ABSTRACT
This paper examines how within De Caelo Aristotle argues that the heavens rotate to the right, because this is best. I isolate and evaluate its presuppositions and show how it comprises both a dialectical argument to cosmological principles and a partial demonstrative explanation on the basis of such principles. Second, I consider the expressions of epistemological hesitation that Aristotle offers in regard to this (and similar) arguments, and draw conclusions concerning the status of cosmology as an Aristotelian science. In order to “save the phenomena,” to allow the endoxon that the heavens are alive and divine to stand, Aristotle needs to make the point that the world and its doings, including all of our human doings, depend on an actuality that is in some sense better than the occasional, incomplete activities in which we engage.

I. Cosmological Circles

“For Plato too did well when he presented as a puzzle and investigated whether the way is from or to the principles, just as [if one were to ask whether the way] is from the judges to the finish line or in the other direction” (EN 1.4, 1095a32-b1). So Aristotle famously wrote, and he took his teacher’s words to heart when he distinguished two paths involved in scientific and philosophical reasoning. Demonstration, discussed in the Posterior Analytics, is the path from the principles; dialectic, discussed (at least in part) in the Topics, is at least part of the path to the principles. As has been often noted, the discussions offered in Aristotle’s lectures in the physical sciences are not clear cut examples of either of these. The consensus among scholars today is that they offer a little bit of both, and provide some dialectical arguments towards principles, often never attained (though Aristotle does seem to think that he often successfully grasps truths intermediate between first principles and the phainomena at which he starts) as well as some partial explanations, in which Aristotle shows how derivative facts are entailed by more causally basic ones, which explanations could in principle

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1 All translations are by the author.
be cast as part of those syllogistic chains that would qualify as completed demonstrations.\(^3\)

*De Caelo*, however, is somewhat problematic in this regard. The very first words of the treatise suggest that Aristotle’s arguments will form part of a natural science as he understands it,\(^4\) but there are a number of indications that what Aristotle arrives at falls short of this. This is especially evident in the case of a series of arguments found in *De Caelo* 2.2 and 5. These are to the effect that the rotation of the heavens is “to the right,” and that this is so because the right hand side is that which is better or more worthy of honor and it is fitting for a living, divine being to be moving from this side. (In regard to circular motion, the Greek phrases for “from the right” and “to the right” are synonymous, both referring to counterclockwise motion, which proceeds from the right hand side, as, at a banquet, one passes the goblet to one’s neighbor on the right with one’s right hand.)\(^5\) These arguments are especially notable for two reasons. First, they are on the face of it implausible holdovers from archaic modes of thought from which Aristotle has not wholly freed himself;\(^6\) and plagued by gaps in the argument and apparently unwarranted assumptions.\(^7\) Second, they, like several other

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\(^3\) See Lennox 1987 and Gotthelf 1987.

\(^4\) Ἡ περὶ φύσεως ἐπιστήμη σχεδόν ἢ πλείστη φαίνεται περὶ τε σώματα καὶ μεγέθη καὶ τὰ τούτων οὖσα πάθη καὶ τὰς κινήσεις, ἐπὶ δὲ περὶ τὰς ἀρχὰς, ὡςα τῆς τοιαύτης οὖσίας εἰσὶν (*Cael*. 1.1, 268a1-4). “On the whole the science of nature seems mostly concerned with bodies and magnitudes and their affections and motions, and, further, with all of the principles of such substance.” These lines pose a problem. For *APo*. 1.7 asserts that different sciences concern different kinds, for which reason different sciences rest on different principles. But physics, the science of natural substances, as discussed in *Phys.*, rests on principles different from those of the science of natural substances, as discussed in *Cael*. In *Phys.*, the science of nature is primarily concerned with form (as nature) but here it is said to be primarily concerned with body, of which the fundamental feature is magnitude. This issue is discussed by Lang 2009, who suggests that the principles of nature are both matter and form, and magnitude is a principle of matter, insofar as it provides it with limits, by which matter has the identity that it has. Hence *Phys.* and *Cael.* discuss different aspects of a unified science. Lang does not explain how magnitude serves to determine matter as *substrate* for form, which is the role matter plays in Aristotelian physics. An alternative way of solving the puzzle is to appeal to Aristotle’s thesis that locomotion is the primary variety of κινήσις (*Phys*. 8.7, 260a27-261a28). Magnitude is a principle of locomotion, as that which moves in space must be understood as traversing a continuous magnitude.

\(^5\) See *Cael*. 2.2, 285b19-20: Εἰ οὖν ἄρχεται ἀπὸ τῶν δεξιῶν καὶ ἐπὶ τὰ δεξιὰ περιφέρεται (“If then [the heavens] begin from the right and rotate to the right . . .”) On the meaning of “to the right” see Braunlich 1936.


\(^7\) It is for this reason that historians of philosophy and science sometimes avert their eyes from these chapters. See, for example, Solmsen 1960, which devotes two chapters to *Cael.*