

to those long-standing questions, how did they change the agenda, and how were they, for better or worse, conditioned by the context in which they found themselves? It is precisely this distinctive abstention from prejudging the lasting philosophical worth of the endeavors of the people discussed that is missing from the translation—and replaced by the noted comment in the preface and little presentational nudges. In its own way, the translated version of Sigmund's account of the Vienna Circle threatens to do what has become the office of A. J. Ayer's venerable *Language, Truth, and Logic*: spoil the prospects for an unprejudiced discussion of the intent and the potential of the Circle's philosophies. Thus, the disappointment: unlike the original, the translation immunizes readers against the idea that some of the Circle's philosophies may still be worth taking seriously.

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Scott Lidgard and Lynn K. Nyhart, eds. *Biological Individuality: Integrating Scientific, Philosophical, and Historical Perspectives*. Chicago: University of Chicago Press, 2017. Pp. 361. \$75.00 (cloth); \$25.00 (paper).

Biologists, historians of biology, and philosophers of biology often ask what is it to be an individual, really. This book does not answer that question. Instead, it answers a much more interesting one: How do biologists individuate individuals? In answering that question, the authors explore why biologists individuate individuals, in what ways, and for what purposes.

The cross-disciplinary, dialogical approach to answering metaphysical questions that is pursued in the volume may seem strange to metaphysicians who are not biologically focused, but it is adroitly achieved by the editors. Scott Lidgard (a paleontologist and marine ecologist) and Lynn K. Nyhart (a historian of biology) orchestrate a dialogue among historians of biology, philosophers of biology, and practicing biologists over 10 chapters. These are followed by three reflective commentaries written to frame the different disciplinary perspectives and to highlight the historical, biological, and philosophical themes across the chapters. The result is a volume—in structure and in content—that has much to be generously commended.

Biological individuality is a hotly discussed topic, but it is also part of a series of long-standing arguments within both the history and philosophy of biology (HPB) and metaphysics. Notable and fervent debates have centered on evolu-

tion and the units of selection, predominantly on Michael T. Ghiselin's and David L. Hull's notion of species as individuals, Peter Godfrey-Smith's Darwinian individuals, and Ellen Clarke's individuating mechanisms.¹ Lately, it has encompassed non-Darwinian individuals, symbiotic associations like Thomas Pradeu's immunological individuals, and John Dupré and Maureen A. O'Malley's metabolic individuals.² The present volume is curated in a way to introduce the reader to new research in HPB that articulates these debates as well as to introduce and engage in the study of further notions of biological individuality. But its aim is more than an introduction. As the subtitle suggests, it is also intended to give the reader insight into the working together of biologists, historians of biology, and philosophers of biology in figuring out how the notion of biological individuality is instantiated. As such, the problem-centered dialogue that results does more than talk through biological individuality. It shows how the different and often divergent goals of the authors' disciplines shape not only how they think about individuality but how they communicate this thinking in reciprocal collaboration with others in different disciplines.

Chapter 1 (Lidgard and Nyhart) structures the space of interdisciplinary discussion with a taxonomy of the various notions of biological individuality, the kinds of problems that questions of biological individuality identify, and the criteria used to identify biological individuals. The problem of biological individuality is framed in terms of four types of questions addressing the following topics: the properties of identity or unity of wholes (individuation), levels of organization (hierarchy), changes in part-whole relationships over time (temporality), and how parts structurally or functionally interact and integrate in ways that form compositional wholes (constitution). The chapter also includes a helpful and extensive table that lists around 24 sets of definitional criteria complete with references to 146 publications from 1800 to 2016 that define "biological individuals" or "organisms." Although admittedly incomplete, this will be a valuable resource for anyone interested in the historiography of the terms in use in HPB.

Chapters 2 (Matthew D. Herron) and 3 (Beckett Sterner) focus on individuality using the case of volvocine green algae. These discuss the possibility of

1. Michael T. Ghiselin, "A Radical Solution to the Species Problem," *Systematic Zoology* 23 (1974): 536–44; David L. Hull, "A Matter of Individuality," *Philosophy of Science* 45 (1978): 335–60; Peter Godfrey-Smith, *Darwinian Populations and Natural Selection* (Oxford: Oxford University Press, 2009); Ellen Clarke, "The Multiple Realizability of Biological Individuals," *Journal of Philosophy* 110 (2013): 413–35.

2. Thomas Pradeu, *The Limits of the Self: Immunology and Biological Identity* (Oxford: Oxford University Press, 2012); John Dupré and Maureen A. O'Malley, "Varieties of Living Things: Life at the Intersection of Lineage and Metabolism," *Philosophy and Theory in Biology* 1 (2009): e003.

degrees of individuality as well as different kinds of individuality that must be in use when trying to assess whether cells, aggregates, and clones are individuals. When, or at what stage, are volvocine algae individuals? How much are volvocine algae individuals? Herron relies on the former question, using the case of volvocine algae to discuss a new kind of individual whose identification does not fit the characterization of Darwinian individuals: populations that exhibit heritable variation or are capable of adaptive evolution (Godfrey-Smith, *Darwinian Populations*; Clarke, “Multiple Realizability”). But because heritable variation in fitness varies with the developmental level of organization, the individuality of volvocine algae is determined differently for the various levels of biological hierarchy, for example, cell, colony or clone. Sterner explores the causal structure of what has been recently referred to as the individual’s “individuation mechanisms” (Clarke, “Multiple Realizability”). Doing so, he provides an alternative way of identifying individuality that does not rely exclusively on fitness but instead on the material and causal structures that are responsible for the compositional state of its parts to the whole over its life cycle.

Historical investigations explore case studies with both philosophical and social impact. This is especially true of the next four chapters (Andrew S. Reynolds, Nyhart and Lidgard, Snait Gissis, Olivier Rieppel), which track how individuality as a concept has been used in both pre-Darwinian and post-Darwinian contexts with a focus on the process of individuation. Reynolds, drawing on Rosine Chandebois’s “Cell Sociology: A Way of Reconsidering the Current Concepts of Morphogenesis” (*Acta Biotheoretica* 25 [1976]: 71–102), investigates the “sociology of cells” and a notion of social agency—that a unity persists by virtue of a particular purpose. The metaphor permits exploration of the social and communicative aspects of cell populations and cell-cell interaction including programmed cell death. Investigating cells as communicating communities, he proposes a social approach to multicellularity that extends the ideas of socio-cell-biology of Ray Keller, Joan E. Strassman, and David C. Queller.

Gissis presents a nonstandard Spencerian view that takes individuality to be that process that is constituted by stable interactions with the environment over time. She adeptly shows how the process of individuating is not the same as our individuating practices. Gissis explores how Spencer’s approach was the result of conceiving of individuals and collectives that effectively transferred notions of individuality from social to biological and from biological to social. In another particularly engaging interdisciplinary discussion, Rieppel analyzes the notion of “synthetic anatomy” that was used to describe the whole in terms of nonreductive and holist features in the concept of *enkapsis* that held that an individual was understood in terms of a totality constructed in inclusive structural systems such that a body is “in its totality, in its being as an instantiation of form”

(Rieppel, 187, quoting Martin Heidenhain, “Über die teilungsfähigen Drüsenheiten oder Adenomen: Sowie über die Grundbegriffe der morphologischen Systemlehre Wilhelm Roux,” *Archiv für Entwicklungsmechanik* 49 [1921]: 1–178). Rieppel carefully articulates the central notion of the unity as exerting causal and formative control over the aggregation. He shows that *enkapsis* is philosophically interesting from the point of view of the question of biological individuality despite its being used to underpin Nazi ideas of the *völkisch* national community.

In the final three chapters before the commentaries, Michael A. Osborne, Hannah Landecker, and Ingo Brigandt discuss part-whole relationships and constitution. Osborne addresses problems of individuation through a case study of biomedical definitions in parasitology used in France and within the French colonies that emphasize not only biological but also (problematic) political uses of part-whole relationships. The meaning of the term “parasite” shifted from meaning a kind of solidarity and reciprocal adaptation of the parasite and host to a definition of parasite that implied that the parasite-host relationship was harmful to the host, especially when used to describe the marginalization of racial and ethnic communities. In one of the most interesting and conceptually provocative chapters, Landecker explores the relationship of eater to food. Whereas food is often thought of as the source of continuity (and life) to be ingested and metabolized by the eater, she suggests that the agency is not in the eater but in the eaten. The ingestion of symbionts can be the eating of cues that drive the eater’s development and growth rather than merely an energy source. Landecker considers how the notion of autonomy affects our understanding of biological individuality by reflecting on the changing agency of the metabolite from fuel source to a signal capable of controlling development and reproduction. In the final chapter, Brigandt addresses individuation in terms of the processes by which individuals are actually individuated—presenting what I took to be an innovative kind of mereology-in-practice. It opens up the classification of things considered individuatable to include not just products but also processes. In doing so, it sheds light on the ways in which we identify parts in the first place. Brigandt exemplifies a number of different ways organismal systems can be partitioned into parts on the basis of various classificatory and explanatory purposes. I am especially keen to see how he can extend this discussion, as it seems complementary to one I have explored in the articulation of kinds in terms of kinding activities. (See Catherine Kendig, “Homologizing as Kinding,” in *Natural Kinds and Classification in Scientific Practice*, ed. Catherine Kendig [Abingdon: Routledge, 2016].)

Three commentaries follow the research section. In these, James Elwick (history), Scott F. Gilbert (biology), and Alan C. Love and Brigandt (philosophy) consider biological individuality in the volume’s focus disciplinary contexts.

Elwick suggests envisioning history of biology as a dialogue between the persistent a priori notions of biological individuality and the empirical notions of biologists. Understanding how this dialogical space has been shaped is therefore key to understanding how conceptions of biological individuality have changed over time. Following Elwick's historical commentary is Gilbert's biological perspective. Gilbert surveys the research chapters and recommends a nuanced and timely extension to the notion of individuality that seeks to accommodate a multidimensional account of individuality. Relying on recent research on multispecies consortia and symbiont associations such as holobionts, he suggests that the identity of an individual may be determined on the basis of physiological, immunological, or ecological processes as well as Darwinian selection. In the final commentary, Love and Brigandt propose a practice-based account of philosophical investigation for biological individuality. They propose that the criteria for individuation are determined by the question being asked. Take, for instance, the question, What is a biological individual? That question is answerable only by first identifying the purpose and roles individuality plays in the investigator's activities of classifying, modeling, and explaining. In considering biological individuality in this way, the volume positions itself firmly within what has been widely discussed in HPB and HOPOS as the philosophy of science in practice. This is an approach to scientific metaphysics that adverts to being complementary to, rather than in opposition to, traditional metaphysics or other theory-first approaches to HPB (for a similar approach, see Kendig, *Natural Kinds*).

I conclude with a few notes on the structure of the volume that might help potential readers. Historians, philosophers, or biologists reading the volume may prefer to read the commentaries first and use these as guides to the conceptual terrain and as helpful signposts to the historical and philosophical connections between chapters rather than wait to see how it all sorts out in the end. That is at least what I would advise my students to do. Complaints are few. Each chapter includes lengthy conclusions that repeat the main points made in the text; commentaries also reiterate—in the course of their analysis—the key points of each chapter. Read as a whole, the reader might complain that the repetition is unnecessary. As a sourcebook to be read and returned to, the commentaries and conclusions are likely to be welcome reprises.

There is substantial conceptual agreement across chapters despite the diverse topics. The volume's contributors share a commitment to an epistemologically driven pluralism, and it is clear that they see questions of biological individuality as helpful heuristics that define a problem space in HPB. The result is that the individual chapters aim to speak to each other rather than over each other. That said, there remains an open question for some less biologically inclined metaphy-

sicians. When speaking of entities, processes, lineages, or symbioses, does talking about a “biological individual” do any metaphysical work that “individual” does not already do? Does biological individuality identify a different kind of thisness or haecceity distinct from the identity of individuals in general? If individuality always implies something about identity, unity, or mereological relationships, an ornery metaphysician might ask, What does the qualifier “biological” in “biological individuals” actually do for our metaphysics? As the explicit aim of the volume is to provide a conversation among the contributors that the reader can also participate in, I think the authors would welcome our ornery metaphysician into the dialogue.

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Christian Damböck. <Deutscher Empirismus>: *Studien zur Philosophie im deutschsprachigen Raum 1830–1930*. Dordrecht: Springer, 2016. Pp. 213. €80.00 (cloth); €63.00 (e-book).

With this book, the author, Christian Damböck, proposes an interesting and unique new reading of nineteenth-century German-language philosophy. Against the common belief that German-language academic philosophy came to a halt between 1830 and 1870 and was only revived later in the century, Damböck argues that, quite the contrary, that period saw the emergence of a promising (albeit today largely forgotten) philosophical tradition, which he dubs <German empiricism> and which was characterized by an affirmative reference to a specific version of psychology, which he calls <descriptive psychology>. Damböck uses angle brackets throughout the book to indicate that he is well aware that the terms in question (empiricism, descriptive psychology) already have established meanings. Thus, he uses these expressions in a specific, technical sense, explained and laid out in the book. His thesis is that the kind of psychology that is being referred to here is not the natural scientific one that other philosophers relate to, either positively or negatively, but should be described as a mode of psychology specific to the human sciences (*Geisteswissenschaften*). Damböck identifies Wilhelm Dilthey and Hermann Cohen as the main proponents of this tradition, with Moritz Lazarus and Heyman Steinthal as important early figures and the young Rudolf Carnap as a late representative.