The Ambiguity of "Possible" in Aristotle's Unmoved Mover *aka* God

The Stagirite's Triangular Modal Model, not a Modern Modal Square, and the Ramifications for the "Not to Fear" Proof[1]

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Stemming from Naomi Reshotko's "From the Cosmology of the *Timaeus,* through the Metaphysics of *Anankē*, to the Epistemology of the Forms" at the conference in honor of Sarah Broadie, Marquette University, February 2020, this is the fourth "digital extension" to *Aristotle's "Not to Fear" Proof for the Necessary Eternality of the Universe* (2019).

I realized even more the ambiguity of "possible" and its relevance to *Aristotle's "Not to Fear" Proof* during discussions of possibility *qua* contingency, necessity and infinity in Plato's *Timaeus* that followed Reshotko's presentation.

For the sake of clarity, I separate here two related but mostly independent discussions and start with the following, which disambiguates "possibility" and "necessity." In the forthcoming, fifth digital extension, anticipated in September 2020, I reply to three objections to the ultimate conclusion of the "Not to Fear" Proof, namely, that because the physical universe for the mature Northern Greek from Stagira is eternal *and necessary*, he has no need of the Unmoved Mover and simply drops it in his late ontology. That "entity," or rather "imaginative construct," I have argued, was only required for him in his early career at the Academy, when, I submit, he wrote Lambda 6 and when he was first providing an alternative to Plato's Divine Craftsman. That is, the physical universe for him at that stage of his career was eternal *but contingent*; the universe *could* go out of existence even if for whatever reason it never does. The eternality is not guaranteed.

In this extension, I explain how "possible (*qua* contingent)" in Lambda may well have a sense that is connected to the Platonic senses of "contingency" and "necessity" that Reshotko employs in her own presentation (similar to a conceptual-logical sense that modern philosophers and especially logicians seemingly accept), whereas in Aristotle's mature doctrine "possible (*qua* contingent)" has a different, "ontological" sense. Let us start with some background.

The Equivocal Nature of "Possible" and "Necessary" in the Corpus, and Aristotle's Triangular Modal Model

In *Prior Analytics* 1.3, Aristotle recognizes three senses of "possible": "…possibility is said in several ways (*pollachōs legetai to endechesthai*), for we call the necessary, the not necessary, and

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[1] Published on 8/11/2020 at www.EPSpress.com/NTF/AmbiguityLambda.pdf. I am extremely grateful for helpful feedback on earlier drafts by Sarah Broadie, who, as the body of the text shows further, has been an inspiration for over 25 years. Naturally, any remaining problems are my responsibility alone.

the potential possible (25a37-39)."[2]

On Interpretation 12, 22a10-12, confirms that "possible and not possible" and "impossible and not impossible" are the relevant pairs of opposites, *not*, as may be represented in a modern modal square, "possible and *impossible*."

Regarding "contingency," Broadie states:

> In *Prior Analytics* 1.13, 32a18-20 Aristotle writes: 'I say that the *possible* (*tò ἐndechómenon*) is that which is not necessary, but which, if we suppose it the case, has no impossible consequences" [and she adds] "what the sentence just quoted explicates is **'possible' in the sense of 'contingent', i.e. 'neither necessary nor impossible'."**[3]

I should remind the reader that there is no Greek term for "contingency" apart from "possibility" (usually *tò ἐndechómenon* or *dunatos*). One must determine the exact sense of the term from the behavior in a passage or argument, of which more in a moment. I should also emphasize that any disagreement I have with Broadie is insignificant compared to our commonalities, especially considering how I have been influenced by her work. Indeed, *Aristotle's "Not to Fear" Proof* is dedicated to her,[4] and in this passage, I agree emphatically with her.

The "ontological sense" of "possible *qua* contingent," entailed arguably from the passage in the *Prior Analytics* above and accepted by the highly respected Finnish-American logician Jaakko Hintikka (at least roughly), Broadie, Jeroen van Rijen[5] and myself, is explained in my book and in the previous digital extensions: "happening at least once in all eternity, finitely." For the Northern Greek, if X *never* exists, it is impossible, and if X *always* exists, it is necessary. The only remaining option *in the context of the modalities* is for X to exist finitely. He therefore has for these (ontological) modals a simple and yet very powerful triangular model, not a modern modal square such as, apparently, Saul Kripke's "weak logic **K**," involving "possible," "necessary" and their respective negations:

Necessary [= omnitemporal/eternal/*always* existing]

Possible (*qua* contingent) [=existing at least once, finitely]

Impossible [=*never* existing in eternity]

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[2] Transl. Richard Patterson, *Aristotle's Modal Logic: Essence and Entailment in the Organon* (Cambridge: Cambridge University Press, 1995) p. 256.

[3] Sarah Broadie (publishing as "Waterlow"), *Passage and Possibility: A Study of Aristotle's Modal Concepts*, Oxford: Oxford University Press, 1982, p. 16; my boldfacing.

[4] Another reason that the book is dedicated to her is that she sponsored my position as a Visiting Research Fellow at Princeton University, Philosophy, from 1995-1997, and showed me by example how a superb scholar and wonderful human being thinks and acts.

[5] Jeroen van Rijen, *Aspects of Aristotle's Logic of Modalities* (Dordrecht/Boston/London: Kluwer Academic Publishers) 1989.

Alternatively, one can view Aristotle as following Platonic-type division:

Necessary/<u>not necessary</u>
|
Possible (*qua* contingent)/<u>not possible</u>
|
Impossible/not impossible

Broadie's characterization of contingency in the *Prior Analytics* is completely consistent with the triangular model. Indeed, her characterization presents only three options or "points of the triangle" very clearly, not four options that at least some modern logicians seem to prefer.[6] Moreover, right after that passage of 1.13 a18-20, Aristotle adds: "We say, indeed, homonymously, of the necessary that it is possible,"[7] which hearkens back to the passage in 1.3 in which he says possibility has three senses: *necessary*, not necessary and potential.

I take an example of possibility that is homonymous with necessity to be the following: Even though it is *necessary* that all human beings die, we often say something like "Greg *might* die." However, "Greg might die" (which is obviously just a shorter version of "it is possible Greg will die") cannot properly be used if possibility is *ontological* contingency, which, like potentiality in this context, *has both options open: "to be" or "not to be."* Necessity and impossibility always have one and only one option, respectively, in the ontological sense. "Greg might sit" is proper, because he might *not* sit, lazy individual that he is, always lying down. However, with the sense of possibility *qua* contingency it is foolish to say "Greg might die," *because one thereby suggests he might not die*. Ah, were that the case, as long as Greg could stay youthful!

The case with individuals *possibly* dying, then, is possibility *aligned* with necessity, and people often do not understand what they are advocating if they consider possibility to be contingency in this case. However, I would argue, and in effect argue in the book, that they *do not* consider it, because, again, Aristotle in general has no separate term for contingency apart from possibility, and readers simply do not consider that he at times uses contingency as "not necessary" rather than "in accord with necessity" or as "possibility qua potential." Now, "Greg might die *tomorrow at 4pm in front of the firing squad*" is a very different story. Then the negative option is open, too, because, obviously, he might receive a reprieve and die in his sleep at 90 in the middle of a very pleasant dream. The temporally-indexed statement can indeed involve ontological possibility.

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[6] This is not to say that in her book Broadie intends to offer support for the triangular modal model. Indeed, just the opposite: At the Marquette conference, she said that she thinks Aristotle follows a modern modal square. However, that was before she heard of the triangular model, and after querying her about whether she believes now that Aristotle had (only) one modal model (always) or, depending on the context, more than one, and which ones they were, she indicates "I think more than one, but am not an expert on all the texts." In my view, this is an open area for future investigation, especially because there are many models of modern modal logics, and it would be interesting if one of them could be shown to match Aristotle's approach.

[7] Transl. A.J. Jenkinson, in J. Barnes, *The Complete Works of Aristotle*, Princeton: Princeton Univ. Pr., 1985, first printing 1984.

That the triangular model of the modalities is upheld by Aristotle is shown right after he acknowledges that possibility and necessity can be homonymous: He presents the correct way of viewing the matter (where possibility and necessity are *not* homonymous and where the contradictory negations of the correct formulations are described). He gives the three options, *and only the three options*: possible/not possible, impossible/not impossible, and necessary/not necessary. Again, possible has *its* negation and impossible has *its own* negation (as does necessary), which shows yet again that he is not working with some kind of modal square,—maybe a hexagon, but, as footnoted, I leave that option for the specialists in logic.

If all of this were not enough, the Northern Greek also recognizes merely conceptual possibilities that arguably arise from Parmenides, if not before, in the *Dramatics aka Poetics*, for instance at 25.1460b11ff. More on this later, but for the moment I nevertheless contend that Aristotle himself *almost always* places more importance on the *kind* of possibility that is "in accordance with probability or necessity," even in the domain of fictional and theatrical creation, what we might call "real" or "genuine" possibility. One reference is 9.1451a35-6, but the emphasis on "probability and necessity" is emphasized so frequently throughout the treatise (in part because plots are more believable if a composer creates in accordance with necessity or probability) that I hardly need cite other passages. This kind of possibility seemingly maps most easily to the first "way" in the *Analytics*.

Finally, Aristotle gives five different senses of "necessary" in *Metaphysics* V 5:

1. That which a thing needs to live (e.g., respiration or food);
2. That which a good or end needs to be achieved (what arguably he calls "hypothetical necessity" in other treatises, which is contrasted with "absolute necessity" that is manifested in eternal phenomena[8]);
3. That which is compulsory or which binds something (and, as he indicates, this sense goes back at least to Sophocles, aligning with the sense that Reshotko attributes to Plato, as I discuss later);
4. That which cannot be otherwise (which the Stagirite thinks is the most basic sense, from which all the other senses are derived);
5. That which demonstrates (because the conclusion *cannot be otherwise*); hence "logical necessity."

However, immediately after these senses, he concludes with a statement that is very important for the themes of my book and its digital extensions (especially the upcoming, fifth one):

> Now, some things owe their necessity to something *other than themselves*; *others do not*... If, then, there are *certain eternal and unmovable things* [and we should note the plural], *nothing* compulsory or *against their nature attaches to them*."[9]

These five senses, by the way, do not exhaust the different senses of "necessity" for the Northern Greek. I discuss ones mentioned elsewhere in my pp. 16-20. Finally, given some sort of inherent

8 *Parts of Animals* I 1, 639b24-640a11; see my p. 16-7.

9 1015b1-9; transl. W.D. Ross, in J. Barnes, *The Complete Works*, *op. cit.*; my italics.

relation of "necessary" to "possible" found in any domain of discourse, a change in the notion of "necessary" will typically affect the corresponding notion of "possible," even if that correspondence is not explicitly made by Aristotle.

In short, it can hardly be denied that the modal terms are very equivocal in the Aristotelian corpus, even recognizing that one is most basic for him (i.e., the fourth sense of "necessary" in *Metaphysics* V 5). We will explore here and to a lesser extent in the next digital extension what I had not considered or explicitly made clear in my book, namely, that Aristotle in Lambda is using "necessary" (or "must" as the equivalent verb) in the 3rd sense above ("compulsory" or "bound") or in the 5th sense ("the result of logical deduction"), with the sense of possibility adjusting accordingly. We will see that, in either case, my conclusions are not affected whatsoever and, in some ways, even strengthened: The Northern Greek drops the doctrine of the Unmoved Mover by about mid-career and relies instead on the "Not to Fear" Proof for the *necessary* eternality of the world.

One final note reflecting that additional complications could arise: The form of a sentence does not always or necessarily determine whether "possibility" (however precisely construed), "necessity" or "impossibility" is implied, or, indeed, whether any modal is implied to begin with. For example, the reader might say that when Aristotle makes an assertoric statement, "x is y," rather than an apodeictic statement ("x must be y") or a statement of possibility ("x might be y"), we are therefore in the realm of assertoric versus modal logic. This, although perhaps true at times, evades difficulties in some contexts (and I say "perhaps" because I give reasons why Aristotle only had one logic, not two "distinct" logics; pp. 204ff). "2 plus 2 is 5" is assertoric. However, leaving aside the truth or falsity of the statement, we legitimately ask whether the reality underlying the claim or any opposing claim is necessary, impossible or contingent. Obviously, it is necessary that two 2's are 4 and impossible that two 2's are 5, given the meanings of the terms. ***Given the ontological senses, it is not even possible qua contingent that 2+2=4***! For Aristotle, the statement "two 2's are 4," or better yet the reality, is *necessary*, not because it is true (it may be, and in this case, is that also) but because *always* 2 things plus another 2 of those things are 4, not 5, of those things. Even crows can determine that two 2's are 4, notwithstanding that they have no word "four" (at least that we understand) and even though their calculations appear limited to five or six percepts maximum, as experiments in cognitive science have revealed. "Alex is swimming" or "Nick is breathing" could also be claimed to be necessary or possible, depending on the context. I gather the first is possible but "Nick breathes [to live]" could convey Aristotle's first sense of necessity in *Metaphysics* V 5. What, though, about "the universe is infinite"? Does it represent a necessary or possible reality (especially possible *qua* contingent)? I have shown (in the book) that for at least the mature Northern Greek the reality is (only) necessary if the ontological senses of the modals are used; otherwise, the reality could only be possible if "possible" is homonymous with "necessary." In brief, in and of itself, the form "x is y" sometimes masks necessity, possibility or impossibility; one must examine and understand the terms and not consider the form absolutely definitive. For an extensive and perhaps similar approach to this kind of thinking, although with a much more technical analysis of formal modal logic, see the

aforementioned book by Patterson, even if he would not agree with everything or even anything I say.[10]

Setting the Immediate Context: Ontological versus Conceptual Possibility, according to Hintikka, Broadie, Barnes (and myself)

In the 1950's to at least the 1970's, Jaakko Hintikka recognized the importance of kinds, whether of possibility or of the subjects/objects of possibilities, even though he completely ignores the *Dramatics* in his various publications to my knowledge. For example, he attempts to resolve the problem in *On Interpretation* 9 of the cloak that has the possibility of being cut but that never gets cut because it is destroyed first. Resolving the problem of the cloak is crucial for the renowned Finnish-American because he was the first to champion that Aristotle accepts (a variation of) the Principle of Plenitude, that is, "in infinite time, what may be, will be" (other versions of the Principle are clarified in my book and in a previous digital extension with the relevant URL given here at the end).[11] How can the Stagirite uphold the Principle if he gives an obvious counter-example?

Hintikka suggests that, in this context, proper or *genuine* possibility for the Stagirite applies to *kinds*, like kinds of cloaks, and to things that empirically can be shown to exist. Thus, even if one particular cloak is burned to a crisp before it is cut, nevertheless future cloaks *as a class*, and by implication clothing in general, will always have the ability to be cut. Thus, the Principle of Plenitude, properly qualified with, or applied to, "kinds" (when finite things are in scope), is indeed held by the Northern Greek. In that case, though, the Principle in my opinion is better labelled *The Principle of Sortal Plenitude* or *The Principle of Genuine Sortal Plenitude* to distinguish it from the Principle that Aristotle explicitly gives at *Physics* III 4, 203b30, which has *eternal* things as its scope: "For eternal things, what may be is."

I support Hintikka's arguments in part by showing that for Aristotle not only our biological species but kinds like artifacts and any activity or possibility *that (properly) derive from the essential nature of either the species or the class of (human-made) products* are eternal. Examples are walking, talking, singing, dancing, and creating art and artifacts, including clothing that can be cut.[12] The possibilities are latently eternal insofar as they are potential, not actual, realizations at each and every moment but, to reiterate, *when* realized, are finite (and they must be realized at least once in all eternity, otherwise they are impossible).

Broadie argues against Hintikka in her *Passage and Possibility,*[13] claiming that the possibilities should apply to individuals—and not just kinds—with examples given from *De Caelo* I. In my

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[10] I discuss his views on pp. 101-3; 109-10, 112-119; and 205. Leaving aside the chronology, he sometimes supports my own views and sometimes not.

[11] For Hintikka accepting at least at times the version of the Principle just formulated, which was coined by Arthur Lovejoy in 1936 in *The Great Chain of Being,* see my pp. 69ff. Hintikka correctly rejects Lovejoy, who argued that Aristotle does *not* accept the Principle.

[12] See, e.g., *Dramatics* 4 1448b1-22 and *Physics* II 8, 199a19-24; cf. my pp. 155-66.

[13] *Op. cit.*, pp. 55-6; cf. my pp. 124ff.

book, I attempt to reconcile the two scholars and argue that they are both correct: Indeed, individuals are at play in *De Caelo* but they are *implicitly* considered by Aristotle to be individuals *of a species or of a kind*.[14] They are not being considered examples of a *tode ti*, a "this," like Callias.

Jonathan Barnes, in discussing Hintikka and the Principle of Plenitude (as Barnes himself and Leibniz formulate it), offers an example of mere conceptual possibility, even though Barnes does not explicitly qualify "possibility" as "conceptual." In fact, because he does not qualify possibility, he shows how "possibility *qua* contingency" is just assumed to be only a conceptual or "logical" notion of possibility for most modern scholars, even those who are superb specialists of ancient Greek philosophy and of Aristotle (whether "conceptual" and "logical" are the same in this context or whether, strictly speaking, "logical" is a subset of "conceptual," or whether they are different, with perhaps some overlap). The relevant example Barnes offers is "leaves floating up and re-attaching themselves to twigs."[15] I offer another: Dogs sprouting wings, flying to the moon and back and laying moonrocks at your feet because you gave them extra treats this morning. I would call this mere "conceptual possibility" or mere "to-be-or-not-to-be" possibility because there is no reasonable expectation that the "to-be" side will ever occur. Again, this kind of thinking is recognized in the *Dramatics* but arguably *not* in Shakespeare's famous speech by Hamlet, because there the topic of "to be or not to be" is suicide and, sadly, the "to-be" side occurs too often in life.

Merely conceptual possibilities, however, from my perspective go at cross-purposes to Hintikka's concerns because the Finnish-American ultimately really only cares about Aristotelian genuine (or ontological) possibilities. However, to return to a topic already broached, an example of a *seemingly* genuine possibility with which I argue Aristotle is also *not* concerned in this context is a real-life *accidental* particular, e.g., Alex, our modern-day Callias, swimming or walking or sitting. This is another way in which I attempt to reconcile Broadie and Hintikka: Just as Aristotle does not believe in accidents (or accidental particulars) being the subjects or objects of *epistēmē* ("understanding" or "scientific knowledge"; *Metaphysics* VI 2, 1026b2-3), his ontological possibilities on my view are also not pertinent to mere accidents or to individuals *qua* accidental particulars. He is concerned with *epistēmē* even when employing contingency (which Hintikka

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[14] See my pp.75-6 and 121. It is impossible for me to summarize here the differences between Broadie's interpretation of the Finnish-American and my perhaps slightly different interpretation, as I discuss in the book. Even less can I, then, summarize the resulting solutions to the cloak that is destroyed before it is cut, how this example impacts the legitimacy and interpretation of the Principle of Plenitude and what the example reveals about the assumptions that Hintikka and Broadie each seem to require for the Principle to be held by Aristotle. Except for eternal objects, there can be no question that Aristotle must have had *some* presuppositions for "what may be, is." Otherwise, the Principle would be utterly preposterous on everyone's account, and the unwillingness to ascertain the exact assumptions is in my view why no one until Hintikka and Broadie (to their great credit) considered that Aristotle championed the Principle apart from eternal things; on these points, see my 124-41. Broadie, though, uses the label *A′*, so there is no theological coloring (*Passage and Possibility,* p. 14; cf. also my p. 106).

[15] Jonathan Barnes, "The principle of plenitude," in *Method and Metaphysics: Essays in Ancient Philosophy I*, ed. by Maddalena Bonelli (Oxford: Clarendon Press) 2011, pp. 364-70; see also pp. 183-91 of *Aristotle's "Not to Fear" Proof,* and for the source of "possibility as (mere) conceivability" in David Hume and others back to Parmenides, see pp. 19, 83, and 94-5. I myself would usually include "logical" under "conceptual" because logic is the determination of valid forms of reasoning, and one can use any terms, even purely fictional ones, in, e.g., a syllogism: All minotaurs are creatures spawned from magic incantations over stinky fluids; Malcolm is a minotaur; thus, Malcolm is a creature spawned from magic incantations over stinky fluids.

may agree with, given his own concern for Aristotle's emphasis on genuine kinds, but I recall no passage in which the Finnish-American states this). Call any possibility that pertains to an accidental particular an "accidental possibility," if you wish, but this type of possibility will get no more airtime in the rest of my own work.

To reiterate, it is the species (or class) that is eternal when we deal with finite individuals, and, I argue, it is the species that is the subject of appropriate possibility for Aristotle, at least in ontological settings and at least in his later career. It is only insofar as Alex is considered a *member of the species* "human being" that he has the kind of (ontological) contingency now under consideration (swimming or walking or sitting or living or existing), which will have a beginning and end.

Furthermore, to return to a topic introduced above: The "not swimming" or "not walking" or "not sitting" or any other relevant "not-to-be" contingency does not have a start (especially after any "to-be" part of its associated contingency finishes) *and then afterwards unendingness ad infinitum*. The reason for Aristotle is that there will be other members of the same species in the future who, again, swim or walk or sit or live (recall the previous discussion of cloaks). As Broadie arguably presents the crux of the matter for the Stagirite at the end of *Passage and Possibility* (p. 154): "…the instantiation of a species *even for a limited period* entails the necessity at all time that it be always instantiated [her own italics]." For Aristotle, species or (genuine) kinds do not exist in the abstract, and they are eternal. Hence, for example, no worry exists for him about which came first, the chicken or the egg, because there was never a first of either kind; actually, it is doubtful that they are two different kinds because the egg is an egg *of a chicken*. (No thinker to my knowledge seems to care about the reverse, about which would be last, the chicken or the egg, but, given the above, the Northern Greek would simply shrug off the question.) The kinds exist through their individual members who have essential properties that permit in the case of *homo sapiens* (the possibility of) swimming, walking, sitting, dancing, and so forth.

Having explained in the section "Aristotle's Senses of 'Possibility'" (pp. 81ff), different notions of the term—namely, conceivability, believability (which, as found in the *Dramatics* has more psychological force than mere conceivability), contingency, and so forth—I too hastily assumed that readers of my book would understand that when I say in Part 2 the eternal universe *in Lambda* is (temporally) contingent, I only mean that, at the most, it is *conceptually* possible. Again, because there is no special Greek word distinguishing "possibility" from "contingency," I meant, and mean, that in Lambda the eternal universe for Aristotle is "possible" *in the sense of conceivable or in the sense that is* ***homonymous*** *with necessary*. The universe could not be *ontologically* contingent because Aristotle would be immediately and absurdly advancing a contradiction: The universe would then be (temporally) finite *while being eternal*, itself the equivalent of "necessary" in Aristotle's later ontology, if not in Lambda. Aristotle simply could not have been so stupid as to accept that x, in this case the (eternal) physical universe, is both (ontologically) contingent and (ontologically) necessary. Again, simply look at the three options of the triangular model of the modalities. (Ontological) necessity does *not* imply (ontological) possibility, whereas for many modern thinkers and logicians (general) necessity *does* imply (general) possibility.

I take up this issue again below but one question that immediately arises is "What sense of 'necessary' *does* Aristotle use in Lambda, if not the ontological one?". This takes us to the next section and whether, as alluded to, he might be using "necessary" in the third or fifth sense of *Metaphysics* V 5.

Plato, Reshotko, and the Modalities in Lambda

Consider what Reshotko says in her presentation, with ultimate conclusions pertaining to the *Timaeus* that strike me as original and correct but that are far beyond the concerns of this digital extension:

> For example, the Forms of Snow and Cold will end up having a certain irrevocable relation to one another: ***one that we might describe as 'necessary' because it cannot change, but one that is equally describable as 'contingent' because there is no analyzable logic to it***. … The Demiurge comes to know the law-like connection between these two Forms by noticing that he can only superimpose Snow on areas of the Receptacle where the geometrical configuration is already conducive to Cold. We, as ordinary human beings—or philosophers—can only come to know of this law-like relationship (if we can come to know it at all) empirically; by realizing that we never find snow that isn't cold.
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> ***This brute reality could merit our term 'contingent'*** even though it predates our (or even, the Demiurge's) interaction with it. There is no formal or efficient or other explanation for why the world found by the Demiurge is the way it is, has the components that it does, or why those components fit together the way they do. The world did not have to contain Forms or perceptibles. ***The laws that govern the Demiurge's 'found world' are contingent in the same way that that the laws of physics might be regarded as contingent in our present day.*** We hypothesize that they are ***unchanging truths*** for which there is no coherent account for why and how they came to be in the specific configuration that they did (if they indeed did come to be). [In a footnote, Reshotko here adds: "Regarding them as necessitated and explained by the "Big Bang" seems unhelpful as we would have to attribute that to some pre-cosmic laws that either do or don't continue and that, in turn, has us asking ***whether those laws are contingent or necessary***."] However, we must take them into account as we attempt to manipulate intelligently the world that is governed by them.[16]
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> …
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> The laws of physics and even the laws of logic and mathematics seem to be *ananke*[17] in the way Plato describes here, while being neither necessary nor

[16] I am obliged to a scholar from the conference who in private correspondence relates this to a current practice that (from my perspective) continues to reveal the rich ambiguity or complexity of the modals: She notes "some people would say today they [the laws] are synthetically necessary."

[17] Of *ananke*, Reshotko says: "I conclude that the Greek word '*ananke*,' at *Tm* 47e is not well translated by any of our logical notions of the English word 'necessity'. *Ananke* bespeaks constraints that are brute and objective truths about relationships among the Forms. *They are, at least analogous to, contingent relationships that must be discovered empirically and not through logical analysis* (p. 4; my italics)."

There seems to be a long tradition for Reshotko's view. I add the following, drawing on comments Alexander Mourelatos offered at the conference in which Reshotko's paper was read: See Francis

> contingent. [In a footnote to this final sentence, Reshotko says: "Perhaps this can be captured by saying that *ananke* creates hypothetical necessities, but neither is a *de re* necessity nor creates them. That is, it might be case that *given* our natural laws it is necessary that life forms contain carbon. But it is neither a *de re* necessity that life forms contain carbon—***if all the other laws of nature had been some other way, some other element might have stood out as the major component of living creatures***. Nor is it necessary at all (and certainly not a *de re* necessity) that there is carbon or that there is life."]
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> This is the impact of this cosmological reading of the second beginning of the *Timaeus* on Plato's metaphysics and epistemology (pp. 15-19; her italics but my bold-italics).

Reshotko's use of "contingency" is typical and, as one of the notions of (possibility *qua*) contingency, perfectly allowable. She explains the term and has every right to use it that way. Indeed, no one at the conference (at least in the ensuing question-and-answer period) considered Reshotko's usage unusual, nor do I, insofar as it captures a typical Platonic or primarily conceptual/logical (rather than ontological) perspective. Her sense of "necessary" (*ananke*) as "constrained" seems also very fitting and is in accord with Aristotle's own third sense, as "compulsory" or "bound." As noted, this sense goes back according to the Northern Greek to (at least) Sophocles; hence, it would be very probable that Plato could be employing it.

I should add that the ease of the audience of specialists in ancient Greek philosophy at Marquette accepting Reshotko's usage attests to the remarkable recognition by Hintikka and Broadie of Aristotle's ontological sense of contingency. Aristotle, at least at some stage of his life or in some domains of thought (or both), is different from Plato and from modern views when it comes to the "contingency" of natural laws. Broadie's view that for Aristotle the species are eternal—*and thus that there is always a certain nature for them*—is absolutely correct. As I therefore interpret the texts, for him and for eternal things (and eternal species) the necessity *and* the eternality at some

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Macdonald Cornford, *Plato's Cosmology* (London, 1937), pp. 161-177 and 361-271. Cf. A. P. D. Mourelatos, *The Route of Parmenides* (1970 and 2008), which refers in this connection (pp. 27-28) to the concept-study by Heinz Schrekenberg, *Ananke: Untersuchungen zur Geschichte des Wortgebrauchs* (Munich, 1964). Moreover, at *Route,* pp. 277-78, Mourelatos points to difficulties in translating such Greek modals as *chrē* or *chreōn esti* with "it is necessary." For yet more recent discussion of the latter issue, see Mourelatos, "Two Neo-Analytic Approaches to Parmenides' Metaphysical-Cosmological Poem," in *Rhizomata* 4 (2016), 257-268.

On Reshotko's point about contingencies that must be discovered empirically: The aforementioned scholar (from footnote 16) also reminds me of "Kripke's point that we discover empirically that water is H2O even though this is true in all possible worlds [and] (he holds) hence necessary." I myself, though, am utterly befuddled by the notion of "all possible worlds," and so do not take a stance on Kripke, who seems to have mixed feelings about the notion of "possible words," or on related proponents of "possible worlds," including David Lewis, who seems to take the possible worlds as real, going back perhaps to Leibniz. I show in my book (pp. 182-93) that Leibniz himself had an absurd reading of the Principle of Plenitude, relying on *conceptual* possibility, or, to be more precise, that he sets up a straw-man interpretation in order to knock it down. In my view, there are so many "conceptual possibilities" and thus "possible worlds," which presumably include counterfactual ones (but need not), that we could *never* get halfway through them, much less ¾ of the way through them, much less 7/8, and much less "all" of them. Thus basing "necessity" on "*all* possible worlds" is arguably a very unhelpful, misguided approach. Rather, Aristotle was right in the *Dramatics* to proceed in reverse and base (the best notion of) possibility on "necessity or probability." (Along with, for instance, van Rijen, I also argue that necessity has priority in the logical treatises; pp. 104-5, espec. footnote 41.)

point in his career is recognized by him *not* to have an alternative; otherwise it would have occurred *because of the infinite past*. That is, the (primary) Principle of Plenitude—"For eternal things, what may be is"—ensures that the eternal species always had carbon, infinitely to the past. It *could not have been* any other way, nor *could* it be any other way; otherwise, it would either be different now or would have been finite at some point to the past, which, for other reasons given in my book, is not feasible given Aristotle's ontology, cosmology and biology, with the universe not able to vanish and a new, and especially similar one, to re-appear later *ex nihilo*. Hence, carbon for the Northern Greek could *not* be an ontologically *contingent* aspect of human life; it truly is ontologically necessary (that is, *always* entailed by, or required for, human nature).

I trust this example alone suffices to reveal the variance concerning possibility and necessity between (i) Hintikka, Broadie, van Rijen, and myself and (ii) "Platonic" others, who employ notions of possibility and necessity that are more conceptual (or logical) than ontological, at least when Aristotle assumes the sense of contingency explained above from the *Prior Analytics* that is *opposed* to both necessity and impossibility.[18] However, during and after the discussions at Marquette and as mentioned earlier, I realized even more fully that, because of the many different senses of the modal terms for Aristotle, interlocutors and potential readers of my book might be legitimately puzzled when I make claims about the universe being contingent for the Stagirite, whether in Lambda or elsewhere. Hence, the need to clarify this topic further here.

Some Ramifications

On my interpretation of the texts, Aristotle in his younger professional years probably had a notion of possibility that was influenced by Plato's *Timaeus*, in which the universe was *created yet infinite*. Possibility at that stage for the Northern Greek was something like "conceptual contingency": merely "to be or not to be," along the lines that Reshotko gives, or "logical possibility," following the fifth notion of (logical) necessity in *Metaphysics* V 5. It is not at all clear, at least to me, whether possibility is homonymous or not homonymous with necessity, and given the senses found in the *Prior Analytics* and *Dramatics,* it could be any of these, as far as I can tell.

Moreover, necessity (and impossibility) may have had also merely conceptual or logical meanings for Aristotle at this stage in his career, not the ones found in the triangular model. Again, note the five different senses of necessity in the *Metaphysics,* which, as noted, do not exhaust the senses of necessity for the Stagirite. (I offer no claims whatsoever on Plato's own view of any of the senses of possibility, contingency and necessity and am happy for at least the moment to follow Reshotko.)

In effect, Aristotle could have been hoisting Plato on his own petard, and, if so, was *thus committed to using (modal) terms in the same way*, otherwise he would be arguing at cross-purposes: The Unmoved Mover of Pure Actuality, sometimes called God and identified with the

[18] As alluded to above, these types of thinkers include Hume, who are not typically considered Platonic, but who accept the primacy, or at least great importance, of merely conceptual notions of possibility; see my pp. 94-7.

Nous of Lambda that thinks of itself thinking, is Aristotle's initial, youthful attempt to progress beyond Plato's doctrine of the Demiurge and its own created but infinite universe, because by *allegedly* having no physicality of any kind (and thus no potentiality of any kind whatsoever), the Mover has no ability to *not* exist. How could a Platonist object, when Platonists accept Forms that are completely non-physical and therefore indestructible?[19]

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[19] In a difficult-to-find article that was recommended by a participant at the conference, Philip Merlan asserts after a very close examination of the Greek texts (in "Aristotle's Unmoved Movers," *Traditio* Vol. 4, 1946, pp. 1-30) that "…in Aristotle's mind, the problem of the unmoved movers was closely bound up with certain views held, according to Aristotle, by Plato and the Academy and, in particular, with their conception of Ideal Numbers… (p. 2) and "…it is obvious from his own words [especially in Lambda 8] that Aristotle's teaching regarding the plurality and the number of the movers was by him meant to be an improvement on…the views current among Platonists with respect to the plurality and number of ideal numbers" (p. 7, with my comment in brackets).

In brief, Merlan contends that Lambda was a reply to Plato, exactly my point, although Merlan ignores how the Unmoved Mover could be the neo-Divine Craftsman and focusses instead on the 47 unmoved movers of Lambda 8 being an improvement on Plato's theory of ideal numbers. Although I can accept Merlan's conclusion in *this* regard (because Aristotle might be replying to Plato on *both* counts), it would be stunning in my opinion that the Stagirite was still writing in depth about problems in Plato's ontology any time after the 350's. Indeed, as a precocious 25-year old (around 358-359), he would have been more than capable of critiquing his master's views, even if he did it very tactfully, especially by writing his own theories without criticizing Plato by name. One example of this, although the treatise is usually considered much later than the 350's, when Aristotle, it should be emphasized, would not have to worry about offending his master personally, is the ranking of serious drama (*tragōidia*) over epic in *Dramatics* 26, in which Plato is not mentioned. Nevertheless, it is clear that the Stagirite disagrees with his mentor, who had explicitly favored epic in multiple treatises, e.g., *Laws* II 658d-659a and *Republic* III, 397d (cf. my *A Primer on Aristotle's DRAMATICS*, 2019, pp. 224ff). Obviously, at other times, the Northern Greek does mention Plato's name to disagree with him, such as in Lambda 8, but clearly we should not assume that he always highlights explicitly his disagreement with his mentor.

Another factor lends support to my claim that Aristotle would not be focusing after the 350's on the types of ontological problems in Plato that Merlan addresses, a factor related to the precocious student often being absent from Plato's lectures, as reported by Carlo Natali (*Aristotle: His Life and School*, ed. by D.S. Hutchinson, Princeton: Princeton University Press, 2013, with some of the entertaining ancient sources that also reflect Plato's wit but that are best read in the context of Natali's fuller discussion):

> Aristotle is said to have frequently walked out on the discussions in the school to be by himself reading books, and Plato found nothing to laugh at in that, though he tried courteously to involve the solitary young man in the school discussions. Every so often it is suggested, most recently by Düring…that the young Aristotle who is a character in Plato's *Parmenides* might be a portrayal of the historic Aristotle (p. 20).

It stands to reason that the Stagirite was not only reading but writing and that at least parts of Lambda, and especially Chapter 6 (and, for Merlan, Chapter 8), could well have been written in the 350's at the latest.

Finally, while on the topic of how the Stagirite advances, or tries to advance, the ontology of his "master," Merlan discusses (on p. 27) soul and movers but completely misses the import of *Phaedrus* 245c-e. For somebody explaining the difference between the (mature) Plato and the (mature) Aristotle, this omission is in my opinion baffling. For it is in this passage (the focus of my upcoming sixth digital extension, with the origin of the main ideas in Alcmeon of Croton) that one arguably finds an evolved Platonic ontology pertaining to the self-moving divine soul, one that is eternal, in contrast to the Northern Greek's final ontology, in which the *physical universe itself* is eternal and necessary, with the outer spheres having the same function as Plato's divine soul, but in virtue of their own nature. However, the outer spheres do not have an *animate* soul, because they cannot stop themselves and reverse course, as besouled animals could, although this leaves open the question whether they might have a non-animate soul (see my pp. 203 and 245-6).

Friedrich Solmsen missed all of this in believing that the Unmoved Mover of Lambda 6 was created very late in Aristotle's life and in saying: "Unlike the Platonic world soul which is defined as always moving, Aristotle's prime mover is eternally unmoved" (*Aristotle's System of the Physical World: A Comparison*

Another way of putting this is that, in Lambda 6, Aristotle's conception of the relationship of the physical universe to the Unmoved Mover is, roughly if not perfectly, the mirror image of Plato's "*created* by a Divine Craftsman but *infinite*." That is, indubitably for the Northern Greek, the physical universe is infinite to the past. However, because of its dependence on the Unmoved Mover for motion (of which more later), it is *destructible*, even if the present and future *happens* to show that it never gets destroyed. We might ask whether the Mover *could* theoretically choose to divorce itself from the universe, even if it does not. One reason is that, on Aristotle's account, it has no potential to choose, which means it has not even the power that an embittered married couple has. (So much for the magnificence of the Mover.) However, this inability to choose is not an issue of the theoretical nature *of the physical universe* at this stage of Aristotle's thought and whether the universe is possible or necessary; it is an issue of the nature of the Unmoved Mover. In the next digital extension, I consider the reverse: Could the physical universe choose to divorce itself from the Unmoved Mover?

All of this is related to the question whether, when Lambda 6 was written, (temporal) "one-sided infinities" that are finite on one end and infinite on the other are "possible," and, if so, in what sense: In accordance with "necessary" or not? Given the considerations outlined above and given that "possibility" could hold for Aristotle for the physical universe in a way that Plato held or that is *in accordance with* "necessary," an Aristotelian-type Divine Craftsman like the Unmoved Mover *could* end the universe but for whatever reason never does, in the analogous manner that the Craftsman could end the perceptible universe but, according to Timeaus, would not because it is considered well-designed according to the Craftsman. As Timaeus adds, only an evil being would undo what was well-designed and fine (*Timaeus* 41b).[20] In short, the Stagirite could have used "possibility *qua* contingency" in the way Plato/Reshotko does, and, indeed, even a specialist who has recently examined Theta in detail, Jonathan Beere, accepts that Aristotle allows the eternal universe to be destructible in what I and many others consider a later or latest book of the *Metaphysics* (Theta), even if the universe is *never* actually destroyed![21]

Arguably, Aristotle does not arrive at his theory that one-sided (temporal) infinities are either implausible or impossible until *De Caelo* I 10-12, and, in my opinion, it was not until that treatise that Aristotle truly refutes, if only by implication, the Divine Craftsman *creating* a (perceptible)

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with his Predecessors, Cornell Studies in Classical Philology, Vol. XXXIII, Ithaca: Cornell University Press, 1960, p. 229; see my pp. 13, footnote 8, and 245). Rather, the "prime mover" or "prime movers" for the mature Stagirite, I have argued, include the outer spheres that themselves are eternally moving and causing motion in the inner spheres and that are "unmoved" only from the standpoint of understanding or because, following Werner Jaeger, they are not moved by anything else or are not moved "incidentally."

I evaluate Merlan's article much more in the fifth digital extension, so proceed now to other topics.

[20] I discuss further in the fifth digital extension whether, since the Unmoved Mover as God would not care about the physical universe and its inhabitants (to the dismay of Cicero), for reasons given to some extent already in my book and previous digital extensions, the physical universe itself eventually out of "metaphysical despair" for being rejected eon after eon could quit loving the Unmoved Mover and therefore quit moving (and thus quits existing as "nature," whose basic principle is motion). In other words, we might ask: Why does the universe not commit metaphysical suicide?

[21] Jonathan Beere, *Doing and Being: An Interpretation of Aristotle's* Metaphysics *Theta*, Oxford: Oxford University Press, 2009, espec. p. 316; see my pp. 257-265, espec. 264-5, for why I reject Beere's position.

universe that lasts *infinitely* from that point onwards. At least this is what I have argued, and, I submit, *De Caelo* was written *after* Lambda 6 (see my pp. 223-8).

To obviate potential confusion, I should add that even this timeline of the development of Aristotle's thought does *not* demonstrate in my view that the universe for the Northern Greek is both eternal *and* necessary in the ontological senses of *both* terms in *De Caelo*. The necessity there may be only logical: "*It* ***must*** *be the case tha*t X is **eternal**" is different from "*It* ***must*** *be the case that* X is **eternal and necessary**," a variation of which is "*It is* ***possible*** *that* X is **eternal and necessary**." One reason, I claim, that *De Caelo* is not proposing "necessary" as an attribute of the subject, namely, a *de re* necessity that comes after the *de dicto* phrase ("it *must* be the case that") is that the Stagirite always states his conclusions in *De Caelo* I and II as the universe being (merely) eternal. He never makes an assertion about *necessity* being an attribute of the universe, just as he never makes an explicit assertion of necessity in Lambda as a *de re* attribute for *the whole physical universe*. Hence, it is very doubtful, at least for me, that Aristotle has identified "necessity" with "omnitemporality" in *De Caelo*, the ontological meaning, and arguably it is only in Theta 8 that we explicitly see that most mature model (1050b6-28). Stephen Makin astutely recognizes this to some extent in his book *Aristotle Metaphysics Book Theta*, *translated with an Introduction and Commentary*.[22] That is, Makin states that the model in Chapter 8 is different from the previous model(s) of possibility, necessity and potentiality as found in the earlier chapters of Theta (p. 268). However, he never leverages his commendable insights with respect to our issues, meaning he never applies them to the issues of *De Caelo* or of the Unmoved Mover in Lambda 6.

Another reason that the physical universe is not necessary *in the ontological sense* in Lambda 6 is that the universe is comprised of substances like planets (and animals and plants) that have matter, and all enmattered things have potential, including always the potential to not exist, at least on traditional readings of the Stagirite's corpus. If the universe, like a team of soccer players, is by implication enmattered, it is also destructible were all parts to be destroyed (just as the *team* is destroyed if all of its members, namely, players, coaching staff and investors perish in a tragic plane crash). Thus, one reasonable sense of "necessary" in Lambda is the Platonic sense (of "constrained"), again, Aristotle's third sense of V 5; however, "constrained" does not imply eternality or omnitemporality, as any jailed inmate would confirm. Another reasonable sense of "necessary" is the fifth, "logical" sense, as covered more in the next digital extension.

Conversely, another reason that the universe in Lambda 6 is contingent *in a conceptual sense* (that is, "possible" in the sense of merely conceivable) is *implied* by Aristotle's statement in Chapter 8: "the unmovable substances and principles may reasonably be taken as just so many [47/49 or 55]; **the assertion of *necessity* must be left to more powerful thinkers**."[23]

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[22] Stephen Makin, *Aristotle Metaphysics Book Theta*, *translated with an Introduction and Commentary,* Oxford: Clarendon Press, 2006, pp. 215- 6; cf. my pp. 267-77.

[23] 1074a16-7; tr. by W.D. Ross; *his* italics but my bolding. I believe that the "more powerful thinkers" came to include Aristotle himself as gained age and experience, if only concerning the universe as a whole and leaving aside the exact number of unmovable substances, especially because he explains the necessity in Theta 8 (1050b6-28). The Greek text in Lambda 8 is unclear on the exact number of unmoved movers: Merlan reads 47; Barnes 49; other ways of calculating give 55. My issues would apply if there were only 2,

Even though the concern with necessity seems to apply here only to the number of unmovable substances, still, the Northern Greek is never similarly concerned *explicitly* with the *necessity* of the (infinite) universe in Lambda (and, unless one wishes to accept Merlan's view of the "polytheistic" Aristotle, it is extremely odd that these "unmoved movers" have matter whereas the Unmoved Mover of Pure Actuality of Chapter 6 does not). Why would the Stagirite be concerned explicitly with the *necessity* of the number of unmoved movers and not explicitly with the *necessity* of the eternal existence of the physical universe as a whole? This lack of explicitness must make us wonder why he did not address the topic, and if he did not address the topic, it is imperative, it seems to me, for anyone arguing for the necessity of the physical universe itself to provide the textual grounds. I myself can think of one path only: The (explicit) necessity *of the Unmoved Mover* in Chapter 6 somehow guarantees for the Stagirite the necessity of the universe itself, but I have already addressed this topic in great detail in my first digital extension and touch upon it more in the next digital extension.

Summary and Upcoming Digital Extension

No good reason exists to think that Aristotle was holding the ontological senses (of the triangular model) of "possibility (*qua* contingency)" and "necessity" in Lambda and especially in Lambda 6, pertaining to the Unmoved Mover of Pure Actuality. He may well have been using the senses that Reshotko ascribes to Plato and, to underscore, Aristotle notes himself in *Metaphysics* V 5 the Platonic meaning as exemplified by Sophocles. To reiterate, if he were implicitly advancing beyond Plato (especially following Merlan, for whom at least one part of the advance, the argument in Lambda 8, is actually explicitly countering Plato), then he should use terms in the same way, otherwise, he is arguing at cross-purposes.

To make the dramatist even more relevant, Aristotle may well have been using a sense of possibility that was alluded to above, in *Dramatics* 25, as something that epic composers are allowed to use, not because an event is probable, necessary or true, *but merely because people* ***say*** *it*. That is, to return to the examples from before when discussing Barnes and his usage of possibility and to add another: We can verbalize a scenario, like (i) leaves re-attaching themselves to twigs or (ii) a dog bringing us back moonrocks or (iii) Athena intervening to save both Iphigenia and Orestes in *Iphigenia in Tauris*, but that in no way means the scenario is *ontologically* possible. To repeat, the younger Stagirite on my view had not yet formulated his triangular, ontological model at the time he composed Lambda 6, and how ironically subtle and sophisticated that very powerful and yet simple model is can easily be seen from its lack of recognition by generations of Aristotelian logicians, until Hintikka and then Broadie began to broach the matter (but even then, as shown at Marquette, the triangular model was unrecognized by Broadie, whether or not she now accepts it as one of Aristotle's legitimate models).

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so I do not enter this debate. Also, the necessity that the Stagirite mentions is probably only a logical necessity, not an ontological one: He mentions the "assertion," not a *de re* attribute of a subject, and even though the assertion could be *of* a *de re* necessity, it would be odd that he does not just use a *de re* formulation, e.g., "that the movers are necessary should be left to more powerful thinkers."

All of this takes us more into the considerations that I examine in the fifth digital extension, but, following the practice of dramatic series pausing at the moment the plot has an interesting twist, and with a tip of the hat to Aristotle's citation of Sophocles, I postpone the deeper discussion of these, and related, issues until that new extension.

To whet hopefully, though, the reader's appetite more, let me offer a hint of what will be covered.

As mentioned at the beginning, I examine and respond to three objections (given in private correspondence) to my conclusion that, because Aristotle considers by mid-career the physical universe to be eternal and ontologically necessary, he silently drops the Unmoved Mover of Lambda 6.

I also explain more how the Northern Greek, if he is not using in Lambda the third sense of necessity from *Metaphysics* V 5, merely deduces logically the nature of the Unmoved Mover of Pure Actuality to achieve his youthful goal of providing an alternative to the *Timaeus*. There is no empirical evidence for such an imaginative entity as the Mover, and thus we might fairly say that Aristotle deduces the Mover the way he would have deduced the following conclusion, which we discover later has no real referents in the syllogism: All angels are asexual; Mauricio is an angel; therefore, Mauricio is asexual.

This might also apply to the Unmoved Mover of *Physics* VIII, which I will also examine to some extent, but in any event, my examination shows that "necessity" in Lambda at the worst for my interpretation is merely logical, pertaining to deductions, *not* ontological. That is, "necessity" gets employed in Aristotle's fifth sense from *Metaphysics* V 5 (a lot of "5's" here, which is a handy mnemonic for recalling the crux of the issue). To put this in related terms: The Stagirite merely defines the Unmoved Mover the way he wants or needs for the argument (against Plato especially), but, as we will see given his own epistemology, mere definition in and of itself is no conclusive evidence that something exists.

Finally, to return to an aforementioned topic, it need not follow that, simply because the Unmoved Mover is necessary, the physical universe also is. How does the "necessity" of the Mover guarantee the *ontological* necessity of the physical universe? This returns us at times to the issue of necessity versus contingency examined above and, more importantly, to the Stagirite's analogy of the lover (the physical universe) and the beloved (the Mover), examined in my first digital extension. We will again see, though from a new perspective, how preposterous the analogy is and how easily anyone in the Academy and Lyceum, and anyone in the subsequent schools of philosophy, could have demolished it,—and why no one for hundreds of years ever chose even to contest such an important doctrine! Since I cover this topic in detail in my book and in great detail in the first digital extension (cited right below), I merely summarize the views in order to present some new thoughts inspired by the discussions from the conference at Marquette and from our new understandings above, on "metaphysical divorce (or metaphysical suicide)."

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Forthcoming (5th digital extension):
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Revisions
8/13/20, Footnote 19:
"when he, it should be emphasized" to "when Aristotle, it should be emphasized"

8/24/20, page 3:
"people" changed to "individuals"

1/4/22, p. 12, ft. 19:
tragoidos-> *tragōidia*