storing, tool use, and episodic memory. Kari L. Theurer and Thomas W. Polger recommend addressing piecemeal questions about the evolution of particular examples of consciousness, and do so for nociceptive pain. Edouard Machery carefully argues that 'while plasticity may challenge some forms of modularity, it also requires a substantial amount of modularity' (268). In a chapter that could have been included just as well in part III, Justine Kingsbury contends that the lack of determinate content assigned by teleosemantics to simple representations is a feature rather than a bug.

Part V, on evolution and ethics, curiously lacks any contribution from Joyce himself, despite his well-known work in the area (e.g., *The Evolution of Morality* [2006]). In her overview chapter, Catherine Wilson discusses 'descriptive evolutionary ethics'—the evolutionary data and theory relevant to ethics—in some detail before turning to a brief discussion of evolution's supposed implications for metaethics. Christine Clavien and Chloë Fitzgerald offer a clever account of moral intuitions and a phenomenological account of the feeling of rightness. Darcia Narvaez complains that childrearing in modern industrialized societies is 'species-atypical' and likely to impair moral development. Ben Fraser invokes evolution in arguing for a version of reductive naturalism about moral norms on which moral thinking 'is not fully vindicated, but nor is it entirely debunked as a mere adaptive fiction' (341), while Daniel R. Kelly similarly considers the prospects for evolutionary debunkings of morality, though at a higher level of generality.

Stephen Davies's introduction to part VI, on evolution, aesthetics, and art, instructively addresses the origins and the possible adaptiveness of both art and aesthetics, emphasizing the difficulty of drawing hard and fast boundaries in these areas. Anton Killin focuses on music and human evolution, stressing (like Davies) that gene-culture co-evolution and niche construction undermine the assumptions underlying debates about adaptiveness. Helen De Cruz and Johan De Smedt offer a neatly argued evolutionary perspective on emotional responses to fiction, which, they argue, can be adaptive in non-obvious ways. Brian Boyd's chapter argues for the worth of an evolutionary approach to literature for both the reader and the theorist, although his reading of Carol Ann Duffy's 2005 poem 'Cuba' was not a particularly convincing case study. Patrick Bateson's 'Play and Evolution' addresses a topic seldom addressed in the philosophical literature, albeit without any philosophical novelties.

Overall, there is a lot to like about *The Routledge Handbook of Evolution and Philosophy*, which amply shows that the two-way street to which Joyce refers in his preface is bustling with profitable traffic—particularly in the vicinity of the intersection of evolutionary biology, philosophy, and cognitive psychology. The individual chapters are generally of a high quality: the overviews are all especially useful treatments, and the chapters by Wilkins, Sterelny, Clavien and Fitzgerald, and De Cruz and De Smedt were particularly worthwhile. The innovation of beginning each part with a chapter of overview was a good idea on the editor's part—it seems to be unique in the Routledge Handbooks in Philosophy series—but it was perhaps not as well executed as it could have been. With the exception of part III, there was little indication of any interaction between the author of the overview chapter and the authors of the following chapters in the same part, resulting in unnecessary disagreements, divergences, and redundancies.

Regrettably, the book is priced discouragingly high, especially for a volume that is (by design) not a compendious resource on the philosophy of biology. A reader seeking such a resource is likely to prefer *A Companion to the Philosophy of Biology* (2011), edited by Sahotra Sarkar and Anya Plutynski; *The Cambridge Companion to the Philosophy of Biology* (2008), edited by David L. Hull and Michael Ruse (2008); or *The Oxford Handbook of Philosophy of Biology* (2008), edited by Michael Ruse. On the other hand, a reader wanting a reference on a single topic addressed in Joyce's collection is likely to prefer a book devoted to that topic: for the reader interested in evolution and ethics, for example, there are collections such as *The Cambridge Handbook of Evolutionary Ethics* (2017), edited by Michael Ruse and Robert J. Richards. But a reader whose interests in evolution and philosophy happen to be addressed by its contents may find *The Routledge Handbook of Evolution and Philosophy* worth the price.

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