ideas. The unacknowledged problem here, however, would be that Wallace's theory of human evolution involved a large miracle at the base of what we now call the hominin tree. So, to stick with "Darwinism"—however loose the meaning—roots evolutionary theory in the world of the real, which "Wallaceism" would not. Ultimately, however, this volume is the product of a widely read scholar, largely in direct reaction to the words of previous scholars. It is thoughtful, sometimes idiosyncratic, and occasionally provocative.

Jonathan Marks, *Anthropology, University of North Carolina, Charlotte, North Carolina*

Life and Mind: Theoretical and Applied Issues in Contemporary Philosophy of Biology and Cognitive Sciences. *Interdisciplinary Evolution Research, Volume 10.*

Edited by Mariano Martín-Villuendas, Juan Gefaell, and Ana Cuevas-Badallo. Cham (Switzerland) and New York: Springer. $219.99. xiv + 288 p.; ill.; no index. ISBN: 978-3-031-70846-6 (hc); 978-3-031-70847-3 (eb). 2024.

This volume, the 10th in the series *Interdisciplinary Evolution Research*, contains 11 original articles and an introduction by the editors, all originating from the 11th International Philosophy of Biology and Cognitive Science (PBCS-XI) workshop held in Salamanca, Spain, in 2022. The main aim of the book is to unite some of the most prominent current debates in the philosophy of biology and the philosophy of cognitive science through a "practice-based approach" (p. 2). According to this view, the meaning of a concept is "the use it has within a certain course of action" (p. 2). This is intended to mark a shift "from theories and other end products of inquiry to processes and activities" (p. 2) in their relevant contexts, and a transition from "representations as descriptions" to "representations as means for doing things" (pp. 2–3).

The volume is organized into two parts: Theoretical and Applied Issues in Current Philosophy of Biology (Part I) and Theoretical and Applied Issues in Current Cognitive Sciences (Part II). Although Part I offers some interesting new takes on the topics of biological function, reductionism, emergence, causation, and chance, these are hardly novel issues within the field. It notably omits some of the most prominent topics in the philosophy of biology from recent years, such as the nature of organisms, evolutionary developmental biology, biological individuality, biological agency, or the extended evolutionary synthesis. Furthermore, the topic of pain dominates Part I, which arguably belongs in the second part. Indeed, the introduction provides no clear rationale for combining the philosophy of biology and the philosophy of cognitive science into a single volume. This absence of a unifying theme is underscored by a "cross-contamination" of cognitive topics in the biology section, which exposes the artificiality of the division. In this sense, a relevant current topic that is missing from this volume is precisely the "cognitive turn" in biology—the idea that cognition, and other traditionally mental capacities such as agency or sentience, extends "all the way down" to plants and even unicellular organisms.

Despite this omission, readers should be aware that core current issues in the philosophy of biology are quite independent of cognitive science, and vice versa. The second part of the book is more representative of current issues in the philosophy of cognitive science. It includes discussions of the 4E framework (embodied, embedded, enacted, and extended cognition), particularly ecological psychology, enactivism, the free energy principle, as well as animal cognition and an interesting defense of instinct concepts. However, the strong pragmatist interpretation of the editors' "practice-based approach," which is meant to unify the volume, is only explicitly discussed and practiced in a few articles.

Readers should be aware that this collection is intended for a specialized audience rather than as an introduction. Overall, the book contains some well-written, well-argued, and thought-provoking articles that stand on their own merits, irrespective of disciplinary divisions or the latest "turn" in the philosophy of science.

Fermin C. Fulda, *Philosophy, University of Toronto, Toronto, Ontario, Canada*

Philosophy of Physiology. *Cambridge Elements in the Philosophy of Biology.*

By Maël Lemoine. Cambridge and New York: Cambridge University Press. $22.00 (paper). iv + 79 p.; ill.; no index. ISBN: 9781009370370. 2025.

What is health? What is disease? These are two of the most addressed questions in contemporary philosophy of medicine, forming a now-standard debate structured around two rival camps: naturalists, seeking the answers in biological notions of function and dysfunction, and normativists, arguing that health and disease should be understood as social, value-laden concepts. The first section of Maël Lemoine's short introduction to the philosophy of physiology inscribes it clearly within this debate, looking for answers to these questions in physiology and medical science.

As the author argues, there exists a scientific field that explores the functions and dysfunctions of organisms: namely, physiology. The physiological notion of a "disease entity," a set of causal pathophysiological processes, corresponds, Lemoine claims,

to the way in which medical science identifies, understands, and explains diseases. The difficulty arises when we want to generalize across these disease entities: generally applicable "theories of disease" are, for reasons the author clearly lays out, difficult to establish.

This, Lemoine argues, should perhaps push us to think that we have asked the wrong question. Instead of looking for a definitive feature of all diseases, he proposes instead to ask "why it is necessary that organisms have diseases in general" (p. 41). Following the approach of evolutionary medicine, he proposes a fourfold answer to that question: mismatch, infection, disposability, and senescence, each phenomena that could have made disease, as a category, a product of selection.

In the book's final section, the author argues that shifting our focus in this way will let us build a theory of what he calls (following recent literature) "physiological health." Paralleling his approach to disease, he argues that the correct question to ask here concerns "why a certain state should be called 'healthy'" (p. 64) instead of being a theory of the concept "health" as it is used in physiology. His answer to this question involves a unique approach to the idea of homeostasis. Although cybernetics characterized it formally, as a maintenance of a certain variable by a feedback loop, Lemoine is interested in the "material homeostasis" understood as a "specific, optimized balance an organism can supposedly remain in indefinitely" (p. 56). Describing the particular processes that sustain this balance is crucial for medical research and practice.

This book simultaneously serves as a lucid introduction to questions surrounding health and disease and as a kind of "manifesto" for the kinds of research that the author describes in the second half of the work. The necessarily short length of the Cambridge Elements series makes this manifesto less detailed than one might like, although this limitation is understandable. If we were to offer two brief critiques, they would be these: the volume largely departs from human biomedical research, although its impact on other areas of zoology and ecology is clear; and Lemoine's explanatory arsenal, in dialogue as it is with evolutionary medicine, often focuses on natural selection to the exclusion of other potential causal paths. But these are minor critiques, lacunae that, we hope, will be rapidly filled by future research along the lines proposed here.

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

ANIMAL MODELS OF HUMAN DISEASE. *Cambridge Elements in the Philosophy of Biology.*

By Sara Green. Cambridge and New York: Cambridge University Press. $64.99 (hardcover); $22.00 (paper). iv + 81 p.; ill.; no index. ISBN: 978-1-009-50731-8 (hc); 978-1-009-01230-0 (pb). 2024.

This excellent addition to the Cambridge Elements series on philosophy of biology succinctly explores the place of animal models in translational biomedical research. Sara Green, an associate professor at the University of Copenhagen, insightfully guides readers through a well-selected set of philosophical issues ranging from the impacts of animal standardization to the possibilities of replacing animal models altogether. The result is an engaging and useful short book that will stimulate classroom discussion and further research in this area.

Animal Models of Human Disease is organized into five substantial sections. The first discusses how the relationship between animal models and their targets in humans is made and maintained. Here processes of model choice and model modification are introduced as means of finding or creating a model system that is going to make translation to a human system possible. In the next section, Green addresses the tension in research with animal models between standardization and variability. Although standardization of animal models can make reproducibility in the laboratory easier to achieve, it is typically traded off against applicability to a widely heterogeneous and variable target population. This concern dovetails with concerns about the widespread use of canonical model organisms that are often highly standardized and represent only a fraction of the biodiversity available for research. The use of nonmodel organisms, extreme model organisms, and negative model organisms are framed within this problem of standardization and representativeness of animal models.

Typically, the deployment of animal models as a means to research various aspects of human diseases involves a claim about how the animal model represents certain features of the human state. The author contrasts these uses of animal models with uses that are more instrumental and less representational. In these uses, animal models serve as tools or devices for specific tasks, such as drug dosage assays. In this capacity, animal models become a material resource for scientists for problems of detection rather than a representation of human disease.

Green also considers under what circumstances translational animal models can be considered to be surrogates for humans. Efforts to humanize animal systems represent one way of closing the gap between animal models and their human targets. Of course, such efforts raise serious ethical concerns about the moral status of humanized animals. The