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RH: Aristotle on the Problem of First Principles

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Aristotle's Platonic Response to the Problem of First Principles

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Abstract: Aristotle is clear that first principles are not to be established by demonstration, but much less clear about how else we might come to understand them. A series of striking parallels between his *Topics* and Plato's *Parmenides* and *Sophist* show that Aristotle was familiar with a distinct Platonic method developed for this very purpose. The method does not provide a demonstrative guarantee, but it does offer a synoptic view of the consequences for each of an exclusive and exhaustive set of candidate principles. I argue that Aristotle not only recognizes this method and its application to the problem of first principles in the *Topics*, but also employs a version of the method when discussing first principles in his *Metaphysics*. Furthermore, I show how, despite appearances to the contrary, this method complements what Aristotle has to say about first principles in the *Analytics*.

Keywords: Aristotle, dialectic, first principles, *Topics*, *Analytics*, Plato, *Parmenides*, *Sophist*

How does one inquire into the truth of first principles? Where does one begin when deciding where to begin? Aristotle recognizes a series of difficulties when it comes to understanding the starting points of a scientific or philosophical system, and contemporary scholars have encountered their own difficulties in understanding Aristotle's response. I will argue that Aristotle was aware of a Platonic solution that can help us uncover his own attitude towards the problem.

Aristotle's central problem with first principles arises from the fact that they cannot be demonstrated in the same way as other propositions. Since demonstrations proceed from prior and better-known principles, if the principles themselves were in need of demonstration there would be a vicious regress: the principles of each 'higher' demonstration would then be in need of demonstration as well (*Met.* Γ4, 1006a5–9; *APo.* I.3). And even if the regress were not a vicious one, they would not be genuine first principles if other principles were prior to them (*APo.* I.2).

It is controversial where, if anywhere in the Aristotelian corpus, we are to find Aristotle's answer to this problem. Some have looked to *Posterior Analytics* II.19 where Aristotle gives a few clues. While first principles do need to be better known (γνωριμώτερα) than what is demonstrated on their basis, the type of knowledge we have of first principles is not the same. We acquire scientific knowledge (ἐπιστήμη) through demonstration, but we have a superior type of understanding (νοῦς) of first principles. Yet this pushes the question back one step further: how exactly does this understanding come about? Is it by mere intuition, or is there some other philosophical skill that will help? Others have looked elsewhere in the *Analytics* or in the *Topics* for Aristotle's answer. But this raises a further problem: since Aristotle appears to be talking about different methods in each case, syllogistic and dialectic respectively, how are the two to be reconciled? What is Aristotle's considered view on the proper argumentative tools for coming to know first principles?

In this paper, I will focus on some intriguing evidence from the *Topics* that suggests that there is indeed a philosophical method beyond mere intuition that can lead us towards the principles. Aristotle shows familiarity with a method that Plato developed in response to similar problems and employs a version of it in his own inquiry. Thus, it is closely related to Platonic and Aristotelian dialectic more broadly, but is a unique application to the problem of first principles. The central insight will be that understanding first principles involves not only seeing how the principles in question explain what they need to explain, but also seeing why other candidate principles cannot adequately do this job. It is a method with both syllogistic and

dialectical elements that, while most explicitly described in the *Topics*, complements the discussion of the *Analytcs* as well.

The method I have in mind I will call ‘exploring both sides.’ It involves identifying an exclusive and exhaustive set of candidate principles (the simple case being two contradictories) and considering each with an eye towards which one obtains. Plato introduces the method most explicitly in the *Parmenides*, where he has the character Parmenides recommend positing a hypothesis, exploring the consequences, then exploring the consequences of the contradictory hypothesis as well (135d7–136a2). Parmenides then gives a lengthy display of this very method, exploring the consequences of both the hypothesis ‘there is one’ and ‘there is not one’ in turn (136e5–166c5). The method does not provide a demonstrative guarantee, but it does offer a synoptic view of the reasons for going with one over another. Vassilis Karasmanis has recently argued that Plato develops this method specifically for testing first principles.<sup>1</sup> This method is distinct from Plato’s canonical ‘method of hypothesis’ from the *Meno*, *Phaedo*, and *Republic*: that method essentially involves the “vertical” step of positing a higher hypothesis from which the thesis in question can be derived. When it comes to first principles, however, there is nowhere higher “up” to go; instead, the “horizontal” step of looking to the contradictory is more appropriate. I will argue that Aristotle recognizes a similar application of exploring both sides that helps resolve the puzzles about understanding first principles.

As described above, any application of exploring both sides will involve:

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- (a) a set of what are at least taken to be<sup>2</sup> exclusive and exhaustive alternatives
- (b) an independent consideration of each alternative
- (c) an aim of seeing which alternative obtains

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In the best-case scenario one side will have positive consequences while the other has negative or problematic ones; it is then clear that we should accept the former and reject the latter. For example, in the *Sophist*, the Eleatic Visitor sets out three exclusive and exhaustive alternatives: either all kinds combine with one another, no kinds combine, or some do and others do not (251c8–e7). The interlocutors go on to find serious problems with the first two alternatives but positive results from the third that resolve their previous difficulties.<sup>3</sup> The method can also be used in an aporetic context for encouraging further inquiry, as happens in the *Parmenides*. Parmenides raises several serious problems for Socrates' theory of forms in the first half of the dialogue; Socrates is about ready to give up until Parmenides shows that there are also serious problems for someone who *denies* the existence of forms (135b5–c2). The dialogue ends with another *aporia* for Parmenides' thesis 'there is one' to similar effect.

The method is particularly useful for discussing first principles. When dealing with such principles there are no prior theses from which to derive them deductively. Therefore, beyond just looking at the consequences of a given candidate principle, it is useful to look to its alternatives and see whether those can positively be ruled out. I will argue that Aristotle is aware of this method along with its usefulness for discussing first principles in the *Topics* and that this insight complements his discussion of syllogistic in the *Analytics*. I will also suggest that the *Metaphysics* supplies at least one clear example of a work where Aristotle himself employs the method with his own adjustments. Both Plato and Aristotle realize the importance of comprehensively understanding the explanatory virtues of the correct principles and the explanatory shortcomings of the incorrect ones. Yet where Plato requires repeated application of this method for an extensive set of candidate principles, Aristotle uses the same methodology on claims *about* the principles to narrow down those candidates in the first place.

## 1. Platonic Parallels in *Topics* VIII.14

The parallels between what Aristotle says in *Topics* VIII.14 and what Plato recommends at *Parmenides* 135d7–136a2 are striking. A survey of these parallels will suggest that, at the very least, Aristotle was aware of this aspect of Plato’s method. In light of even further parallels in *Topics* I.2, I will suggest that Aristotle recognized not only the structure of exploring both sides but also its usefulness for testing first principles.

Aristotle begins this final chapter of the *Topics* by recommending several strategies for practice in dialectical argumentation. He suggests converting arguments (that is, negating the conclusion of an argument and using it to prove the negation of one of the initial premises), setting out attacks both for a thesis and for its contradictory, and examining different lines of attack for each one. He then adds the following:

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And for accurate recognition and philosophic wisdom, the ability to comprehensively see, or to have comprehensively seen, what follows from each hypothesis is no small tool; for it remains to choose one of the two correctly. (*Top.* 163b9–12)<sup>4</sup>

πρός τε γνῶσιν καὶ τὴν κατὰ φιλοσοφίαν φρόνησιν τὸ δύνασθαι συνορᾶν καὶ συνεωρακέναι τὰ ἀφ’ ἑκατέρας συμβαίνοντα τῆς ὑποθέσεως οὐ μικρὸν ὄργανον· λοιπὸν γὰρ τούτων ὀρθῶς ἐλέσθαι θάτερον.

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This is immediately reminiscent of the recommendation of exploring both sides in the *Parmenides*. The language is strikingly similar. Aristotle describes looking to the consequences of each hypothesis using the same words for ‘consequences’ (συμβαίνοντα) and ‘hypothesis’ (ὑπόθεσις) as Plato in his recommendation “to examine the consequences of the hypothesis when hypothesizing if each thing is, but also to hypothesize if the same thing is not” (*Parmenides* 135e9–136a2).<sup>5</sup> Both passages clearly invoke philosophy,<sup>6</sup> and emphasize the importance of the

task at hand.<sup>7</sup> Furthermore, Aristotle uses a word that evokes the Platonic context when he describes the ability to “comprehensively see” (συνοράω) the consequences on either side.<sup>8</sup>

Plato suggests that this type of comprehensive vision is a requirement for prospective philosophers; they need to make systematic connections among the different types of study as well as the underlying realities. He has Socrates summarize the point as follows: “the one who can comprehensively see is dialectical, the one who cannot isn’t” (*Republic* VII, 537c7).

Aristotle consistently uses this same verb to indicate the same type of comprehensive vision in other passages. He uses it at the end of the *Nicomachean Ethics* to refer to the understanding that will result from a comprehensive survey of different political systems (referring, of course, to the *Politics*).<sup>9</sup> He also uses the verb to describe what can be seen or inferred based on a large number of observations of specific cases<sup>10</sup> or even *all* cases.<sup>11</sup> The term also appears repeatedly in the context of first principles.<sup>12</sup>

But given these linguistic parallels, is Aristotle really talking about the same method here? Does what he describes fit the criteria for exploring both sides mentioned above? The context makes clear that it does. Leading up to this point Aristotle explicitly recommends looking at both a hypothesis and its contradictory: “and for all theses, both that it is thus and that it is not thus, one must examine the attack” (163a36–b1). This shows that what Aristotle has in mind meets the first two criteria for exploring both sides: it involves (a) what are taken to be exclusive and exhaustive alternatives and (b) an independent consideration of each. One might doubt, however, whether it really meets condition (c). After all, Aristotle begins the passage by specifying that the following recommendations are “for exercise and practice in these sorts of arguments” (163a29–30). One might reasonably see the aim here as merely equipping oneself to win a dialectical debate, not seeing which side is true.

While it may be true that Aristotle’s initial point is simply about training for dialectical debate more broadly, when he transitions to talking about “philosophic wisdom” he is recommending an additional use for this dialectical practice. Immediately following his point about being able to comprehensively see the consequences of each hypothesis he does not

mention its use for winning a debate; instead, he stresses how it helps one choose which side is correct (see 163b9–12 quoted above). He goes on to make abundantly clear that the aim he has in mind is the truth itself:

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But there must underlie a disposition well-suited for this sort of thing, that is goodness of disposition with respect to truth, the ability to choose the true and avoid the false well, which those who are naturally inclined are able to do well. For, judging well what is best, they appropriately love and hate what is brought before them. (*Top.* 163b12–16)

δεῖ δὲ πρὸς τὸ τοιοῦτον ὑπάρχειν εὐφυῶ, καὶ τοῦτ' ἔστιν ἢ κατ' ἀλήθειαν εὐφυΐα, τὸ δύνασθαι καλῶς ἐλέσθαι τἀληθὲς καὶ φυγεῖν τὸ ψεῦδος· ὅπερ οἱ πεφυκότες εὖ δύνανται ποιεῖν· εὖ γὰρ φιλοῦντες καὶ μισοῦντες τὸ προσφερόμενον εὖ κρίνουσι τὸ βέλτιστον.

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Aristotle emphasizes that a disposition well accustomed to and oriented towards the truth is necessary for this philosophical use of dialectic. This shows that the third criterion for exploring both sides is indeed met.

But there is another worry in light of the passage just quoted. Perhaps this ability to see the truth has nothing to do with the previous recommendation about looking to the consequences of two contradictory hypotheses. Perhaps it is simply a matter of inborn talent: those with a natural inclination towards the truth will be able to see it, but everyone else will be left in the dark. If this is right, then Aristotle may not after all have in mind the same method operative in the Platonic context, where the value of exploring both sides is its ability to provide this very understanding. This is clear in the *Parmenides*, where the exercise itself is repeatedly said to be

necessary for grasping the truth.<sup>13</sup> But Aristotle, too, draws the connection between dialectical training and a resultant ability towards the end of the chapter: “ability comes from these things, and training is for the sake of ability” (164b1–2). When he talks about being able to see the truth, then, he need not have in mind some inborn talent, but rather a disposition developed by the very training described here. And this makes good philosophical sense given the details of what Aristotle recommends. Examining an attack as well as its resolution<sup>14</sup> on either side and choosing the best among multiple lines of attack is exactly the sort of training that might help one choose the true and avoid the false (163a36–b5).<sup>15</sup>

This connection between a type of dialectical exercise and the ability to comprehensively see the truth is yet another connection to the Platonic method of exploring both sides. It is unlikely to be a mere coincidence that Aristotle is describing the very method that his teacher laid out and used for testing candidate first principles. Aristotle does indeed have first principles in mind in this chapter, as he mentions them later on.<sup>16</sup> In the next section, I will argue that the parallels with exploring both sides in Plato are equally clear in another important passage, *Topics* I.2, that makes the connection to first principles even more explicit.

## 2. The Problem of First Principles in *Topics* I.2

I am not the first one to make this connection to Plato’s *Parmenides*. Alexander of Aphrodisias makes a similar observation in his commentary on a passage in *Topics* I.2, even quoting directly from the *Parmenides* (*On Aristotle’s Topics*, 29:3–5). He also refers back to this passage when discussing VIII.14, observing how both emphasize that a familiarity with either side of the argument enables philosophical understanding (584:6–9).<sup>17</sup> Alexander is right to emphasize the parallels in *Topics* I.2 in particular, which are once again quite striking. Furthermore, the evidence here reinforces the idea that Aristotle was aware not only of the general usefulness of exploring both sides, but also of its application to first principles in particular.



The passage begins by listing three uses for the study contained within the *Topics*: for training, for argumentative encounters, and for the “philosophical sciences” (τὰς κατὰ φιλοσοφίαν ἐπιστήμας, 101a27–28).<sup>18</sup> He elaborates this third use as follows:

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and [it is useful] for the philosophical sciences, because when we are able to go through the puzzles for both sides we will clearly see the true and the false in each more easily. (*Top.* 101a34–36)

πρὸς δὲ τὰς κατὰ φιλοσοφίαν ἐπιστήμας, ὅτι δυνάμενοι πρὸς ἀμφοτέρα διαπορῆσαι ῥᾶον ἐν ἑκάστοις κατοπόμεθα τἀληθές τε καὶ τὸ ψεῦδος.

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As in *Topics* VII.14 and the *Parmenides*, we get a clear invocation of philosophy here. And once again he appears to be describing the structure of exploring both sides. Aristotle mentions going through the puzzles for “both sides” which, in the context of dialectical debate, are exclusive and exhaustive alternatives (a positive claim and its denial). In this way it meets conditions (a) and (b). As for condition (c), Aristotle is equally if not more direct in this passage that the aim is a thorough vision of the truth.<sup>19</sup> The verb he uses to describe this vision, καθοράω, once again evokes the Platonic context.<sup>20</sup> And this occurs in the context of discussing a certain sort of exercise in dialectic (γυμνασία [101a27, 28]) and the capacity that it engenders (δύναμαι [101a30, 35], ἀδύνατος [101a38]) as in the other passages discussed so far.

For these reasons, Alexander is right to connect these two passages in the *Topics* with each other and with the Platonic method of exploring both sides. As Alexander puts it: “in philosophical inquiries as a whole it is impossible to find the truth easily without first trying attacks on either side” (28:30–29:2). But I think there is more to be said about the significance of

this connection, particularly as it relates to Aristotle's attitude towards first principles. Just after highlighting the philosophical use for dialectic, he adds the following:

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and even further [it is useful for] the first things of those that concern each science. For, since the principles are prior to everything, it is impossible to say anything about internal principles that accord with a given science based on those very principles, but it is necessary to go through them through the reputable opinions concerning each. This is peculiar or most appropriate to dialectic; for, since it is capable of examining the principles of all systems, it has a path towards them.

(*Top.* 101a36–b4)

ἔτι δὲ πρὸς τὰ πρῶτα τῶν περὶ ἐκάστην ἐπιστήμην. ἐκ μὲν γὰρ τῶν οἰκείων τῶν κατὰ τὴν προτεθειῖσαν ἐπιστήμην ἀρχῶν ἀδύνατον εἰπεῖν τι περὶ αὐτῶν, ἐπειδὴ πρῶται αἱ ἀρχαὶ ἀπάντων εἰσὶ, διὰ δὲ τῶν περὶ ἕκαστα ἐνδόξων ἀνάγκη περὶ αὐτῶν διελθεῖν. τοῦτο δ' ἴδιον ἢ μάλιστα οἰκεῖον τῆς διαλεκτικῆς ἐστίν· ἐξεταστικὴ γὰρ οὔσα πρὸς τὰς ἀπασῶν τῶν μεθόδων ἀρχὰς ὁδὸν ἔχει.

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The interpretation of this passage is controversial. When read in the broader context that I have argued for so far, however, it suggests Aristotle's familiarity with the Platonic solution to the problem of first principles.

Before going into greater detail, it is worth first reminding ourselves about what Aristotle has to say about first principles elsewhere. He distinguishes between different types of principles in *Posterior Analytics* I.2. He uses 'principle' (ἀρχή) and 'first thing' (πρῶτον) to describe the general category of first principles.<sup>21</sup> Such a principle must be first in the order of explanation (not necessarily in the order of discovery), without a middle term,<sup>22</sup> better known, prior to, and explanatory of that which is concluded from it (71b21–22). These can then be divided into what

he calls an ‘axiom’ (ἀξίωμα), a necessary prerequisite for any learning, and what he calls a ‘thesis’ (θέσις), which is not such a general prerequisite (rather, it will be restricted to a specific science). The latter is then divided further into what he calls ‘hypotheses’ and ‘definitions.’ A hypothesis (ὑπόθεσις) posits the existence or nonexistence of something (just as, for instance, Plato has his character Parmenides hypothesize ‘there is one’ and ‘there is not one’ alternatively). A definition (ὀρισμός), on the other hand, does not make such a posit: it says *what* something is rather than positing *that* it is (72a14–24).

Robin Smith has given a deflationary reading of this passage where the connection between the method Aristotle is discussing and first principles is tenuous at best.<sup>23</sup> He is responding to previous interpretations, primarily that of Terence Irwin in his book *Aristotle’s First Principles*, which suggest that Aristotle sees dialectic as having the ability to establish first principles. According to Smith, dialectic does not have the power to establish anything, let alone first principles; all this passage says is that dialectic, unlike the specific sciences, can discuss the general first principles (axioms in the above sense) given its generality. Much comes down to what we mean by ‘establish.’ I agree that dialectic is not a demonstrative science and thereby does not have the ability to establish any conclusions demonstratively. But Smith goes too far in positing no special relationship between dialectical skill and an understanding of first principles. Properly understood, the passage does suggest that at least one use of this dialectical skill is inquiring into first principles through exploring both sides, just as Plato recognizes. And while exploring both sides does not establish first principles demonstratively or provide an unshakeable proof, it does bring about the type of robust and systematic understanding necessary for first principles.

Smith motivates his deflationary reading of the relationship between dialectic and first principles as described here in *Topics* I.2 with a unique interpretation of the subject matter of the *Topics* as well as several textual considerations. On Smith’s view, the purpose of the *Topics* is to expound a dialectical art, a manual for succeeding in dialectical arguments, analogous to a fencing manual that gives advice on succeeding at fencing (“Uses of Dialectic,” 343). He argues

that the I.2 passage is only discussing Aristotelian axioms and emphasizes the art's ability to discuss even these most general principles ("Uses of Dialectic," 351–54). I will not be taking a stance here on Aristotle's general views about dialectic or on how precisely he would characterize the method that I am calling 'exploring both sides.' That being said, it is worth looking at Smith's textual considerations to show that the passage need not be read in such a deflationary way. The passage is perfectly consistent with, even suggestive of, the idea that the skill being discussed is useful for testing candidate principles in all three varieties discussed above.

Smith points out that there are at least two ways to understand the phrase that I have translated "the first things of those that concern each science" (τὰ πρῶτα τῶν περὶ ἐκάστην ἐπιστήμην). I am understanding the Greek article τῶν as neuter and referring generally to all of the propositions that concern a particular science; relatedly, I understand 'the first things' to refer to theses, that is the principles specific to a given science. Smith suggests that, if this is what Aristotle meant, he would have left out the article altogether. Instead, he understands τῶν as feminine, referring not just to any proposition but to the principles of a given science. The first of those principles, he suggests, are the axioms, the most general principles. Thus, he translates "the first ones among the principles about any particular science." He also understands the phrase that I have translated "since the principles are prior to everything" (ἐπειδὴ πρῶται αἱ ἀρχαὶ πάντων εἰσὶ) differently. Smith translates "since the principles of everything are the first principles," and understands the point to be that one cannot derive the general axioms from the science-specific theses because the former are first. Yet there is a serious problem with Smith's understanding of both of these phrases: his translations imply that Aristotelian axioms are prior to Aristotelian theses. If this were true, then the theses would not count as first principles. While the axioms are indeed more general, it would be inconsistent for Aristotle to think that they are *prior*.

I take Aristotle's point here not to be that you cannot derive axioms from theses, but rather that you cannot derive first principles from *anything* since they are meant to be first. To

put it differently, when dealing with principles there is nowhere higher “up” to go. But this is precisely why it is useful to test those principles by following out their consequences as well as the consequences of the contradictory. Because they cannot be demonstrated by something prior, exploring both sides provides an alternative method for testing whether or not they are true. And this is precisely what Aristotle has been discussing in the surrounding context: the usefulness of going through the puzzles on either side for finding the truth. On my view, Aristotle is making the point about science-specific principles in particular. It will be especially applicable to hypotheses which, by definition, are part of a contradictory pair.

Smith also draws attention to the final line of the passage, which he believes has been misleadingly translated. Most translators understand the last two words ‘it has a path’ (ὁδὸν ἔχει) as governing the phrase ‘in relation to the principles of all systems’ (πρὸς τὰς ἀπασῶν τῶν μεθόδων ἀρχάς). But Smith insists: “it would be amazing for Aristotle to say that dialectic can actually *establish* the indemonstrable first principles on which each science depends and which demonstration is powerless to prove” (“Uses of Dialectic,” 353). Instead, he takes the prepositional phrase with the point about its being “capable of examining” (ἐξεταστική), and understands Aristotle simply to be repeating the point about dialectic’s generality. Thus he translates: “since it is examinative with respect to the principles of *all* disciplines, it has a way to do this” (“Uses of Dialectic,” 352). But again, Smith’s deflationary reading is not necessary. He is right to point out that dialectic cannot *establish* first principles, but this need not be how we understand the point about its having a “way” or “path” towards them. I have translated the prepositional phrase with both points about it being “capable of examining” and “having a path” which is less redundant.<sup>24</sup> But on any construal my interpretation makes equally good sense of Aristotle’s point here. The point is that dialectical skill (as opposed to demonstrative science) provides a way of testing (though not establishing) the truth of first principles. And this will give us traction for understanding (though not demonstratively proving) which ones we should take to be true. We need not take Smith’s well-motivated worry about reading too much into the power of dialectic to his deflationary extreme. The method of exploring both sides is truly useful for

assessing first principles above and beyond the context of a dialectical bout. Smith admits that his interpretation leaves wide open the question of how Aristotle thought we come to understand first principles (“Uses of Dialectic,” 355). While exploring both sides cannot demonstratively establish any truths, my interpretation has the advantage of explaining how we can come to accept one candidate principle over another within the Aristotelian system. Furthermore, we will see in section 4 how Aristotle actually employs the method of exploring both sides as part of an inquiry into what these first principles are.

### 3. A Conflict with the *Analytcs*?

Up to this point I have focused on the dialectical aspect of exploring both sides and its relevance for testing candidate first principles. Looking to both a hypothesis and its contradictory, as one does in dialectical practice, is especially useful when one cannot prove demonstratively which one is true. But does this mean that Aristotle’s syllogistic has absolutely no role to play in an inquiry into first principles? And what are we to make of those passages in the *Analytcs* that appear to suggest a different answer to the problem of first principles? A closer look at the *Analytcs* will show that the two works are in fact complimentary; the *Topics* simply fills out several important lessons about inquiring into principles not detailed in the *Analytcs*.

The topic of first principles is clearly broached in *Prior Analytcs* I.27–30. Here Aristotle discusses how one can find the proper premises to construct deductions within a given science. This, of course, would include the most fundamental premises of a given science, the science-specific principles or theses (θέσεις) in the technical sense. Aristotle appears to reference these principles in the very first sentence of I.27:

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It now must be said how we will always be well supplied with syllogisms with regard to what is set before us, and through what sort of path we will grasp the principles in each case.<sup>25</sup> (*APr.* 43a20–23)

πῶς δ' εὐπορήσομεν αὐτοὶ πρὸς τὸ τιθέμενον ἀεὶ συλλογισμῶν, καὶ διὰ ποίας ὁδοῦ ληψόμεθα τὰς περὶ ἕκαστον ἀρχάς, νῦν ἤδη λεκτέον.

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What he goes on to discuss in I.27–30 is how, given a set of terms within a given science and the facts about their application, we can systematically find the right premises from which to deduce those facts as the conclusion. Tuominen helpfully stresses how this is not a method for inquiring into any of the relevant facts; instead, it is a procedure to be performed once we already know all of the facts in question (“Aristotle’s Theory and Practice,” 143). A systematic application of this procedure can even tell us which among them should play the role of science-specific principles that are without a middle term, better known than, prior to, and explanatory of the rest. But the truth of those principles will already be known even if the proper explanatory relations have not yet been recognized.<sup>26</sup>

Thus, the procedure of *Posterior Analytics* I.27–30 addresses a related but distinct problem from the one that exploring both sides is geared towards. It tells us how to go about identifying which *from an already established set of facts* can be used as premises to demonstrate a given conclusion and ultimately which belong ‘higher up’ or ‘lower down’ in an explanatory system. But exploring both sides allows us to test a candidate principle *whose truth or falsity we do not yet know* at a given stage of inquiry. Exploring both sides will be appropriate at a prior stage of inquiry, when we might not even know whether some potential subject exists or whether some predicate truly applies. By exploring both sides we can test the truth of this candidate principle by seeing what follows from it as well as from its contradictory (or from a

larger set of exclusive and exhaustive alternatives). This information will of course be relevant for the later question of where the principle stands within the context of the science as a whole.

Both methods are related, however, in that they involve comparing the explanatory power of different propositions. And in both cases the truth of at least some other propositions must be taken for granted to make any progress. Aristotle makes clear later on in this section of the *Prior Analytics* that this will be the case for coming to know science-specific principles as such:

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Both for philosophy and for any art or skill whatsoever, the path is the same for all of them. . . . And the majority [of the principles] are peculiar to each individually. For this reason it is characteristic of experience to provide the principles in each case, I mean, for example, astronomical experience in the case of astronomy (for astronomical demonstrations were found once the appearances were sufficiently grasped), and it is similar in the case of whatever other sort of art and science. As a result, if the underlying facts are grasped in each case, we will already be in a position to make the demonstrations clear. (*APr.* 46a3–4, 17–24)

Ἡ μὲν οὖν ὁδὸς κατὰ πάντων ἢ αὐτὴ καὶ περὶ φιλοσοφίαν καὶ περὶ τέχνην ὅποιοι οὖν καὶ μάθημα. . . ἴδιαι δὲ καθ' ἑκάστην αἰ πλεῖσται. διὸ τὰς μὲν ἀρχὰς τὰς περὶ ἕκαστον ἐμπειρίας ἐστὶ παραδοῦναι, λέγω δ' οἷον τὴν ἀστρολογικὴν μὲν ἐμπειρίαν τῆς ἀστρολογικῆς ἐπιστήμης (ληφθέντων γὰρ ἰκανῶς τῶν φαινομένων οὕτως εὐρέθησαν αἱ ἀστρολογικαὶ ἀποδείξεις), ὁμοίως δὲ καὶ περὶ ἄλλην ὅποιοι οὖν ἔχει τέχνην τε καὶ ἐπιστήμην· ὥστ' ἐὰν ληφθῇ τὰ ὑπάρχοντα περὶ ἕκαστον, ἡμέτερον ἤδη τὰς ἀποδείξεις ἐτοίμως ἐμφανίζειν.

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This passage shows that Aristotle does indeed have science-specific principles in mind in this portion of the *analytics*. Knowing the underlying facts aides in coming to know the principles; the method described through *Posterior Analytics* I.27–30 would allow one infer how a



systematic set of scientific facts are to be explained and thus which ones are to play the role of a principle. The same abductive structure will be present in exploring both sides even when all of the facts are not yet known. Exploring both sides will still test a candidate principle based in part upon other claims that are taken to be true. For instance, the appearance of plurality in the physical world around us will be one of the underlying facts with which we test candidate principles about the type and number of beings, as Aristotle does in *Physics* I.2.<sup>27</sup>

Yet what Aristotle does not make explicit here, and what is crucial for understanding the usefulness of exploring both sides, is that it is sometimes useful to (1) explore candidate principles *hypothetically* and (2) systematically look at a set of exclusive and exhaustive alternatives as well, in order to determine which is most likely to be true. Aristotle does not make this explicit here simply because he is not talking about the method of exploring both sides; again, he is discussing a later stage where all of the underlying facts are already known. But nowhere here does he say that we cannot test a candidate principle for truth before this stage. This, I have argued, is what Aristotle is discussing in the *Topics* I.2 and VIII.14 passages. In fact, this helps explain why Aristotle explicitly refers back to the *Topics* just after this passage in the very last lines of *Prior Analytics* I.30:

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It has just been said, then, in a general manner, how it is necessary to choose one's premises; we have gone through it in detail in the treatise concerning dialectic. (*APr* 46a28–30)

Καθόλου μὲν οὖν, ὃν δεῖ τρόπον τὰς προτάσεις ἐκλέγειν, εἴρηται σχεδόν· δι' ἀκριβείας δὲ διεληλύθαμεν ἐν τῇ πραγματείᾳ τῇ περὶ τὴν διαλεκτικὴν.

</ext>

The *Topics* not only discusses finding appropriate premises for arguments (in this case in a dialectical rather than a scientific context), but it also discusses a special use of dialectic for

testing the truth of candidate principles, exploring both sides. Smith does not find the reference to the *Topics* plausible and goes as far as to suggest removing these lines as a later interpolation in his commentary. Without any other indication of a problem with the text, however, it is best to keep it as is; recognizing the context of exploring both sides can help us make better sense of why Aristotle would have dialectic and the *Topics* in mind here.

This all goes to show that the discussion in *Prior Analytics* I.27–30 is distinct from, but compatible with, Aristotle’s discussion of exploring both sides in the *Topics*. The same goes for the *Posterior Analytics*, another context where Aristotle discusses first principles. David Bronstein has recently published a helpful study of the book, *Aristotle on Knowledge and Learning*, where he argues that the *Posterior Analytics* systematically addresses the process of coming to a complete scientific understanding, including the discovery of definitions. According to Bronstein, Aristotle addresses the process of scientific learning in reverse order, starting with the final stages of scientific inquiry in *Posterior Analytics* I and proceeding to earlier stages in *Posterior Analytics* II. This process of course involves first principles, and Bronstein’s interpretation of how we test and ultimately come to understand them is compatible with what Aristotle has to say about exploring both sides. But Bronstein’s interpretation also helpfully highlights a gap in the *Posterior Analytics* that exploring both sides can fill, motivating Aristotle’s separate discussion in the *Topics*.

On Bronstein’s view, scientific inquiry involves first establishing that some subject kind exists, discovering its essential attributes and thereby its definition, discovering its demonstrable attributes, and finally coming to understand the proper explanation for why each demonstrable attribute belongs to that subject kind.<sup>28</sup> He argues that we only come to a full understanding of the definition at the end of this process, once we see how the essential attributes of the definition can be used to demonstrate and thus explain its non-demonstrable attributes.<sup>29</sup> This point is closely aligned with the idea behind exploring both sides that, when dealing with candidate principles, one must test them by looking at their consequences. It is also compatible with the suggestion of looking to the consequences of other candidate principles that form an exclusive

and exhaustive set, though this point does not feature in the *Posterior Analytics* as it does in the *Topics*. Thus Aristotle's discussion of definition in this work at the very least does not conflict with, and provides some support for, the picture of exploring both sides in Aristotle that I have been defending. Yet even more support comes from what this discussion leaves out.

Definitions are clearly a central theme in the *Posterior Analytics*, which Bronstein repeatedly highlights by calling them the "most important" principles.<sup>30</sup> But they are not the only type of principle for Aristotle; Bronstein's emphasis on definition belies the fact that the *Posterior Analytics* has little to say about the other two categories of first principle, axioms and hypotheses. Setting aside the extent to which exploring both sides plays a role in testing candidate definitions, I want to stress that exploring both sides is especially applicable to testing candidate axioms and hypotheses. The lack of an explicit discussion of exploring both sides and of these two types of principle in the *Posterior Analytics* goes hand in hand.

Bronstein himself recognizes this gap in the *Analytics*. He admits that Aristotle says very little about how we come to know the existence of what he calls "primary subject-kinds," which qualify as hypotheses in the technical sense (that is, science-specific principles asserting or denying the existence of something).<sup>31</sup> But we do get a hint about the importance of examining principles *hypothetically*, an important element of exploring both sides, for both types of science-specific principle:

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In some cases there is some other cause, in others there is not. As a result, it is clear that, in fact, some cases of the what-it-is are without a middle term and a principle, in which cases it is necessary to hypothesize both that it is and what it is or to make it clear in some other way (which the mathematician does; for they hypothesize both what the unit is and that it is). (*APo.* 93b21–25)

Ἔστι δὲ τῶν μὲν ἕτερόν τι αἴτιον, τῶν δ' οὐκ ἔστιν. ὥστε δῆλον ὅτι καὶ τῶν τί ἐστὶ τὰ μὲν ἄμεσα καὶ ἀρχαί εἰσιν, ἃ καὶ εἶναι καὶ τί ἐστὶν ὑποθέσθαι δεῖ ἢ ἄλλον τρόπον φανερὰ ποιῆσαι (ὅπερ ὁ ἀριθμητικὸς ποιεῖ· καὶ γὰρ τί ἐστὶ τὴν μονάδα ὑποτίθεται, καὶ ὅτι ἔστιν).

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Despite stressing the importance of doing so, Aristotle does not go into more detail here about how to test first principles hypothetically. The *Posterior Analytics* is more focused on the negative point that principles are not straightforwardly demonstrated as other scientific propositions are. I have suggested, however, that we can find more positive detail about how we inquire into first principles in the *Topics*. This requires not only exploring the candidate principle in question hypothetically, but also doing the same for the rest of a set of exclusive and exhaustive alternatives.

One other hint about testing principles that is consistent with my understanding of exploring both sides comes earlier in the book at *Posterior Analytics* I.11. There he says that all sciences associate with one another when it comes to the common principles (axioms in the sense discussed above) and that dialectic in particular can address them given its ability to ask genuine questions and not just demonstrate as the other sciences do (77a26–24). This shows that dialectic does indeed have a special role to play when it comes to axioms. But the reason that it does makes dialectic equally useful for other principles as well: it can keep open the question of whether or not a given principle is true as part of a process of inquiry, precisely what one does when exploring both sides. Again, there is no indication here that the *Analytics* is revising or replacing the method for testing candidate principles in the *Topics*. If anything it highlights the limitations of demonstration as a one-size-fits-all method and the need for complementary methods such as the special use of dialectic discussed in the *Topics*.

Thus we have seen several important gaps in the *Analytics* that Aristotle's recognition of exploring both sides can help us fill. While, when it comes to first principles, the *Analytics* has the most to say about definitions, it is important to recognize that we need a way of discussing

and inquiring into the truth of axioms and hypotheses as well. Exploring both sides is perfectly suited for this task. To do so, one must sometimes inquire *hypothetically*, exploring the consequences of a candidate principle without yet firmly asserting or denying its truth. And though one cannot simply demonstrate the truth of a principle, it is helpful to explore each of an exclusive and exhaustive set of the alternatives to systematically test which one is true. Of course, in following out the consequences of each alternative one may in fact construct deductions and use underlying scientific facts as part of the basis for inquiry. In this way exploring both sides is consistent with the deductive and explanatory tests for definitions described in the *Analytics*. But the process of exploring both sides requires a special use of dialectic alongside this scientific methodology, one that is described more fully in the *Topics*.

#### 4. Exploring Both Sides in Aristotle's *Metaphysics*

So far I have argued that Aristotle shows an awareness of the Platonic method of exploring both sides in the *Topics* and discusses its application for testing first principles in particular. I have also suggested that this method is compatible with and in fact complements what Aristotle says in the *Analytics*. It should be no surprise, then, that Aristotle employs the method when discussing first principles in his *Metaphysics*. A systematic survey is beyond the scope of the present paper, but a few brief examples will show that Aristotle does in fact employ the very method that he recognizes in the *Topics*.

Starting in the first book of the *Metaphysics* Aristotle is clear that first principles are a central topic. He announces that he is after a specific type of knowledge, wisdom, which is knowledge about certain types of first principles (*Met.* A.1–2, 982a1–5). He then asks what the principles are like and how many there are. He begins this investigation with a survey of his predecessors in the remainder of Book A, then lays out several puzzles about these principles in Book B. Unsurprisingly, this puzzle-setting portion of the work employs the structure of

exploring both sides. There are also a series of parallels with the texts we have already discussed that make these connections even more salient.

Rachel Barney has persuasively argued that Aristotle is engaged in a method that harkens back to Plato's *Sophist* in *Metaphysics A*, in particular the discussion of predecessors' views on "how many and of what sort" the fundamental beings are and the so-called 'Battle between Gods and Giants.'<sup>32</sup> She also draws an interesting connection between this stage of the inquiry and the use of dialectical skill for encounters that Aristotle discusses in *Topics I.2*.<sup>33</sup> Yet the connections are even tighter in *Metaphysics B*, where I will suggest that we actually see the method of exploring both sides employed.<sup>34</sup> The first connection to note is the aporetic context; Aristotle begins *Metaphysics B* by emphasizing the importance of going through the *aporiai* concerning the case at hand (995a24–b4). Aristotle uses the same verb to describe thoroughly going through the puzzles as used in *Topics I.2* and Plato's *Sophist* (διαπορέω [*Met.* 995a28, 35; *Top.* 101b35; *Sophist* 250e5]).<sup>35</sup> He even mentions puzzles about some of the same principles mentioned in the *Parmenides* and *Sophist* when he later suggests that one must inquire into "whose job it is to theorize about all those things which the dialecticians try to examine, basing their examination on reputable opinions only, namely about sameness and difference and similarity and dissimilarity and contrariety, and also about the prior and posterior and all such things" (995b21–25).<sup>36</sup> Aristotle also makes clear that he sees himself as following out the consequences of the various views discussed, using the very same term for 'consequences' (συμβαίνοντα) from the *Topics* and the Platonic context.<sup>37</sup>

*Metaphysics B* systematically goes through a series of *aporiai* that have the structure of exploring both sides: a set of what are taken to be exclusive and exhaustive alternatives, an independent consideration of each one, and a focus on which of the alternatives is true. The answers to these *aporiai* are not immediately given, but rather worked out in later books of the *Metaphysics*.<sup>38</sup> For now, I would like to point out just two examples that clearly fit the pattern of exploring both sides, starting with the very first *aporia*. Aristotle announces it as follows:

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The first aporia is the one which we puzzled over in our prefatory remarks, whether it is characteristic of one or of more than one science to consider the causes. (*Met.* 995b4–6)

ἔστι δ' ἀπορία πρώτη μὲν περὶ ὧν ἐν τοῖς πεφροισμασμένοις διηπορήσαμεν, πότερον μιᾶς ἢ πολλῶν ἐπιστημῶν θεωρῆσαι τὰς αἰτίας.

</ext>

The causes being referred to here are Aristotle's four canonical causes, considered as fundamental causes and principles in *Metaphysics* A. It is assumed that there is at least one science that studies these causes, the primary candidate being the science of wisdom.<sup>39</sup> Based on this assumption, there will be either one or more than one science that does so. Thus condition (a) of exploring both sides is met: we have what are taken to be an exclusive and exhaustive set of alternatives. Aristotle goes on to explore the consequences of each alternative and tentatively concludes that the second is most promising. He begins exploring the alternative that there is only one science of all the causes but finds problematic consequences (996a20–b1). He then turns to the alternative that there is more than one science and the problem of figuring out, if so, which of the sciences is the wisdom that they are seeking (996b1–24). He concludes: “it would seem that considering each of these causes is characteristic of different sciences” (996b24–26). Thus it is clear that conditions (b) and (c) are met as well: each alternative is explored in turn with an eye towards which one is true.

We see the same pattern of exploring both sides repeated throughout *Metaphysics* B. For example, Aristotle later asks whether the principles of destructible and indestructible things are the same or different:

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A puzzle inferior to none has been overlooked both by people today and by those in the past, namely whether the principles of what is destructible and what is indestructible are the same or different. (*Met.* 1000a5–7)

Οὐθενὸς δ' ἐλάττων ἀπορία παραλέλειπται καὶ τοῖς νῦν καὶ τοῖς πρότερον, πότερον αἱ αὐταὶ τῶν φθαρτῶν καὶ τῶν ἀφθάρτων ἀρχαὶ εἰσιν ἢ ἕτεραι.

</ext>

Once again the alternatives are exclusive and exhaustive (again, on the assumption that there are such principles), and Aristotle explores each one with an eye towards which is true. He begins with the alternative that the principles are the same, which he takes his predecessors to have believed, and finds serious difficulties (1000a7–b22). He then specifies difficulties for the only other alternative that the principles are different, leaving us in *aporia* for the time being (1000b22–1001a3). Despite the fact that Aristotle gives less of a hint about which side he will end up on in this case, it still meets the criteria for an application of exploring both sides.

This is all to say that Aristotle does indeed employ the method of exploring both sides in his own work, making it even more likely that the Platonic parallels in the *Topics* are no mere accident. And not only does he use the same structure as Plato, but he also uses it with a similar application. In both cases, the method is used to discuss first principles. In both cases, it also sets up well-motivated *aporiai*, with serious difficulties on either side, as a way to encourage further inquiry. But there are some interesting differences in Aristotle's use of the method in the *Metaphysics* as well. Plato used the method for testing candidate first principles, that is taking a series of candidate principles (e.g. the existence of one, many, likeness, unlikeness, motion, rest, being, and not-being) and exploring their consequences along with the consequences of denying their existence. Yet Aristotle is not exploring the consequences of candidate first principles themselves in *Metaphysics B*; instead, he is investigating claims *about* those principles. He sets up an inquiry into them by first exploring what those principles will have to look like (for



example, will they be the subject of a science that explores all four types of cause? will they be the principles of both what is destructible and what is indestructible?).<sup>40</sup> Thus, while Aristotle may have recognized and agreed with the importance of exploring both sides in relation to first principles, he may have also disagreed with Plato on how to discover those principles. Rather than simply trying different principles on for size to see which fits best, Aristotle uses the method of exploring both sides to provide a more robust characterization of what they are looking for in the first place.<sup>41</sup>

But it is important not to overemphasize this difference in application. Both Plato and Aristotle employ the method of exploring both sides as defined by the criteria listed above: an independent analysis of each of a set of exclusive and exhaustive alternatives with the aim of seeing which one is true. Furthermore, both recognize the use of this method for discussing first principles in particular and employ it to this end. The difference comes in how exactly they employ the method for finding first principles: Plato recommends an exhaustive strategy of testing a range of different candidate principles along with their alternatives, while Aristotle uses the method on claims *about* the principles to narrow down the potential candidates. In both cases exploring both sides is not simply a method of display or persuasion, but rather a method of discovery: it allows us as inquirers to see not only *that* a certain candidate appropriately fits the role of a first principle, but also *why* we should accept this principle rather than one of the alternatives.

Now we can finally return to the problem of first principles with which we began. As it turns out, emphasizing the importance of exploring both sides enables a natural account of how we acquire knowledge of first principles and what that peculiar type of understanding looks like. We do not demonstrate the principles, nor is there some innate capacity that automatically produces this knowledge. Since these principles are first, there are no prior principles to derive them from, but that is consistent with being able to test them by way of their consequences as compared with the consequences of the alternatives.<sup>42</sup> Aristotle addresses this method explicitly in the *Topics* because of its relation to dialectic, but what he says there is perfectly consistent

with and complementary to his focus on definition and on the later stages of inquiry in the *Analytcs*. A single application of exploring both sides allows one to test the truth of a candidate principle in a way that no demonstrative methodology could. But this alone will not properly test the *firstness* of the candidate principle, something that requires assessing its explanatory power in comparison with other candidates beyond a single set of exclusive and exhaustive alternatives. Aristotle emphasizes these explanatory considerations in the *Analytcs*, and brings to bear meta-principles *about* the first principles in *Metaphysics B* for this very reason.<sup>43</sup>

Aristotle employs the method of exploring both sides to claims about the principles in *Metaphysics B* for the same reason they are useful for the principles themselves: there is nothing prior to derive these from except for the as yet unestablished principles. As long as those principles are unknown, exploring both sides is precisely what is in order. It gives us the capacity to see which one is true based on its positive implications as well as the negative implications of the alternatives. It is not a demonstrative guarantee of truth, but it is more systematic than a single demonstration would be. Thus it makes perfect sense that Aristotle would reserve a unique term for this type of understanding (νοῦς [*APo.* II.19, 100b5–17]). It also makes sense that Aristotle would refer to it as a special kind of ability (δύναμις) as he stresses in the *Topics* VIII.14 passage discussed above. We can likely thank Plato for developing this ability for exploring both sides in his pupil. At least in this respect, Aristotle appears not to have strayed too far from his teacher’s advice.<sup>44</sup>

## Bibliography and Abbreviations

### *Abbreviations of Aristotelian works*

<i>APr.</i>	<i>Prior Analytics</i>
<i>APo.</i>	<i>Posterior Analytics</i>
<i>Ath. pol.</i>	<i>Athenian Constitution</i>

<i>Col.</i>	<i>On Colors</i>
<i>De div.</i>	<i>On Divination in Sleep</i>
<i>EN</i>	<i>Nicomachean Ethics</i>
<i>GA</i>	<i>Generation of Animals</i>
<i>GC</i>	<i>On Generation and Corruption</i>
<i>Met.</i>	<i>Metaphysics</i>
<i>Phys.</i>	<i>Physics</i>
<i>Top.</i>	<i>Topics</i>
<i>SE</i>	<i>Sophistical Refutations</i>

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<sup>1</sup> Karasmanis, “Dialectic and the Second Part of Plato’s *Parmenides*.”

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<sup>2</sup> ‘Taken to be’ is an important qualifier here. A fully positive application of the method requires that the alternatives are truly exclusive and exhaustive; as a result one will understand why to go with one alternative not only for its positive consequences but also for any problematic consequences with the other alternatives. But even in cases where the alternatives are not truly exclusive and exhaustive, if genuinely taken to be so then the method can still be useful. It can create a well-motivated *aporia*, a situation with problems on either side, that inspires some resolution through recognizing missing alternatives or some other mistake in the initial setup. If the alternatives are not taken to be exclusive and exhaustive, however, then the results of exploring one alternative no longer carry any implications for the other alternatives, a key feature of exploring both sides.

<sup>3</sup> In this case it is important that the third option is explored at length and that they are open to the possibility that it too could be false (the Visitor explicitly raises this possibility at 259a1–5). Otherwise it would be a simple *reductio* where the third option is taken for granted once problems are found with the first two; in that case, it would not meet condition (b) for exploring both sides. For further discussion of these passages, see my “New Reading” (forthcoming).

<sup>4</sup> All translations are my own from the most recent *Oxford Classical Texts* volume in each case. I include my own translations to ensure consistency of terminology and to make clear how I am construing the original Greek.

<sup>5</sup> The same language is used in the *Sophist* in the context of exploring both sides as well (see 237a3, 249b5, and 251d6).

<sup>6</sup> The recommendation in the *Parmenides* begins with Parmenides asking “What, then, will you do about philosophy?” (Τί οὖν ποιήσεις φιλοσοφίας πέρι [135c5]).

<sup>7</sup> The present passage states that it is “no small tool.” The *Parmenides* describes it as a great task (πολὸν ἔργον [127a6, 136d1], ὅσον ἔργον [136d6]) and it even strikes Socrates as an “unimaginable affair” (ἀμήχανον πραγματείαν [136c6]).

<sup>8</sup> Cf. also Plato’s use of the related καθοράω and διοράω in the *Parmenides* passage (135c7 and 136c5 respectively). Aristotle himself uses καθοράω in the related *Top.* 1.2 passage (quoted

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below). Miira Tuominen also points out how Alexander uses συνοράω in his commentary on that *Top.* I.2 passage to describe how dialectic can provide a synoptic understanding of how to solve an *aporia* (“Aristotle’s Theory and Practice,” 151).

<sup>9</sup> *EN* X.9 1181b21. Cf. *Poetics* 24 1459b19, *On Color* 799b20.

<sup>10</sup> *Ath. pol.* 40.1.5; *Col.* 796b17; *De div.* 464b13; *EN* III.8, 1116b7; *GA* I.16, 721a17; *GC* I.2, 316a5; *SE* 15, 174a18; and *Top.* I.17, 108a14.

<sup>11</sup> *EN* IV.7, 1127a17; *Top.* I.14, 105b11, I.18, 108b20, VIII.2, 158a4–5.

<sup>12</sup> *GC* I.1, 314b13, I.2, 316a5; *Met.* A.3, 984b2; *Phys.* I.3 186a32; *SE* 5, 167a38; *Top.* I.14, 105b11, I.18, 108b20, VI.10, 148a42.

<sup>13</sup> Parmenides opens with the following exhortation: “Lift yourself up then and train more by what seems to be useless and is called prattle by the Many. [Do this] while you are still young: if you don’t, the truth will escape you” (135d3–6). After a detailed description of exploring both sides he again stresses that it is necessary “if you, practicing properly, are going to thoroughly see the truth” (136c4–5). Zeno underlines the point as well, adding that “without this wandering, detailed excursion through all things it is impossible to have understanding while hitting upon the truth” (136e1–3).

<sup>14</sup> The Greek word is λύσις (163b1). Gabriela Rossi has persuasively argued for an important distinction between *refutation* (ἔλεγχος) and *resolution* (λύσις) in Aristotle (“Going through *Aporiai*,” 212–14). She shows that the latter involves analyzing the underlying argument rather than simply refuting the thesis in question and that it is a better fit for the philosophical use of dialectic discussed in *Top.* I.2 (see the next section for a discussion of this passage).

<sup>15</sup> There are at least three different interpretations, broadly construed, of what Aristotle might have in mind here. The objection relies on the rather extreme idea that the ability to choose the true and avoid the false is completely innate and has no relation to the method being discussed. I am inclined to think that innate ability has very little role to play here: even though the phrase “κατ’ ἀλήθειαν εὐφυΐα” might invoke ideas of innate ability, the following appositive phrase “τὸ δύνασθαι . . .” suggests to me that throughout Aristotle is thinking of the type of ability that can



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be developed by training and enabled by having explored both sides. Yet there are of course a variety of middling views where some robust innate ability is necessary: perhaps a sort of natural cleverness is required to be developed into this ability, or perhaps a knack for the truth is necessary in addition to a complementary dialectical ability that analyzes the different alternatives in the first place. This appears to be Alexander of Aphrodisias' view as discussed by Tuominen ("Aristotle's Theory and Practice," 149–52). These views, too, are perfectly consistent with my contention that Aristotle has in mind the method of exploring both sides.

<sup>16</sup> πρώτων θέσεων, 163b18–19; ἀρχάς, 27–28; ἀρχῆς καὶ ὑποθέσεως, 33.

<sup>17</sup> More recently, Rossi and Tuominen have discussed the connection between I.2 and VIII.14 as well (Rossi cites a number of others who have observed the connection: "Going through *Aporiai*," 229n46). Enrico Berti also discusses the connection to Plato's *Parmenides* and recognizes the importance of looking to both a hypothesis and its contradictory, but does not discuss the method in more detail ("Aristote et La Méthode Dialectique Du *Parménide* de Platon," 342–43).

<sup>18</sup> Alexander plausibly suggests that Aristotle has in mind here the different domains of philosophical inquiry. He lists physics, ethics, logic, and metaphysics (*On Aristotle's Topics*, 28:25–27).

<sup>19</sup> My understanding of exploring both sides is consistent with Rossi's understanding of the dialectical resolution of an *aporia*, thus consistent with her take on this philosophical use of dialectic. Rossi sets aside the connection to first principles, however, and leaves out the Platonic background which I think lends further insight into the method discussed here ("Going through *Aporiai*," 211).

<sup>20</sup> This verb is over ten times more frequent in Plato than in Aristotle, with 157 occurrences in the Platonic corpus (2.66 occurrences per 10,000 words) and only 21 in Aristotle's works (0.20 occurrences per 10,000 words).

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<sup>21</sup> Aristotle goes out of his way to specify that he uses the two terms interchangeably in the present context: “I mean the same thing by ‘principle’ and ‘first thing’” (ταὐτὸ γὰρ λέγω πρῶτον καὶ ἀρχήν [72a6–7]).

<sup>22</sup> The Greek word here is ἄμεσος. The standard translation, ‘immediate,’ is misleading. It is often natural to translate Greek roots into Latin ones, but in this case the English carries connotations of being self-evident or intuitively grasped that are not present in the Greek. The word literally means “without a middle term” as is clear, for example, from *APr.* II.19 where he recommends making a syllogism ‘without a middle term’ when one wants to hide their strategy from an opponent (ἄμεσα, 66a37). Aristotle only uses the term in the *Analytics*, and it appears to be an Aristotelian coinage.

<sup>23</sup> “Uses of Dialectic,” 335–58.

<sup>24</sup> I agree with Smith that taking ἐξεταστικός on its own seems unnatural, though the rarity of the word makes it hard to gain much independent traction on its use with πρὸς. There is precedent for taking it with ὁδὸν ἔχει, however. Herodotus speaks of a literal ‘road to the west’ using πρὸς (*Historiai* II.17 ln15–16: “ἡ δὲ ἑτέρα τῶν ὁδῶν πρὸς ἐσπέριν ἔχει”) and, in the *Analytics*, Aristotle does often use πρὸς to indicate the proposition being supported by argument (e.g. *APr.* I.43, 50a11).

<sup>25</sup> I have aimed to preserve the ambiguity of the original Greek with my translation “in each case” (περὶ ἕκαστον). It could imply its own general subject (Smith, for example, translates “for any particular subject”), or it could refer back to ‘what is set before us’ in the previous clause (thus Gisela Striker translates “about each thing”). This is connected to a question about the word I have translated ‘principles’ (ἀρχάς), which can also mean ‘starting points’ more generally. Striker takes the latter reading, suggesting in her commentary that Aristotle is referring generally to the premises of any syllogism as its starting points. Smith, on the other hand, suggests in his commentary that Aristotle means principles in the technical sense, more specifically the principles that are specific to any given science. Either way, the procedure Aristotle discusses in *APr.* I.27–30 will apply both for principles and for subordinate premises (see below).

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<sup>26</sup> Cf. also Smith’s commentary on 43b1–11 (150). This procedure can help us test for the firstness of candidate principles already known to be true (that is, whether or not they are appropriate for such a fundamental explanatory role) but is not on its own a method for testing their truth.

<sup>27</sup> Cf. Plato’s *Sophist* where, for example, the presence of  $\nu\omicron\delta\varsigma$  is an underlying fact used to test the change-based ontology of the Giants and the rest-based ontology of the Friends of Forms. This is yet another Platonic application of exploring both sides.

<sup>28</sup> See *Aristotle on Knowledge and Learning* 6–7 for a helpful summary of Bronstein’s view with references to where he discusses each stage in greater detail.

<sup>29</sup> *Aristotle on Knowledge and Learning* chs. 6 (esp. 79), 12, and 13. This is a point that Bronstein holds in common with what he calls the “explanationist picture,” a view that he argues against in ch. 8. Thus the compatibility with exploring both sides does not depend on Bronstein’s more controversial claim that we grasp a preliminary account of the definition before this explanatory stage.

<sup>30</sup> *Aristotle on Knowledge and Learning*, 4, 8, 51–52, 61, 69, 228, and 229.

<sup>31</sup> “It needs to be acknowledged, however, that the manner in which we seek and discover the existence of both types of subject-kind . . . is perhaps the least developed aspect of Aristotle’s theory of scientific inquiry” (*Aristotle on Knowledge and Learning*, 188). Bronstein also calls his own account of how this process “highly speculative” (*Aristotle on Knowledge and Learning*, 171).

<sup>32</sup> “History and Dialectic in *Metaphysics* A 3,” 94–95, 99–101.

<sup>33</sup> The idea being that both involve replacing an interlocutor’s view with an improved version devised by the questioner (“History and Dialectic in *Metaphysics* A 3,” 101).

<sup>34</sup> Rossi also discusses the connection between *Top.* I.2 and *Met.* B, a connection, as she notes, that Alexander of Aphrodisias recognizes as well (“Going through *Aporiai*,” 226). She helpfully stresses that giving refutations is usually a way of raising *aporiai* rather than resolving them, and

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that a proper resolution will require a more systematic analysis of either side (“Going through *Aporiai*,” 240–45).

<sup>35</sup> For more on the aporetic context of *Met. B* and Plato’s *Parmenides* and *Sophist* see the contributions of Friedemann Buddensiek, Verity Harte and Lesley Brown respectively in *The Aporitic Tradition in Ancient Philosophy* edited by Vasilis Politis and George Karamanolis.

<sup>36</sup> Sameness and difference are the first of the so-called ‘greatest kinds’ discussed in the *Sophist* (254d4 and following), and similarity and dissimilarity are two principles that are picked out to be examined by the method of exploring both sides in the *Parmenides* (136b1–5). Aristotle also draws heavily on the *Parmenides* in his discussion of related puzzles in *Met. Γ2* as pointed out by Stephen Menn in section Iβ2 of his manuscript *The Aim and the Argument of Aristotle’s Metaphysics*.

<sup>37</sup> As discussed in sect. 1 above. While discussing the view that there are intermediate entities between forms and perceptibles, he says, “it would require a longer account to go through all the impossible consequences in this case” (τα συμβαίνοντα ἀδύνατα [998a9–10]).

<sup>38</sup> The exact number of *aporiai* (fourteen by one standard count: see, e.g. 1–2 of the Symposium Aristotelicum volume on *Met. B*), as well as where and how they are answered, is controversial. My contention that the book employs the method of exploring both sides, however, will not rely on any of these details.

<sup>39</sup> See *Met. A.1–2*, 982a1–6, where Aristotle suggests that wisdom is a science of certain causes and first principles.

<sup>40</sup> To my knowledge, Aristotle does not, nor do I think he would, characterize these meta-principles (that is, fundamental claims about the nature of the first principles) as first principles themselves. Since these meta-principles should be derivable from the first principles themselves, they should be considered as posterior to those principles in the order of explanation. If the first principles are instead seen as derivable from these meta-principles, then it is hard to see how the former would still qualify as prior and first in the order of explanation. That being said, I do think that the truth of these meta-principles is pursued with the goal of discovering what the first

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principles themselves are. Aristotle himself emphasizes the importance of sometimes looking to these meta-principles at the beginning of *EN* I.8. He ends I.7 by stressing that understanding principles is more than half the battle, then goes on to describe how one should examine them as follows: “One must conduct an examination about [a principle] not only on the basis of the conclusion and those things out of which an argument is constructed, but also from that which is said about the principle; for all the underlying facts harmonize with a truth, while the truth quickly clashes with a falsehood” (1098b9–12).

<sup>41</sup> Cf. *Parmenides* 135c5–136c8 where Plato has Parmenides describe the task of systematically applying the method of exploring both sides on a wide range of principles.

<sup>42</sup> Thus my understanding is in line with Allan Bäck’s general contention in “Aristotle’s Discovery of First Principles” that Aristotle should be interpreted as a fallibilist, willing to make constant adjustments based on explanatory considerations. It is also consistent with Bolton’s view that one use of dialectic for Aristotle is to test candidate principles based on their consistency with widely-held perceptual data (though keeping open the possibility of corrections based on further empirical evidence). See especially Bolton’s “The Epistemological Basis of Aristotelian Dialectic.”

<sup>43</sup> Bronstein stresses how explanatory considerations play a role in how we come to understand principles according to Aristotle (*Aristotle on Knowledge and Learning*, 57, 79, 123, 198, 241). Exploring both sides involves such considerations within a single application, but these will also come into play when comparing candidate principles already known to be true for their relative priority. On my view, the meta-principles in *Met. B* effectively rule out candidates that would not fit explanatory requirements for being *first*.

<sup>44</sup> Many thanks to Huw Duffy, Marc Gasser-Wingate, Colin King, Emily Kress, and Marko Malink for helpful suggestions on earlier versions of this paper, and especially to Katy Meadows and two anonymous reviewers for the *Journal of the History of Philosophy*. Special thanks as well to the organizers and attendees of the 2017 conference on Dialectic and Analytics in the

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