

Chapter 4 addresses Frege's stance on various classical epistemological themes such as scepticism, the sources and definition of knowledge, and the notion of epistemic justification. Garavaso and Vassallo connect these themes to the notion of thinking, thus showing that thinking has in Frege an important epistemic dimension. Just to mention the first theme: Frege rejects the sceptical view that we cannot have knowledge of anything outside the range of our immediate experience by resorting to the objectivity and mind-independence of thoughts; by making us *grasp* thoughts, thinking allows us to gain knowledge of external reality. The authors' aim is not to show that Frege's epistemological views are successful, but more modestly to show (and they do so convincingly) that he "had wide ranging epistemological views" (64), something which has not always been appreciated by scholars.

Chapter 5 argues that for Frege "language plays a necessary epistemic role both in expressing thoughts and in directing thinking" (85); the former role is justified by Frege's idea that "[l]anguage plays a necessary function ... in representing and expressing thoughts in such a way that humans may be able to grasp them" (102), while the latter by the fact that *Das Denken*—in its diverse forms (logical, actual, etc.)—is tied in direct ways to the language employed in the process of thinking" (90).

The authors' interpretation of Frege is in my view balanced and largely correct, although also somewhat speculative in places (an example is their discussion of Frege's notion of 'reason' on pages 57 and 69); also, it could have occasionally benefited by further elaboration and discussion (for example when the authors attempt to reconcile Frege's context and compositionality principles on pages 100 to 101). While Frege's views on thinking are sometimes presented in a more clear-cut way than they appear in Frege's own texts, Garavaso and Vassallo succeed in bringing to light the importance that these often neglected views have in fundamental areas of Frege's philosophy. Because of this, *Frege on Thinking and Its Epistemic Significance* provides a valuable and much needed addition to the critical literature on Frege.

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### ***Aristotle's Physics: A Critical Guide***

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MARISKA LEUNISSEN, Ed.

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Mariska Leunissen recently published *Explanation and Teleology in Aristotle's Science of Nature* (2010). Aristotle's study of the natural world plays an important role in his philosophical thought. He was highly interested in notions such as motion, causation, place, time, and teleology, and his reflections on these concepts are collected in his *Physics*, a treatise of eight books. In this edited volume, Leunissen brings together research that takes into account recent changes in the field of Aristotelian studies. The volume does not focus on the history, unity, or structure of Aristotle's *Physics*. Rather, each of the chapters engages with recent changes in Aristotelian scholarship by either reassessing key concepts of Aristotle's natural philosophy, reconstructing Aristotle's methods for the study of nature, or determining the boundaries of Aristotle's natural philosophy.

There are 14 chapters in addition to the Introduction by Leunissen comprising this volume. In what follows, I will highlight some salient points from the chapters.

In reassessing key concepts of Aristotle's natural philosophy, in Chapters 2-7, various contributors discuss the notions of nature, chance, teleology, and art. In Chapters 8-13, other contributors revise the traditional understandings of Aristotle's notion of *kinesis*, which is variously translated as change, process, or motion. In reconstructing Aristotle's methods for the study of nature, several of the chapters work towards closing the gap in existing scholarship by offering interpretations of what it means according to Aristotle to investigate things *physikos*—i.e., in the manner of a natural scientist, how this method relates to other methods available to the philosopher, and how methodological concerns stemming from the *Posterior Analytics* drive the conversation in *Physics*. In determining the boundaries of Aristotle's natural philosophy, several of the chapters deal with Aristotle's ethics and metaphysics.

In the introduction, Leunissen notes that within the *Physics*, Aristotle investigates the principles and causes of all natural things in general and, in the course of doing so, defines a large number of key concepts of his philosophy. Moreover, therein he specifies his methodological guidelines for how one should study natural entities. In this way, Leunissen contends, Aristotle lays out his conceptual apparatus and methodological framework for all of his natural philosophy, including his psychology, biology, and other inquiries.

In Chapter 1, James Lennox addresses three methodological questions regarding the science of nature, arguing that Aristotle believes each scientific domain is governed by norms for inquiry that are specific for that individual domain, and not another. Sean Kelsey, in Chapter 2, addresses Aristotle's definition of nature in *Physics* II.1, tracing it through the rest of the *Physics*, where explicit mention of the concept is scarce. According to Kelsey, Aristotle's definition of nature functions as a kind of instruction for how to interpret the phenomena of nature. Chapter 3 also focuses on Aristotle's definition of nature in *Physics*, but Stasinos Stavrianeas herein provides an assessment of the content and meaning of Aristotle's definition of nature as used in *Physics*; Stavrianeas believes that Aristotle intentionally leaves the definition of nature vague and general in *Physics*, which would allow him to further specify it in later treatises. In Chapter 4, James Allen reinterprets Aristotle's notion of luck and spontaneity, which are both types of chance, in *Physics* II.4-6, by showing that chance is not an alternative to teleological explanations, but is an inevitable byproduct of final causes instead.

Margaret Scharle offers a new interpretation of Aristotle's rainfall example in *Physics* II.8 in Chapter 5, claiming that Aristotle sees winter rainfall as a natural phenomenon that is also teleological. Against standard readings that have downplayed the import of Aristotle's analogy between art and nature for his argument in favour of natural teleology, Charlotte Witt argues, in Chapter 6, that artifacts have intrinsic ends and proper functions just like natural beings. Robert Bolton, in Chapter 7, focuses on Aristotle's account for the origin of natural teleology noting that, for Aristotle, teleology is not—contra Plato—reducible to efficient causes.

In Chapter 9, Diana Quarantotto analyzes Aristotle's concepts of change and substantial being, noting that his conclusions are a major innovation over the Greek tradition of natural philosophy. David Charles, in Chapter 10, analyzes Aristotle's definition of process in *Physics* III.1-3 and what this definition entails, analyzes Aristotle's account of the individual processes in *Physics* III.3, and analyzes the nature and role of the concept of actuality in Aristotle's definitions of process. Leunissen makes her own

contribution in Chapter 12, noting what changes one undergoes when acquiring virtues of character, according to Aristotle; she notes that, in a way, *Physics* provides a physical ground for Aristotle's political science. In Chapter 13, Usula Coope notes how Aristotle characterizes self-movers as both being a part that produces the movement while being itself unmoved, and a part that is moved. Finally, in Chapter 14, Andrea Falcon argues that Aristotle's treatment of the unmoved mover does not go beyond the boundaries of natural philosophy, offering instead a single and extended natural scientific argument concerned with eternal motion.

All in all, one who has interests in Ancient philosophy generally, and Aristotelian philosophy in particular, cannot go wrong with the purchase and consumption of this title. It is a profitable read, as the contributors' insights into the enduring questions that the *Physics* addresses—i.e., nature, cause, change, time, and the 'infinite'—are still pertinent today. To understand the intellectual assumptions of a powerful worldview—and the roots of our own scientific revolution—reading Aristotle's *Physics* is critical. This critical guide enables one to understand the import of Aristotle's positions for today's environment.

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