Tony Roark
Aristotle on Time: A Study of the Physics.
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In his Introduction, Tony Roark rightly notes that *Aristotle on Time* 'combines two of the most philosophically exciting topics that there are: the nature of time and the philosophy of Aristotle' (3). The central thesis of the work is that for Aristotle, time is a certain type of hylomorphic compound. More specifically, motion underlies time as its matter, while perception is its form. Although Roark's interpretation is not as novel as he sometimes suggests—indeed it was the preferred reading of Aristotle's temporal theory among certain medieval philosophers—there is little doubt that Roark has infused the view with new life and added some philosophically insightful twists. There is likewise little doubt that students of Aristotle and of ancient philosophy will find much of worth in this short work, as will those with interests in the philosophy and history of temporal theories and natural philosophy more generally.

After a brief introduction, the work divides into four general parts. The first part, 'Times New and Old', considers a number of concepts that we today normally think any adequate theory of time must exemplify, for example, temporal extension, directionality, and simultaneity. To these concepts are added further ones that ancient temporal theorists considered important such as periodicity. Roark also provides the historical background to Aristotle's discussion of time, which includes ancient methods of timekeeping as well as a description of Plato's temporal theory as sketched in the *Timaeus*.

Arguably the richest section of Roark's work is part II, in which he discusses how motion provides the material conditions for time. For Aristotle, time cannot be motion, but it is closely linked to it. This position requires Roark to examine closely Aristotle's telic, that is, end-directed, conception of motion. Roark then uses his analysis of Aristotelian motion to explain how time is a number of motion with respect to *before and after* in such a way that the 'before and after' are not temporal notions (if they were, Aristotle's definition of time would be circular). Roark's general strategy is to make the "before and after" in Aristotle's definition a kinetic "before and after—what he terms a "kinetic cut" (loosely think of a moment within a motion). Next, he explains the priority among kinetic cuts, which he does thus: in a motion between locations A and B, an intermediate kinetic cut P_1 is *before* P_2 just in case P_1 is in the set of spatial points between A and P_2 but P_2 is not in the set of points between A and P_1. While the set-theoretic talk is foreign to Aristotle, one cannot help but think that Aristotle would happily embrace Roark's suggestion.

The book's next part, 'The Form of Time: Perception', is a bit of letdown after the heights of Roark's insightful discussion of motion as the matter of time. This is perhaps because he considers perception more *as such* rather than perception *as the form of time*. Still, Roark identifies and comments on a number of important discussions about time in Aristotle's psychological works. These range over such topics as perception and number, perceiving

instantaneous events, the place of imagination in perception as well as how time is a common perceptible.

The final section is a catchall. It includes a very interesting discussion of simultaneity in Aristotle's thought and the sense in which Aristotle accepts temporal passage as well as how Aristotle's conception of temporal passage avoids the paradoxes of an A-series account of time as developed by J. M. E. McTaggart, D. C. Williams, and Michael Dummett. This section also includes a very short (perhaps too short) resolution of the temporal puzzles that initiate Aristotle's discussion of time, which Aristotle infamously does not solve. Roark justifies his brevity by noting that once a clear understanding of Aristotle's theory of time is had, the puzzles can be seen for the sophistries that they are. The book ends with a brief indication of how Aristotle's temporal theory might be modified so as to be viable today.

A shortcoming of the work is that in developing his interpretation, Roark engages almost exclusively with a small handful of contemporary Aristotelian commentators, most notably Richard Sorabji (*Time, Creation, and the Continuum*, 1983) and Ursula Coope (*Time for Aristotle*, 2005), or, derivatively, with thinkers specifically treated in the works of these two. Consequently, Roark is unaware of the discussions by other commentators—ancient, medieval, and contemporary—who have advanced interpretations of Aristotle's theory of time that are also hylomorphic or at least are in the same spirit. Since readers of Roark's work might find the discussion of these other commentators of more than passing interest, I mention a few sources available in English here. First, arguably the most important ancient exegete of the *Physics*, at least for the medieval commentary tradition, was John Philoponus, a figure Roark does not consider. Philoponus's commentary on *Physics* IV.10–14 has recently come out in the Ancient Commentators on Aristotle Series (Bristol Classical Press, 2011).

Second, concerning the hylomorphic interpretation of time, the medieval Aristotelian, Avicenna, explicitly identifies motion with the material condition of time and maintains the need of a percipient mind in marking off time (*The Physics of* the Healing, II.10–13). Moses Maimonides, too, identifies time as a compound of an accidental form and motion in book II of *The Guide for the Perplexed*. Both of these figures in turn influenced Thomas Aquinas's commentary on Aristotle's *Physics* and his interpretation of the nature of time (see especially book IV, lectures 16–17).

Third, both Avicenna (*Physics*, II.1–3) and Aquinas (*Commentary on the* Physics, III, lect. 2) emphasize the end-directed nature of motion, as does Roark. Moreover, they specifically use motion's telic nature to determine the order and direction of time and then to respond to the charge that Aristotle's definition of time is circular (Avicenna, *Physics* II.11; Aquinas, *Commentary*, IV, lect. 17). More recently there is John Bowin's rich article, 'Aristotle on the Order and Direction of Time' (*Apeiron* 42 [2009]: 49–78).

Finally, the significance of perception, or at least of the need of a percipient mind, is central to William of Ockham's nominalist interpretation of Aristotle's temporal theory: see, for instance, Marilyn McCord Adams's *William Ockham* (Notre Dame Press, 1987) ch. 20, 'On Time.' Also, in 'Making Time Aristotle's Way' (*Apeiron* 36 [2003]: 143–69) I stress how

perception formally distinguishes time from other types of magnitudes, particularly in light of Aristotle's views about mathematical objects and his claim that time is a number.

Despite this lacuna in the scholarship, *Aristotle on Time* is an insightful work from which readers will certainly take away something valuable. Indeed, Roark has done a marked service by giving new life to a classical (even if forgotten) interpretation of Aristotle.

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