The Principle of Plenitude: The various versions and the relevance to Hintikka, Broadie and Scott[1]

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This is the second "digital extension" to *Aristotle's "Not to Fear" Proof for the Necessary Eternality of the Universe* (New York: ExistencePS Press, 2019) and to the basic "Clarification" at:
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The Principle of Plenitude has been phrased in different ways, including the following:

1. "In infinite time, any possibility is actualized." (A.O. Lovejoy uses this version and scholars like Leibniz and Jonathan Barnes take this to mean any *conceptual* possibility, no matter how fantastical.)

2. Principle of Genuine Plenitude: "In infinite time, any *genuine* possibility is actualized." At times, Jaakko Hintikka suggests this version by stating that the possibilities involve actually existing things that could also satisfy the qualification "in infinite time." Given the *Dramatics aka Poetics*, in which the Northern Greek speaks of "possibility in accordance with necessity or probability" (9.1451a36-b33), I take "genuine" to mean "real" or "following laws of nature," whether or not infinite time is at play.

3. Principle of Sortal Plenitude: "In infinite time, any *sortal* possibility is actualized." ("Sortal" here is non-technical and is simply synonymous with "type [of possibility]" or "kind [of possibility].") This is a version that Hintikka suggests at other times, when he unpacks certain presuppositions on Aristotle's part: An individual that is the subject (or object) of "possibility" is being treated as a member of a kind (or sort) and possibilities apply to it insofar as they apply to similar things *having the same essential nature as that sort of thing*. Just as Aristotle has no concern with "accidents" in science (even though they clearly exist for him), so, I argue, he has no concern with "accidental properties" when applying the Principle of Plenitude.

4. Principle of Genuine Sortal Plenitude: "In infinite time, any *genuine sortal* possibility is actualized." This is sometimes implied by Hintikka, and I argue in *Aristotle's "Not to Fear" Proof* (espec. pp. 69-80), is the most sensible version of the Principle for Aristotle, with any other version being elliptical, *insofar as finite things are in scope*.

5. "If it is possible that *p*, then at some time it is the case that *p*." Sarah Broadie (writing as Waterlow) presents this version, preferring to call it A' instead so as not to perpetuate theological coloring (*Passage and Possibility*, 1982, page 1). It is not clear whether infinity of time is required in this precise formulation (whether or not Broadie herself ultimately

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> requires it). That is, does any speaker using this formulation suggest "at some time before any possible end of the universe," if the universe is not held to be eternal?
> 6. "What may be, will be." This is arguably just a shorter version of (5).
> 7. Aristotle's primary Principle of Plenitude: "For eternal things, what may be, is" (*Physics* III 4, 203b30).

Scholars have debated whether Aristotle holds the Principle in various formulations but (7) is undeniable. This seventh formulation might seem identical to the first version, because whatever lasts eternally will exist for infinite time, but there is a crucial difference. "In infinite time, any possibility is actualized" could be read elliptically, and has frequently been read elliptically, as "In infinite time, any possibility **regarding finite things** is actualized." The seventh formulation, though, is only concerned with infinitely-existing things.

As explained in *Aristotle's "Not to Fear" Proof,* Aristotle has different senses of the modals: possible (sometimes equivalent to potential), necessary, and impossible. This "triangular" modal model is temporal or ontological, given statements in *On Interpretation*, while another sense is the typically recognized "merely" logical one, as given, for instance, in *Metaphysics* V 5. The ontological sense of possibility means "contingent" (what exists at least once in an eternity); what always is, is necessary; and what never is, is impossible. (I owe this insight to Hintikka and Broadie; see pp. 16-8; 67-105.) Hence, eternal existence is necessary.

Once we see this and establish the equivalence of "infinity" and "eternality" (see pp. 175ff), we can establish for Aristotle that the universe is not contingent. In other words, given the seventh version of the Principle, if something has *not* happened in infinite time for an eternal thing, it could not have been possible (otherwise, by definition it would have occurred at least once). Thus, it is impossible.

All scholars to my knowledge accept that the past is infinite for the Northern Greek, although some have at least questioned this proposition (see pp. 23ff). Thus, for Aristotle it has been, and is, impossible for the universe to go out of existence (otherwise, it would have done so). Given some other claims by the Northern Greek—namely, that the universe cannot disappear completely and then re-appear *ex nihilo* (see pp. 172-4)—the universe always exists and must be necessary, in and of itself.

As a result, there is absolutely no need for (at least the mature) Aristotle to posit an Unmoved Mover to somehow guarantee the (eternal) motion of the universe, contrary to the claims of *Metaphysics* Lambda, in which the Mover is invoked to guarantee the (existence and) motion of the *contingent* universe.

However, as I also say on pp. 132-3, I also justify how Aristotle applies different versions of the Principle or different senses of "possibility" to other settings, with finite things as the scope. For example, he speaks of "kinds of possibility" in the famous passage of *On Interpretation* 9, following the discussion of the future sea battle (see pp. 142-154), and some of his remarks in the *Dramatics* pertaining to finite things or finite events also do not make sense if one does not recognize both "sorts of possibilities" and "genuine possibilities" (as opposed to merely conceptual or fictional possibilities). That is, Aristotle usually only cares about possibility *in accord with probability or necessity* (9.1451a36-b33), which helps show that he despises mere conceptual or fictional possibility, even in the context of ("musical") drama like tragedy and even though he understands perfectly well that composers of epic sometimes accept this notion (stemming from Parmenides); see pp. 84-5. Insofar as a version of the Principle of Plenitude would be applicable here, it would therefore be (at least implicitly) the version of *genuine sortal* Plenitude.

In short, recognizing the Principle of Plenitude in its variety of forms is absolutely crucial for best understanding Aristotle's philosophy, and the subsequent treatments of the Principle by other thinkers may be fascinating topics in their own right but their views should not necessarily be foisted on the ancient Northern Greek.

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Edited 1/27/23: Added "of" to p. 3, 2nd paragraph; added "recognizing" to p. 3, final paragraph.
Edited 3/30/23: Changed on p. 2:
"One sense is temporal or ontological and given the conversions presented in the *Prior Analytics* and in *Metaphysics* Theta 8 by the Northern Greek, with possibility meaning "contingent" (what exists at least once in an eternity), this entails that what always is, is necessary, and what never is, is impossible."
           to
"This "triangular" modal model is temporal or ontological, given statements in *On Interpretation*, while another sense is the typically recognized "merely" logical one, as given, for instance, in *Metaphysics* V 5. The ontological sense of possibility means "contingent" (what exists at least once in an eternity); what always is, is necessary; and what never is, is impossible."

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