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## Aporia and exegesis: Alexander of Aphrodisias

Aporetic reasoning features in Alexander's work throughout - in the Aristotelian commentaries, opuscula, and school treatises (two of which have words *aporia* and *problêma* in their manuscript titles).<sup>1</sup> Much of Alexander's use of *aporia* is prompted by Aristotle's texts he comments on, and very often aporetic framework is developed in following upon the earlier school discussions and philosophical polemic against other philosophers - both practices going back to Aristotle himself. *Aporia* as a genre of Alexander's literary output is constantly receiving scholarly attention, and much still remains to be done.<sup>2</sup>

But in this paper it is not my goal to discuss an *aporia* as a genre in Alexander's literary work. Instead I would like to probe into a somewhat different area, that of Alexander's thinking about the *aporia* as a part of philosophical method. This is not an easy task, since despite the ubiquity of aporetic contexts in Alexander's work, there is no single place where we could find the statement of his views on this subject. His methodological position can be gauged from his commenting on the relevant texts in Aristotle. In what follows I look at his discussion of the usefulness of dialectical method for sciences and at an example of his exegesis of Aristotle's *aporiae* in first philosophy. I will conclude that Alexander has a well-defined role for the aporetic reasoning in the scope of scientific inquiry (section two), and moreover, that Aristotle's central metaphysical *aporiae* retain their system-building status in Alexander's own interpretation of Aristotle's system (section three). I will begin with a brief survey of Alexander's Aristotelian background in his methodological reflexion on *aporia*.

### 1. Aristotelian preliminaries: the form and scope of *aporia*

Arthur Madigan notes that in the commentary on *Metaphysics Beta*,

**(T<sub>1</sub>)** Alexander uses the term *aporia* in at least four senses: **[i]** a physical impediment to a movement in a certain direction (the original sense); **[ii]** a state of perplexity (the *aporia* in us); **[iii]** a problematic object or issue, such as to give rise to perplexity (the *aporia* in the thing); **[iv]** a philosophical discussion which seeks to clarify a problematic issue, and to relieve perplexity, by arguing on both sides of the issue.<sup>3</sup>

In the *Topics*, Aristotle criticises the definition of *aporia* as equality of opposite arguments<sup>4</sup> as ill-formed, because it suggests that *aporia* is a condition (*πάθος*) of the arguments, whereas it is a condition of the soul. Aristotle says that the *aporia* is caused by the equality

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<sup>1</sup> *Quaestiones* (Ἀπορίαι καὶ λύσεις σχολικαὶ φυσικαὶ) and *Ethical Problems* (Ἠθικὰ προβλήματα).

<sup>2</sup> This work was started already by Ivo Bruns, the editor of Alexander's school treatises in the CAG supplement who developed a classification of the school treatises into several classes (Bruns 1982, V-XIV, see Sharples 1992, 4-7). See also Sharples 1987, 1990, 1994, 2004, 2008, Fazzo 2001.

<sup>3</sup> Madigan 1992, 87n3.

<sup>4</sup> ἡ ἀπορία ἰσότης ἐναντίων λογισμῶν (*Top.* 6.6 (145b1-2)). Düring seems to suggest that the definition goes back to Plato, but does not give a parallel (Düring 1968, 212).

of opposite arguments, ‘for when we are reasoning *in utramque partem* and everything on each side seems to us similar, we have a difficulty as to which way to act’.<sup>5</sup>

Alexander elaborates on this explanation as follows:

**(T2) (1)** But neither is it the case that the *aporia* is productive of the contrary arguments, but rather the other way around. **(2)** For the *aporia* is a kind of affection of thought which occurs due to the contrariety of arguments. **(3)** For when we are considering and scrutinising two contrary arguments as to which one seems more fitting, and it appears to us that equality and similarity and in being both ways belongs to each of them, then this kind of affection arises. **(4)** For instance, when [a question] has been proposed whether the soul is immortal or mortal, and the arguments undertaken for each case prove both [the positions] sought by the arguments, and with strong demonstrations, in that case an *aporia* arises, which part should be sided with. **(5)** So, when all [parts] seem strong and similar to such an extent as to have a difficulty which of the parts should rather be taken, there is an *aporia*.<sup>6</sup>

Here Alexander focuses on *aporia* as a psychological state **[ii]** and distinguishes this state from that which causes it, as prompted by Aristotle’s context, namely the discussion of definitions. Outside this context, however, neither Aristotle nor Alexander aim to reduce the *aporia* to a psychological state leaving outside the question of its specific cause. In *Metaphysics Beta*, Aristotle uses the terminology of *aporia* to refer not only to the psychological state of perplexity, but also to its specific cause, the underlying conceptual difficulty. Alexander’s usage in the commentary follows that of Aristotle, and the description of the *cause* of psychological *aporia* in **(T2)** is referred to as *aporia* in the meaning **[iii]** of Madigan’s list, ‘a problematic object or issue’.

Aristotle outlines the progressive, dynamic structure of a complete aporetic argument. This is what Aristotle, and Alexander, also called ‘*aporia*’, in Madigan’s sense **[iv]**. Aristotle distinguishes three key points within this structure. First there is an *aporia* proper: the original perplexity, which includes both the state of the soul and its cause, the difficulty with regard to the subject matter. Aristotle compares the objective difficulty with a knot or an obstacle which must be known by anyone who wants to make a progress.<sup>7</sup> In the first book of *Metaphysics* Aristotle famously speaks of the state of ‘wonder and

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<sup>5</sup>145b16-20: ὁμοίως δὲ καὶ τῆς ἀπορίας δόξειεν ἂν ποιητικὸν εἶναι ἢ τῶν ἐναντίων ἰσότης λογισμῶν· ὅταν γὰρ ἐπ’ ἀμφοτέρω λογιζόμενοις ἡμῖν ὁμοίως ἅπαντα φαίνηται καθ’ ἑκάτερον γίνεσθαι, ἀπορουμένον ὁπότερον πράξωμεν.

<sup>6</sup> Alexander *in Top.* 458, 26 - 459, 3: **(1)** ἀλλ’ οὐδὲ ἡ ἀπορία ποιητικὴ ἐστὶ τῶν ἐναντίων λογισμῶν ἀλλὰ τὸ ἀνάπαλιν· ἐστὶ γὰρ ἡ ἀπορία πάθος τῆς διανοίας δι’ ἐναντιότητα λογισμῶν ἐπιγινόμενη. ὅταν γὰρ ἐπὶ δυοῖς λογισμοῖς ἐναντίοις σκοποῦσι καὶ ἐξετάζουσιν ἡμῖν, ποῖος μᾶλλον ἀρμόδιος φαίνεται, ἰσότης καὶ ὁμοιότης καὶ ἐπ’ ἀμφοτέροις καθ’ ἑκάτερον φαίνηται, τὸ τοιοῦτον πάθος γίνεται. οἷον προτεθέντος εἰ ἢ ψυχὴ ἀθάνατος ἢ θνητὴ, καὶ ληφθέντων καθ’ ἑκάτερον λόγων δεικνύντων καὶ ἄμφω τὰ ζητούμενα λόγοις καὶ ἀποδείξεσιν ἰσχυραῖς, τότε γίνεται ἀπορία, ποῖω τῶν μερῶν δεῖ προστεθῆναι. ὅταν οὖν πάντα ἰσχυρὰ φαίνηται καὶ ὅμοια τοσοῦτον ὥστε καὶ ἀπορεῖν τίνος τῶν μερῶν ἔσται μᾶλλον λῆψις, ἀπορία ἐστίν.

<sup>7</sup> *Meta.* 3.1, 995a28-33: ἡ γὰρ ὑστερον εὐπορία λύσις τῶν πρότερον ἀπορουμένων ἐστὶ, λύειν δ’ οὐκ ἐστὶν ἀγνοοῦντας τὸν δεσμόν, ἀλλ’ ἡ τῆς διανοίας ἀπορία δηλοῖ τοῦτο περὶ τοῦ πράγματος· ἢ γὰρ ἀπορεῖ, ταύτη παραπλήσιον πέπονθε τοῖς δεδεμένοις· ἀδύνατον γὰρ ἀμφοτέρως προελθεῖν εἰς τὸ πρόσθεν.

perplexity' as the starting point of a philosophical investigation, which should disappear in the end when things become explained.<sup>8</sup>

The next structural point is described as *diaporia*. The term might suggest a process of dwelling on the original aporia, but Aristotle seems to have in mind a much more precise technical procedure of identifying and presenting the logical form of the aporetic argument, and spelling out the difficulties in this logical framework.<sup>9</sup> This framework typically includes the two competing claims (thesis and antithesis), and two respective series of arguments *pro* and *contra*.<sup>10</sup> The examples of such a fully-fledged argument form can be found in the fifteen aporiai of *Metaphysics Beta* and throughout the corpus.<sup>11</sup> The opposition of the arguments underlying the aporia has to be sufficiently stable and well-founded, caused by a true puzzle and not a result of a mere oversight or a simple mistake that can be easily corrected.<sup>12</sup> The aporia should also be distinguished from a verbal paradox or a sophism, where a solution comes as a matter of logical technique.<sup>13</sup> On both Aristotle's and Alexander's view, the impression of equipollence produced by the aporetic argument cannot reflect the truth of the matter in question and must instead be taken as signalling a problem to be dealt with by a philosopher.

Thus, finally, the aporetic reasoning must include the stage of *euporia*, when a solution, 'passage' or discovery of conceptual resources sought, has been obtained. At this stage, the initial sense of surprise and difficulty should disappear. As Aristotle says, it should become more surprising if it turns out that things are different from the way they are.<sup>14</sup> There is no uniform method of attaining the euporia, and there is no single type of solution in Aristotelian science.<sup>15</sup> Still there is a robust expectation that the aporia will be solved once we find a way of thinking about the object which will avoid all the shortcomings and

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<sup>8</sup> *Meta*.1.2, 982b11-21: "Ὅτι δ' οὐ ποιητική, δῆλον καὶ ἐκ τῶν πρώτων φιλοσοφησάντων· διὰ γὰρ τὸ θαυμάζειν οἱ ἄνθρωποι καὶ νῦν καὶ τὸ πρῶτον ἤρξαντο φιλοσοφεῖν, ἐξ ἀρχῆς μὲν τὰ πρόχειρα τῶν ἀτόπων θαυμάσαντες, εἶτα κατὰ μικρὸν οὕτω προϊόντες καὶ περὶ τῶν μειζόνων διαπορήσαντες, οἷον περὶ τε τῶν τῆς σελήνης παθημάτων καὶ τῶν περὶ τὸν ἥλιον καὶ ἄστρα καὶ περὶ τῆς τοῦ παντὸς γενέσεως. ὁ δ' ἀπορῶν καὶ θαυμάζων οἴεται ἀγνοεῖν (διὸ καὶ ὁ φιλόμυθος φιλόσοφος πῶς ἐστίν· ὁ γὰρ μῦθος σύγκειται ἐκ θαυμασίων)· ὥστ' εἴπερ διὰ τὸ φεύγειν τὴν ἀγνοίαν ἐφιλοσόφησαν, φανερὸν ὅτι διὰ τὸ εἰδέναι τὸ ἐπίστασθαι ἐδίωκον καὶ οὐ χρήσεώς τινος ἔνεκεν.

<sup>9</sup> For this understanding, see Aubenque 1961, Laks 2009, 28-29; Crubellier 2009, 49.

<sup>10</sup> It can be compared, *mutatis mutandis*, with the structure presupposed by the method of hypothesis in Plato's *Meno* (86E-87C) and the dialectical method in *Parmenides* (135E-136D).

<sup>11</sup> We can also find examples of 'abbreviated' aporetic arguments, with only the most important opposing considerations presented explicitly. This is more characteristic of the 'empirical' or 'internal' aporiai which arise with respect to various positions of an Aristotelian theory which seem to be contradicted by experience or other weighty considerations.

<sup>12</sup> Irwin speaks of 'objective' aporiae, Irwin 1988, 41.

<sup>13</sup> In the *Topics*, Aristotle distinguishes the dialectical from the eristic syllogism because the former is a valid argument which starts with endoxic premisses, whereas the latter starts from the premisses which only appear to be endoxic without being such, and may be an apparent rather than valid syllogism. (*Top*.1.1, 100b23-101a5)

<sup>14</sup> *Meta*.1.2, 983a11-21.

<sup>15</sup> Pierre Aubenque gave a preliminary classification of different types of euporia in Aristotle: (i) euporia is a solution proper which eliminates the difficulty and replaces it with a positive theory (an example is the discussion of akrasia in EN 7); (ii) euporia is a plausible hypothesis which is in principle open to revision; (iii) euporia preserves some elements of truth that are contained in both the thesis and antithesis; (iv) it is accepted from start that aporia does not have a definitive solution, and the solutions that are accepted are provisional because such is the nature of the 'eternal' question (Aubenque 1961, 14-17).

limitations of the two opposing positions. Hence the role of *aporia* in sciences is seen primarily as a conceptual framework which allows us to study *all* the shortcomings and limitations, as well as all the more promising elements in the *aporetic* arguments.

## 2. *Aporia* and scientific method

According to Aristotle's theory of science developed in the logical corpus, the scientific method of reasoning is demonstration or scientific deduction. It involves the application of a valid deductive procedure<sup>16</sup> to a properly defined subject genus in order to derive the proper attributes of this genus on the basis of the axioms.<sup>17</sup> The premisses of demonstration are true and primary, immediate, better known than the terms of the conclusion, and have an explanatory priority to the conclusion.<sup>18</sup> The first principles of any science are indemonstrable, i.e. they cannot be derived from any more fundamental principles.<sup>19</sup>

Demonstrative reasoning is distinguished from dialectical reasoning, which is based on the approved or reputable (*endoxic*) premisses entertained by the two participants of a dialectical argument, the 'questioner' and the 'answerer'.<sup>20</sup> These *endoxic* premisses may or may not be true. The reasoning used by a dialectician to arrive at a conclusion from *endoxic* premisses is deductive. Apart from deduction, Aristotle's dialectic presupposes the use of inductive reasoning,<sup>21</sup> and although Aristotle's discussion of it in the *Topics* is tantalisingly terse, Alexander fully accepts it, understanding it as a regular part of a dialectical method along with the arguments based on *endoxic* premisses (we shall see an example of his use of both methods shortly below).

The aim of the 'questioner' is to get the 'answerer' to accept a particular conclusion (for instance, a claim which will make the answerer's position inconsistent and thus disprove his argument).<sup>22</sup> The strategy of the answerer is to maintain the consistency of his position as far as possible and not yield to a refutation,<sup>23</sup> i.e. be careful when granting agreements to the questioner's proposed claims (*protaseis*).<sup>24</sup>

The goal of demonstration is truth, the goal of dialectical reasoning is persuasion. The scientist has to ensure that the starting points of his demonstration are true and appropriate to the subject genus of his science. The dialectician, unlike the scientist, is not restricted in his choice of premisses: he can examine any thesis in any discipline and he can argue for the opposite theses. The fully-fledged *aporetic* structure, with two opposing arguments, can be an illustration of a dialectical argument conducted on both sides, without any truth-constraints for the premisses.

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<sup>16</sup> For the meanings of *sylogismos* in Aristotle, see Barnes 1982. Here we can use the definition of *Top.* 1.1, where *sylogism* is defined along the lines of the modern valid argument.

<sup>17</sup> *An. Post.* 1.10, 76b11-16

<sup>18</sup> *An. Post.* 1.2, 71b19-23.

<sup>19</sup> *An. Post.* 1.2, 71b26-29.

<sup>20</sup> The importance of this 'double-sided' structure of a dialectical argument is brought out in Smith 1993.

<sup>21</sup> Aristotle, *Top.* 1.12

<sup>22</sup> *Top.* 1.10, 104a8-12, see discussion in Smith 1993, 337-8.

<sup>23</sup> *Top.* 1.1, 100a18-21.

<sup>24</sup> Alexander's explanation of Aristotle's definition of dialectic in the *Topics* commentary does full justice to the roles of questioner and answerer. Alexander *in Top.* 3, 4-24.

The question of the place of dialectic in Aristotle's methodology of science is controversial. That it must have *some* place is suggested by the overall structure of Aristotle's argument in many works where the study of the subject matter has as its starting point the analysis of the difficulties which arise from authoritative endoxic claims.<sup>25</sup> This might suggest that dialectic after all does form a regular part of Aristotle's scientific methodology. But such an inclusive understanding of the role of dialectic seems to clash with the *Organon* view of scientific reasoning as strictly demonstrative. It is not my goal to discuss the whole debate about the role of dialectic and aporetic reasoning in Aristotelian science,<sup>26</sup> but I shall try to outline Alexander's position.

On Alexander's view, every science, including first philosophy, is demonstrative and definitional. This pretty much rules out dialectic as a scientific method proper.<sup>27</sup> Still, Alexander takes very seriously Aristotle's remarks in the *Topics* detailing the ways in which dialectic is useful for philosophy.<sup>28</sup> Dialectic makes it easier to see on which side the truth is, 'just as the judge comes to know what is right through listening to both parties',<sup>29</sup> and the person who has argued on both sides will not be led astray by what is persuasive, and is in the best position to see the solution to the puzzles.<sup>30</sup> The most detailed and technical is the discussion Alexander devotes to the last point: dialectic contributes towards the first principles.<sup>31</sup>

**(T3) (1)** What he adds is to say that dialectic is useful also with a view to the principles in each science: **(2)** for no science can argue about its proper principles, because if one would speak scientifically about these and prove them, he has to prove them from first things - this is the nature of scientific and demonstrative proof - but one does not have any such first thing prior to the principles. **(3)** So these principles of sciences *which need to be provided with some confirmation* must, because they cannot be proved through what is true and primary, be proved and justified through what is approved - and syllogising through this is a distinctive property of dialectic. **(4)** Another distinctive property of it, as Aristotle will go on to say, is to provide a confirmation for the point at issue through induction; and principles come to be justified most through induction. **(5)** So the scientist will speak of the principles proper to his science as a dialectician or the dialectician will do this on his behalf. **(6)** And if dialectic is useful with a view to the first things, the principles

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<sup>25</sup> See Owen 1961.

<sup>26</sup> The literature is huge. For the argument for 'strong' dialectic as the method of Aristotle's first philosophy, see Irwin 1988, cf. Barnes 1991. For the argument that demonstration is the method of first philosophy, see Bell 2004.

<sup>27</sup> On Alexander's interpretation of first philosophy as demonstrative science, see Bonelli 2005.

<sup>28</sup> *Top.* 1.2, 101a25-b5.

<sup>29</sup> *In Top.* 29, 30-31.

<sup>30</sup> *In Top.* 30, 5-16.

<sup>31</sup> My interpretation of Alexander differs from that of Smith, who relies on Alexander's construal of the phrase in *in An. Pr.* 293, 6-10, but does not seem to take into account his discussion of geometrical examples in the *Topics* commentary (Smith 1993, 349-354).

of each science, it will be so, as Aristotle says, for philosophy and its principles as well, providing its usefulness there too. (trans. van Ophuijsen, lightly modified) <sup>32</sup>

Both the utility of dialectic **(T3.1)** and the indemonstrability of the first principles **(T3.2)** are Aristotelian points. Alexander's expression 'which need to be provided some confirmation' in **(T3.3)** may require a disambiguation. In the Greek phrase τὰς οὖν δεομένας τῶν ἀρχῶν τῶν κατὰ τὰς ἐπιστήμας συστάσεώς τινος the participle δεομένας could be understood attributively, and then the phrase would imply that all the first principles of science are in need of some confirmation, since no confirmation can be provided by the science itself, which has no further foundation beyond the first principles themselves.<sup>33</sup> The force of the partitive genitive construction will be to isolate the *proper indemonstrable* principles as the subclass whose characteristic feature is this need of a certain dialectical foundation. On this reading, the role of dialectic in science, as outlined in **(T3.5)**, would be understood along the lines suggested by Terry Irwin's interpretation of Aristotle: the 'strong dialectic' would set a kind of scientific discourse supplementary to demonstration, providing a second-order justification to the first principles of science which cannot be demonstrated.<sup>34</sup>

There is another possibility, however, and I will argue that it is the one that Alexander has in mind in his discussion of dialectic, both here and in the *Metaphysics Beta* commentary. If we take the participial construction in **(T3.3)** as predicative and circumstantial, to mean 'in case where they need some kind of confirmation', the need for confirmation will be dictated by circumstances, such as the necessity to respond to a dialectical objection. In this case the partitive construction will be isolating not the proper indemonstrable principles as a subclass of all the principles, but very specifically the principles which happen to be in need of some corroboration, for instance, when they are under attack by opponents or critics. It is in this case that dialectic can be helpful in both defending the principles and at the same time showing 'the way' towards them starting from the endoxic premisses. None of these helpful roles amounts to establishing the principles.

The battery of examples that follows in Alexander's commentary seems to me to give support to this reading. Alexander gives two kinds of example to show how dialectical reasoning can provide confirmation to the principles that need it. The first example is showing that there are some things in philosophy that require a dialectical proof. It comes from Aristotle's *Physics* 3.5, where Aristotle argues against the existence of the infinite body.<sup>35</sup> Alexander gives his own interpretation of Aristotle's argument.

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<sup>32</sup> (1) ἔστι δὲ ὁ προστίθησι· χρήσιμόν φησιν εἶναι τὴν διαλεκτικὴν καὶ πρὸς τὰς καθ' ἑκάστην ἐπιστήμην ἀρχάς· (2) περὶ γὰρ τῶν οἰκείων ἀρχῶν οὐδεμία τῶν ἐπιστημῶν οἷα τε λέγειν διὰ τὸ δεῖν μὲν, εἰ ἐπιστημονικῶς λέγοι περὶ αὐτῶν καὶ δεικνύοι ταῦτα, ἐκ πρώτων αὐτὰ δεικνύναι (τοιαῦτα γὰρ αἱ ἐπιστημονικαὶ τε καὶ ἀποδεικτικαὶ δεῖξεις), μηδὲν δὲ ἔχειν τῶν ἀρχῶν πρῶτον. (3) τὰς οὖν δεομένας τῶν ἀρχῶν τῶν κατὰ τὰς ἐπιστήμας συστάσεώς τινος τῷ μὴ δύνασθαι δεῖκνυσθαι δι' ἀληθῶν τε καὶ πρώτων δι' ἐνδόξων τινῶν <δεῖ> δεῖκνυσθαι τε καὶ πιστοῦσθαι· τὸ δὲ διὰ τοιούτων συλλογίζεσθαι διαλεκτικῆς ἴδιον. (4) ἴδιον δὲ αὐτῆς καὶ ἡ δι' ἐπαγωγῆς τοῦ προκειμένου σύστασις, ὡς προῖων ἐρεῖ· μάλιστα δὲ τὸ πιστόν ταῖς ἀρχαῖς δι' ἐπαγωγῆς περιγίνεται. (5) ὡς διαλεκτικὸς οὖν περὶ τῶν ἀρχῶν τῶν ἰδίων ὁ ἐπιστημῶν ἐρεῖ, ἢ ὁ διαλεκτικὸς ὑπὲρ αὐτοῦ. εἰ δὲ πρὸς τὰ πρῶτα καὶ τὰς καθ' ἑκάστην ἐπιστήμην ἀρχάς ἐστι χρήσιμος, εἶη ἄν, ὡς εἶπε, καὶ πρὸς φιλοσοφίαν τε καὶ τὰ ταύτης ἀρχάς, παρεχομένη καὶ ταύτη τὸ χρήσιμον.

<sup>33</sup> Van Ophuijsen's translation renders σύστασις throughout as 'foundation', which may give additional weight to this reading.

<sup>34</sup> Irwin 1988, 196-198.

<sup>35</sup> *Phys.* 3.5, 204a34-b22, at b4-10.

**(T4) (1)** Aristotle himself often when proving things in philosophy, adds ‘logically’ in the sense of ‘dialectically’, implying that there are also things in philosophy that require this kind of proof. **(2)** An example of such [proof] is as follows: **(3) [P1]** *Every body is delimited by a surface.* **(4)** This is something approved, since it has been posited that *a surface is the limit of a body.* **(5)** Aristotle used [this premiss, viz. **[P1]**] in his *Physics* to show that there is no unlimited body.<sup>36</sup> By adding to this that **(6) [P2]** *Nothing which is delimited is unlimited* he has deduced that **(7) [C]** *Therefore: no body is unlimited.*<sup>37</sup> (trans. van Ophuijsen, lightly modified)

On Alexander’s interpretation at **(T4.1)**, by ‘verbal’ Aristotle means ‘dialectical’ understood here as ‘proceeding from the endoxic premisses’. Aristotle in *Physics* says nothing about this condition for premisses, and draws a distinction rather between the ‘logical’ and ‘physical’ arguments, along the lines of a familiar discussion of the two definitions of anger in *De anima*.<sup>38</sup> In fact, it seems that Alexander struggles to explain why **[P1]** above is endoxic. His solution in **(T4.3)** is to say that it derives from a common formula ‘a surface is the limit of the body’, which is criticised by Aristotle himself in *Topics* 6.4 as less scientific, because it defines things prior ‘without qualification’ through things posterior without qualification.<sup>39</sup> Aristotle in *Physics* 3.5 has nothing to say about this derivative endoxon. Premiss **[P2]** is supplied by Alexander to derive the conclusion **(7) [C]**, namely that ‘no body is unlimited’.<sup>40</sup>

The dialectical context of this argument in Aristotle’s *Physics* is defined by the Pythagorean theory of separate infinite, which is discussed immediately before this argument. The argument itself thus can be construed as a necessary response to the opposite argument, within a well-formed dialectical framework.<sup>41</sup>

Next follows a series of arguments showing how dialectic discusses the first principles, for the geometrical definitions. Geometry faces the objection that it is impossible for there to be magnitudes with only two dimensions (surfaces), only one dimension (lines), no dimensions at all (geometrical points), and it is impossible for us to conceive of such magnitudes.

**(T5) (1)** That it is the task of the dialectician to speak about principles can be made plain from the following. **(2)** The geometrician posits as principles of geometry that **(a)** *surface is that which has length and width only*, and also posits that **(b)** *a line is a length without width*, and that **(c)** *a point is that which has no part.* **(3)** Some people object to this, saying that **(a)** it is not possible for

<sup>36</sup> Aristotle, *Phys.* 204b5-7: εἰ γὰρ ἐστὶ σώματος λόγος τὸ ἐπιπέδῳ ὠρισμένον, οὐκ ἂν εἶη σῶμα ἄπειρον, οὔτε νοητὸν οὔτε αἰσθητὸν

<sup>37</sup> *In Top.* 30, 12-18: **(1)** καὶ αὐτὸς δὲ πολλάκις δεικνύς τινα τῶν κατὰ φιλοσοφίαν προστίθησι τὸ “λογικῶς” λέγων διαλεκτικῶς, ὡς δεομένων τινῶν τῶν κατὰ φιλοσοφίαν καὶ τοιούτων δείξεων. **(2)** οἷα ἐστὶ καὶ ἡ τοιαύτη· πᾶν σῶμα ἐπιπέδῳ ὠρισταί, **(3)** ὃ ἐστὶν ἔνδοξον διὰ τὸ κείσθαι σώματος πέρας εἶναι τὴν ἐπιφάνειαν, ᾧ ἐχρήσατο ἐν Φυσικοῖς δεικνύς ὅτι μὴ ἔστιν ἄπειρόν τι σῶμα· **(3)** ᾧ προσθεῖς τὸ ‘οὐδὲν δὲ ὠρισμένον ἄπειρον’ **(4)** ‘οὐδὲν ἄρα σῶμα ἄπειρον’ συνήγαγεν.

<sup>38</sup> *De anima* 1.1, 403a27-b19.

<sup>39</sup> Aristotle, *Top.* 6.4, 141b15-28. Aristotle notes that these definitions are very commonly used. Brunschwig ad loc. cites as an example a definition of shape as a limit of the solid in the *Meno* 76A. See Brunschwig 2007, 217n2.

<sup>40</sup> In Simplicius’ *Physics* commentary ad loc., the two interpretations are amalgamated, so that the ‘verbal’ argument is presented as ‘dialectical’, and ‘physical’ as demonstrative. The ‘verbal’ argument is said to proceed from the endoxic premisses, but also to be the most common. Although at this particular point Simplicius does not cite Alexander, given the dependence of his commentary on Alexander’s, one might wonder whether Alexander is not his source for this interpretation of ‘logical’/‘physical’ distinction.

<sup>41</sup> Aristotle, *Physics* 3.5, 204a8-34. Simplicius construes the argument as a response to Pythagoreans (*in Phys.* 475, 11-19)

a magnitude to have only two dimensions, **(b)** still less to have only one, and **(c)** that there is no such thing as point at all, since **(i)** there is nothing that will neither diminish what it is taken from nor increase what it is added to, as Zeno of Elea said, **(ii)** for one cannot even form an image of what is without dimension. **(4)** Now it is not possible to offer a geometrical proof that any of these are real, **(5)** but the dialectician will have no difficulty in providing a confirmation for them through things approved. **(6)** For having obtained that **[P1]** *Surface is the limit of the body* which is approved, and that **[P2]** *A limit is other than that which it is a limit of* and **[I1]** having provided a confirmation for this by induction, he deduces that **[C1]** *Surface is other than body*, i.e. that what has three dimensions; and if it is other than that, **[C2]** *it cannot have three dimensions*, since if it did it would be the same as body, for having three dimensions is what body has its being in. **(7)** However, **[I2]** *surface is seen to have length and width; therefore it cannot have depth; therefore it [C3] has just the two dimensions.*<sup>42</sup>

The opening formula ‘to speak about principles’ (τὸ περὶ ἀρχῶν λέγειν) in **(T5.1)** is general enough to suggest that for Alexander dialectic is a special science of the first principles. However the argument that follows shows something rather different: the role of dialectic consists in answering the philosophical or sceptical objections against the geometrical principles. Alexander’s exact sources for this whole argument are difficult to track down. The principles listed in **(T5.2)** are post-Aristotelian and correspond verbatim to the Euclidean definitions.<sup>43</sup> The complex objection of the critics of geometry **(T5.3)** can be related to a long tradition going back from Sextus Empiricus through the Epicureans, Stoics, possibly earlier Pyrrhonists, to Protagoras, and the Eleatics.<sup>44</sup> The objection points up the inconsistency between the physical concept of magnitude and the geometrical concepts of point, line, surface. We don’t have any further information about the position of Alexander’s challenger: it can be a dialectician, sceptic, or a corporealist of some sort. The two arguments are spelled out for the case of point: (i) it is unsound: that which cannot contribute to the increase or diminution [of a physical magnitude] does not exist, and (ii) it is inconceivable because it lacks extension. The same arguments *mutatis mutandis* are implied for the lines and surfaces. We shall consider Alexander’s argument in defense of surfaces, focussing on its form and function.

In a nutshell, Alexander argues that the concept of surface as distinct from body that is used by geometers is both sound and conceivable. Alexander says in **(T5.6)** that a dialectician obtains (presumably from the interlocutor) two premisses: one of them **[P1]** is a familiar ‘less scientific’ definition of a surface as a limit of body, and another **[P2]** is an analytical statement that limit is other than the body.

<sup>42</sup> *In Top.* 30, 18-31,4: **(1)** ὅτι δὲ διαλεκτικοῦ ἐστὶ τὸ περὶ ἀρχῶν λέγειν, ἐντεῦθεν δὴλον ἂν γένοιτο. **(2)** ὁ γεωμέτρης τίθεται μὲν ἐν ταῖς ἀρχαῖς καὶ τὸ ἐπιφάνειαν εἶναι ὃ μῆκος καὶ πλάτος μόνον ἔχει, τίθεται δὲ καὶ γραμμὴν μῆκος ἀπλατέες, καὶ σημεῖον οὐ μέρος οὐδέν. **(3)** ἐνίστανται δὲ πρὸς ταῦτά τινες λέγοντες **(a)** μήτε τι μέγεθος δύνασθαι διαστήματα δύο ἔχειν μόνα, **(b)** ἔτι δὲ ἦττον ἔν. **(c)** ἀλλὰ μηδὲ σημεῖον τι ὅλως εἶναι. **(d)** μηδὲν γὰρ εἶναι ὃ μήτε ἀφαιρούμενον μειοῖ τι μήτε προστιθέμενον αὔξει, ὡς ὁ Ἐλεάτης ἔλεγε Ζήνων· ἀδιαστάτου γὰρ μηδὲ φαντασίαν τινὰ δύνασθαι λαβεῖν. **(4)** γεωμετρικῶς μὲν οὖν οὐχ οἶόν τέ τι τούτων ὡς ὃν δεῖξαι. **(5)** ὁ δὲ διαλεκτικὸς οὐκ ἀπορήσει δι’ ἐνδόξων αὐτὰ συστήσαι. **(6)** λαβὼν γὰρ ἔνδοξον τὸ τὴν ἐπιφάνειαν πέρασ εἶναι τοῦ σώματος καὶ τὸ τὸ πέρασ εἶναι ἄλλο τοῦ οὐ ἐστὶ πέρασ, καὶ τοῦτο τῇ ἐπαγωγῇ συστήσας συνάγει τὴν ἐπιφάνειαν ἄλλην εἶναι σώματος, τοῦτ’ ἐστὶ τοῦ τριχῆ διεστώτος· εἰ δὲ ἄλλη, οὐχ οἶόν τε ἔχειν αὐτὴν διαστάσεις τρεῖς· ἦν γὰρ ἂν οὕτως ἢ αὐτὴ τῷ σώματι· ἐν τούτῳ γὰρ ἐκείνῳ τὸ εἶναι· ἀλλὰ μὴν ὁράται μῆκος καὶ πλάτος ἔχουσα· ἀδύνατον ἄρα αὐτὴν βάθος ἔχειν· τὰς δύο ἄρα μόνας ἔχει διαστάσεις, μῆκος καὶ πλάτος.

<sup>43</sup> *Elem. Defs.* I 1,2,5.

<sup>44</sup> On Sextus and his Hellenistic sources, see Mueller 1982, Dye & Vitrac 2009. For Protagoras’ criticism of geometry, see Aristotle, *Meta.* 3.2, 997b35-998a6, Alexander *in Meta.* 200, 18-21. Alexander’s quotation from Zeno in **(T5.3.i)**, may be taken by him from Eudemus’ Physics commentary: see Simplicius in *Phys.* 138,29-139,2.

The reference to the inductive confirmation at this point is instructive: it seems to take care of the ‘conceivability’ argument, since Alexander places a very high value on the inductive arguments in dialectical reasoning. In this particular argument he may be making use of Aristotle’s defense of geometrical objects. Sextus reports that Aristotle defended the geometrical definition of *line* against a criticism similar to our **(T5.3b)** in an argument ‘by privation’ (στέρησις) with the help of an illustration from ordinary experience:

**(T6) (1)** yet Aristotle affirms that the length without breadth they talk of is not inconceivable but can come into our minds without any difficulty. **(2)** He bases his argument on an obvious and clear example. **(3)** “Thus we perceive the length of a wall, he says, without thinking simultaneously of its breadth, and therefore it will be possible also to conceive of the “length without any breadth” talked of by the Geometers, seeing that “things evident are the vision of things non-evident”;<sup>45</sup> **(4)** but he is in error, or perhaps humbugging us. **(5)** For whenever we conceive the length of the wall without breadth, we do not conceive it as wholly without breadth but without the breadth which belongs to the wall. And thus it is possible for us by combining the length of the wall with a certain amount, however small, of breadth to form a conception of it; so that in this case the length is perceived not without any breadth at all, as the Mathematicians claim, but without this particular breadth. **(6)** But Aristotle’s problem was to prove not that the length talked of by the Geometers is devoid of a certain breadth, but that it is wholly deprived of breadth; and this he has not proved.<sup>46</sup>

Alexander in **(T5.6)** seems to be using the same strategy of arguing from privation. However, he does not rely on induction for indicating the scope of privation: this scope is taken to be universal in the second premiss **[P2]**: a limit is other than that which it limits. The inductive argument is supposed to support the endoxic premisses. Alexander does not flesh out the inductive argument, but only outlines its place in the structure of the whole.<sup>47</sup> Thus, the valid deduction from **[P1]** and **[P2]** gives us a conclusion **[C1]** that surface is other than the body. It is as sound as a proper conclusion supported by very credible (if not true) premisses can be. Then it is easy to derive a corollary **[C2]** that surface cannot have three dimensions, and using it again as premiss in combination with the second inductive argument **[I2]**, viz. everyone can see that a surface has two dimensions, it is possible to establish a valid conclusion **[C3]** that surface has only two dimensions. Once again, the conclusion is very credible and derived by a valid deductive procedure. It cannot be considered a truth of geometry, but it is useful for geometry because it helps justify its theoretical project and defend it from criticisms. So dialectical method does not form a part of method in geometry, but dialectic ‘has a way’ to the principles of geometry. This is

<sup>45</sup> Aristotle fr. 29 Rose.

<sup>46</sup> (1) φησὶ μὴ ἀδιανόητον εἶναι τὸ ὑπὸ τούτων λεγόμενον μῆκος ἀπλατές, ἀλλὰ δύνασθαι χωρὶς πάσης περισκελείας εἰς ἔννοιαν ἡμῖν ἐλθεῖν. (2) ἴστησι δὲ τὸν λόγον ἐπὶ τινος ἐναργεστέρου ὑποδείγματος καὶ σαφοῦς. (3) τὸ γοῦν τοῦ τοίχου μῆκος, φησὶ, λαμβάνομεν μὴ συνεπιβάλλοντες αὐτοῦ τῷ πλάτει, διόπερ ἐνέσται καὶ τὸ παρὰ τοῖς γεωμέτραις λεγόμενον μῆκος χωρὶς πλάτους τινὸς ἐπινοεῖν, ἐπεὶ περ ὅψις τῶν ἀδήλων ἐστὶ τὰ φαινόμενα, (4) πλανώμενος ἢ τάχα κατασοφίζομενος ἡμᾶς. (5) ὅταν γὰρ τὸ τοίχου μῆκος χωρὶς πλάτους νοώμεν, οὐ χωρὶς παντὸς πλάτους αὐτὸ νοοῦμεν, ἀλλὰ χωρὶς τοῦ περὶ τῷ τοίχῳ καθεστῶτος πλάτους. ὅθεν καὶ ἐνδέχεται συμπλέξαντας τὸ τοῦ τοίχου μῆκος τινὶ πλάτει καὶ ὀψιδοποιεῖν νόησιν αὐτοῦ ποιεῖσθαι· ὥστε μῆκος λαμβάνεσθαι τὰ νῦν οὐ χωρὶς παντὸς πλάτους, καθάπερ ἀξιούσιν οἱ ἀπὸ τῶν μαθημάτων, ἀλλὰ χωρὶς τοῦδε τινὸς πλάτους. (6) προύκειτο δὲ τῷ Ἀριστοτέλει παραστήσαι οὐχ ὅτι τινὸς πλάτους ἀμοιρεῖ τὸ κατὰ τοὺς γεωμέτραις λεγόμενον μῆκος, ἀλλ’ ὅτι παντὸς ἐστέρηται πλάτους· ὅπερ οὐκ ἀπέδειξεν.

<sup>47</sup> It is tempting to see Alexander’s argument as refining on Aristotle’s response to the criticism of a geometrical definition, but more evidence is needed. Ian Mueller notes the use of a similar argument in a later geometrical tradition by Apollonius of Perga and [Hero]. Mueller 1982, 80. Apollonius apud Proclum *in Eucl.* 100, 6-10; [Hero] *Deff.* 16.9-16.

what dialectic does with regard to the first principles of all sciences, including the first philosophy.

Since the context of a dialectical argument is a debate against the opponents it might be legitimate to ask a question: would Alexander be able to win this dialectical joust against a Sceptic, or an Epicurean, or a Stoic? Does Aristotelian dialectic compete effectively against persuasive strategies developed by other philosophical schools? Aristotle in *Topics* 1.3 says that the mastery of dialectical method is similar to that of medicine and rhetoric: it is impossible to develop a winning strategy that would suit *all* individual circumstances, but the method presupposes that none of the winning opportunities that depend on the dialectician have been omitted.<sup>48</sup>

Alexander elaborates on this and explains that dialectic belongs to the so called 'stochastic' arts, which 'do not proceed by definite steps, but also require an understanding appropriate to them with a view to accommodating the circumstances and ordering what is said and done in such a way that this order makes it practically effective'.<sup>49</sup> This is how he details the task of dialectic following Aristotle:

**(T7)** [Aristotle] says that our command of it will be complete when we have not omitted any of the things that can be used in a dialectical argument conducted in a plausible way over the set thesis. For it is not required of the dialectician that the interlocutor should always be led into a contradiction, just as it is not required of the orator always to persuade: his task is to omit nothing that is persuasive with a view to making the issue credible<sup>50</sup> (trans. van Ophuijsen)

In non-stochastic arts, which operate in accordance with well-defined methods, the function (ἔργον) of the art coincides with the production of the end-result (τέλος): the task of house-building is to build houses, and the task of weaving is to produce woven fabrics. Houses and fabrics are also their end-results. In the stochastic arts, the end-result depends not just on following all the prescriptions of the art, but also on the external factors which are outside the control of the practitioner of the art. Thus, the function of a physician is to do everything possible to cure the patient, but not simply to cure the patient. Curing could happen as a result of unskilled help, as a matter of luck: such case would not count as an achievement of medicine. On the other hand, valid rule-based efforts of an excellent doctor are sometimes unsuccessful because of the nature of the case.<sup>51</sup>

Alexander's elaboration on this short chapter may be helpful for understanding his view on the role of dialectic in philosophical discussions. The task of 'omitting no possibility' presupposes that the dialectician has full command of the method of dialectic on the scale as presented in the *Topics* 2-7, and knows how to exploit all these prescriptions for a winning strategy in a particular case. In the case of aporetic argument *in utramque partem* the dialectical method is applied so as to make equal provisions for both the thesis and antithesis. This amounts to a methodological requirement for a dialectician to make sure that both the opposite positions have been properly examined, with their strong and weak points. This must be the implicit reason why dialectic may somehow 'hit' on the truth, even

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<sup>48</sup> *Top.* 1.3, 101a5-10.

<sup>49</sup> Alexander *In Top.* 32, 17-20 (trans. van Ophuijsen): ἢ μᾶλλον ὅτι στοχαστικαὶ οὔσαι οὐ κατὰ ὠρισμένα τινὰ προΐασιν, ἀλλὰ δεῖ καὶ οἰκείας συνέσεως αὐταῖς πρὸς τὸ ἀρμόσασθαί τε τὰ προσπίπτοντα καὶ τάξαι τὰ γινόμενά τε καὶ λεγόμενα ὥστε ταχθέντα χρήσιμα γενέσθαι.

<sup>50</sup> *In Top.* 32, 22-26: φησὶ δὴ τότε ἡμᾶς τελείως ἔξειν αὐτήν, ὅταν τῶν ἐνδεχομένων εἰς τὸ προκειμένον ἐνδόξως ἐπαχειρηθῆναι μηδὲν παραλίπωμεν· οὐδὲ γὰρ τὸ πάντως εἰς ἀντίφασιν περιαγαγεῖν τὸν διαλεγόμενον ἔργον τοῦ διαλεκτικοῦ, ὥσπερ οὐδὲ τοῦ ῥήτορος τὸ πείσαι, ἀλλὰ καὶ τούτου τὸ μηδὲν τῶν εἰς πίστιν τοῦ προκειμένου πιθανῶν παραλιπεῖν.

<sup>51</sup> Alexander *in Top.* 32,12-34,5.

if it is not able to establish the truth in the way the scientific demonstration can. Alexander's use of dialectic in the discussion of aporiae in *Metaphysics Beta* can illustrate this approach in more detail.

### 3. Aporetic method and exegesis

In his *Metaphysics* commentary, Alexander explicitly connects the utility of aporiae with the utility of dialectic discussed in the *Topics*:

**(T8)** These remarks about the need first of all to work through the aporiae would also show the usefulness of dialectic for philosophy and for the discovery of truth. For it is characteristic of dialectic to work through aporiae and to argue on both sides [of a case]. So what was said in the *Topics* [1.2], that dialectic is useful for philosophical inquiries, is true. (trans. Madigan)<sup>52</sup>

The *Topics* account of dialectic informs Alexander's interpretation of the aporiae in the *Metaphysics Beta* as arguments largely from endoxic premisses, 'verbal' and 'dialectical'. In his closing summary characterisation of the arguments in *Beta* he says:

**(T9)** The aporiae presented in *Beta* contain arguments from accepted opinions and conducted on the level of plausibility. And indeed it is impossible for people to argue for opposed positions, except by using verbal<sup>53</sup> arguments: for nor could the aporiae be solved, if this were not the case. <sup>54</sup> (trans. Madigan, lightly modified)

The claim that the aporiae cannot be solved unless such verbal, endoxic arguments are used, merits attention. Alexander does not seem to be saying that the principles from which a solution can be demonstrated are somehow established in a dialectical argument. This would indeed involve a much stronger view of dialectic than what we have seen in the *Topics* commentary. But Alexander's claim here seems to be rather counterfactual: if, *per impossibile*, one could demonstrate both the thesis and the antithesis of an aporia, then such an 'aporia' would not have had any solution. Such an 'aporia' would amount to sustaining the view that both A and not-A are genuinely and demonstrably true, which is clearly an impossibility. So in a way the demonstrative weakness of dialectical method may prove to be a methodological asset, because it allows us to inspect and sort through a wide range of arguments.

It has been noticed that in the *Metaphysics Beta* commentary, Alexander on several occasions uses the words 'dialectical' and 'verbal' in a special meaning when referring to the parts of aporetic arguments or which do not look very strong (and sometimes have also logical faults).<sup>55</sup> This distinction between the good and bad arguments is presumed to be

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<sup>52</sup> *in Meta.* 173,27-174, 4: διὰ δὲ τῶν προειρημένων περὶ τοῦ δεῖν διαπορεῖν πρῶτον εἶη ἂν αὐτῷ δεικνύμενον ἅμα καὶ τὸ χρήσιμον τῆς διαλεκτικῆς πρὸς φιλοσοφίαν καὶ τὴν τῆς ἀληθείας εὔρεσιν· τῆς γὰρ διαλεκτικῆς τὸ διαπορεῖν καὶ ἐπιχειρεῖν εἰς ἑκάτερα. ἀληθὲς ἄρα τὸ ἐν τοῖς Τοπικοῖς εἰρημένον τὸ χρήσιμον εἶναι τὴν διαλεκτικὴν πρὸς τὰς κατὰ φιλοσοφίαν ζητήσεις.

<sup>53</sup> The English translation by Madigan has 'merely verbal' in the last sentence, but 'merely' is not in the Greek, and as we have seen, Alexander tends to use 'verbal' as a synonym of 'dialectical'.

<sup>54</sup> *in Meta.* 236, 26-29: Ταῦτα τὰ ἐν τῷ Β ἠπορημένα, ἐξ ἐνδόξων τὰς ἐπιχειρήσεις ἔχοντα καὶ κατὰ τὸ πιθανόν· καὶ γὰρ οὐδὲ οἶόν τε εἰς τὰ ἀντικείμενα ἐπιχειροῦντας μὴ λογικαῖς ἐπιχειρήσεσι χρῆσασθαι· οὐδὲ γὰρ ἂν λύεσθαι δύναιντο, εἰ μὴ εἶχεν οὕτως

<sup>55</sup> Alexander *in Meta.* 206, 12-13; 210, 20-1; 218,17, cf. Madigan 1992, 76n4.

based on a ‘proleptic’ reading of the aporiae by Alexander. Arthur Madigan observes in the preface to his translation of Alexander’s *Metaphysics* commentary:

**(T10) (1)** Where a developmental theorist might read large parts of *Metaphysics* 3 as indicating honest perplexity on the part of an Aristotle who feels the force of opposed positions and strives to accommodate truth in them, Alexander reads the book in the light of his knowledge of Aristotle’s system, and so distinguishes, at least part of the time, the arguments which are merely dialectical from the arguments which are well founded. **(2)** At no point does Alexander suggest that Aristotle himself is seriously perplexed. **(3)** Perhaps surprisingly, however, Alexander does not volunteer information about how or where in *Metaphysics* the aporiae are supposed to be solved.<sup>56</sup>

Thus it is suggested that Alexander perhaps imports the elements of Aristotle’s ‘official’ doctrine into his interpretation of the aporiae in the *Beta*. One might even suggest that he is doing this as part of his general strategy of systematic exegesis.<sup>57</sup> But if this is how the exegetical strategy works, one might raise a question about the function of the aporiae in the commentary: can they still be seen as genuine puzzles rather than the necessary elements of composition, where the reader of a commentary is expecting to see the answers instead of questions?

Let us consider as an example Alexander’s discussion of Aristotle’s argument for the existence of form and matter as constituents of a sensible substance in Aporia 8. Aristotle here operates with some elements of his hylomorphic theory which with hindsight might be developed into a full solution.<sup>58</sup>

The question discussed by Aristotle in this aporia, which he calls ‘the most difficult and the most necessary to consider’ is as follows: is there, or is there not, anything apart from sensible particulars? The solution he canvasses is that what exists apart from particulars is not the genera or species, and not the separate entities at all, but form and matter, the hylomorphic constituents of substance.<sup>59</sup> We shall look at the part of the argument which derives the existence of form and matter from the existence of coming-to-be and change. I present its structure below as a sequence of three arguments, because this is how Alexander construes it.

**(T11) (1) [Argument for the eternity of matter] (i)** [If there is nothing besides the particulars] there would not be anything eternal nor yet motionless (since all objects of sense perish and are subject to motion). **(ii)** But if nothing is eternal, *even coming to be is impossible*: for that which is coming to be must be something and so must that from which it is coming to be; **(iii)** and the last of these must be ungenerated (if **(iv)** the series comes to an end and **(v)** nothing can come to be out of non-being).

**(2) [Argument for the limit]** Furthermore, *if coming to be and motion exist*, there must also be limit. For first: no motion is unlimited; rather every motion has an end; and secondly: nothing can be in process of coming to be if it is incapable of getting into being, and that which has come to be must (at the first moment of having come to be) be.

**(3) [Argument for the eternity of form]** Furthermore, *if there exists matter* (because of its being ungenerated), it is yet more reasonable by far that there exists essence/substance: that which the matter is coming to be. For if there is neither essence/substance nor matter, there will be nothing at all; but if that is impossible, there must be something besides the concrete whole, namely the shape and the form.

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<sup>56</sup> Madigan 1992, 79.

<sup>57</sup> As explained by P.L. Donini 1994 ([2011], 226).

<sup>58</sup> In fact, the argument was used by scholars as an example of Alexander’s own interpretation of Aristotle’s theory of form, see n. 76 below.

<sup>59</sup> For recent analysis of Aristotle’s aporia, see Broadie 2009.

**(4) [A difficulty with this position]:** But, on the other hand, if one does posit this, there is a difficulty: in which cases shall one posit it, and in which not? That it is impossible to do so in all cases is obvious. For we would not suppose there to be a house besides the particular houses.<sup>60</sup> (trans. Broadie)

The argument is summarised by Alexander as follows: '[He says this] to prove that if there is not something eternal, neither will there be becoming; and if there is no becoming, neither will there be things generated; and if there are no things generated, neither will there be sensibles. From which it follows that if only sensible things exist, then even sensible things do not exist.'<sup>61</sup> Alexander points out that the 'eternity' requirement in **(T11.1.i)** is derived as a conclusion of endoxic argument. In Aristotle's system the eternity would not be ruled out by the absence of anything other than sensible substances, since the heaven is both sensible and eternal.<sup>62</sup> However, Alexander treats the subsequent steps in the argument as relatively independent from this endoxic derivation.

This is how he sets out the first problem of eternity (= **T11.1.ii**):

**(T12) (1)** That if there is not something eternal neither will there be becoming, Aristotle proves in the following way. **(2)** If something comes to be, it is necessary that there be **[i]** something that [it] is coming to be, that is, that which the thing coming to be is coming to be, and, **[ii]** different from this, that from which it is coming to be. **(3)** For example, if a man is coming to be, there must be and must be able to be, both **[i]** that which a man is coming to be (for, if man were not already in existence, a man could not come to be - so man, which it is said to come to be, must exist as something) - and in addition **[ii]** that from which this man comes to be (for everything that comes to be comes to be from what is unlike itself; for if it were it, it could not be becoming it); this is the subject, matter.<sup>63</sup>

The two constituents of the process of change whose eternity will be proved are called **[i]** 'that which [a thing coming to be] is coming to be' and **[ii]** 'subject, matter'. Alexander's example does not spell out the exact ontological status of 'that which' **[i]**: it could be form,

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<sup>60</sup> *Meta.* 3.4, 999b4-28: **(1)** ἔτι δ' οὐδ' αἰδῖον οὐθὲν οὐδ' ἀκίνητον (τὰ γὰρ αἰσθητὰ πάντα φθείρεται καὶ ἐν κινήσει ἐστίν)· ἀλλὰ μὴν εἴ γε αἰδῖον μὴθὲν ἐστίν, οὐδὲ γένεσιν εἶναι δυνατόν. ἀνάγκη γὰρ εἶναι τι τὸ γιγνόμενον καὶ ἐξ οὗ γίγνεται καὶ τούτων τὸ ἔσχατον ἀγέννητον, εἴπερ ἴσταται τε καὶ ἐκ μὴ ὄντος γενέσθαι ἀδύνατον· **(2)** ἔτι δὲ γενέσεως οὕσης καὶ κινήσεως ἀνάγκη καὶ πέρας εἶναι (οὔτε γὰρ ἄπειρος ἐστίν οὐδεμία κίνησις ἀλλὰ πάσης ἐστὶ τέλος, γίνεσθαι τε οὐχ οἷόν τε τὸ ἀδύνατον γενέσθαι· τὸ δὲ γεγονὸς ἀνάγκη εἶναι ὅτε πρῶτον γέγονεν)· **(3)** ἔτι δ' εἴπερ ἡ ὕλη ἐστὶ διὰ τὸ ἀγέννητος εἶναι, πολὺ ἔτι μᾶλλον εὐλόγον εἶναι τὴν οὐσίαν ὃ ποτε ἐκείνη γίγνεται· εἰ γὰρ μήτε τοῦτο ἔσται μήτε ἐκείνη, οὐθὲν ἔσται τὸ παράπαν, εἰ δὲ τοῦτο ἀδύνατον, ἀνάγκη τι εἶναι παρὰ τὸ σύνολον, τὴν μορφήν καὶ τὸ εἶδος. — **(4)** εἰ δ' αὖ τις τοῦτο θήσει, ἀπορία ἐπὶ τίνων τε θήσει τοῦτο καὶ ἐπὶ τίνων οὐ. ὅτι μὲν γὰρ ἐπὶ πάντων οὐχ οἷόν τε, φανερόν· οὐ γὰρ ἂν θείημεν εἶναι τινα οἰκίαν παρὰ τὰς τινὰς οἰκίας.

<sup>61</sup> *In Meta.* 212, 25-27.

<sup>62</sup> To the same effect, Broadie 2009, 142: 'Aristotle is ignoring his own heavens and stars'.

<sup>63</sup> *In Meta.* 212, 27 - 213, **(1)** ὅτι δὲ εἰ μὴ ἐστὶ τι αἰδῖον, οὐδὲ γένεσις ἔσται, οὕτως ἔδειξεν. **(2)** εἰ γίγνεται τι, ἀνάγκη εἶναι τι τὸ τε γιγνόμενον, τουτέστιν ὃ γίγνεται τὸ γιγνόμενον, καὶ ἄλλο τούτου τὸ ἐξ οὗ γίγνεται· **(3)** οἷον εἰ ἄνθρωπος γίγνεται, δεῖ εἶναι καὶ δύνασθαι εἶναι καὶ τοῦτο ὃ γίγνεται ἄνθρωπος (ἀνυπάρκτου γὰρ ὄντος τοῦ ἀνθρώπου οὐδ' ἂν γένοιτο ἄνθρωπος, δεῖ οὖν εἶναι τι τὸν ἄνθρωπον ὃ λέγεται γίνεσθαι), καὶ ἔτι τὸ ἐξ οὗ γίγνεται οὗτος· πᾶν γὰρ τὸ γιγνόμενον ἐξ οὗ τοιούτου· εἰ γὰρ ἦν τοῦτο, οὐκ ἂν ἐγένετο· τοῦτο δὲ ἐστὶ τὸ ὑποκείμενον καὶ ὕλη.

but it could also be an instance of a kind. Alexander's example of man in **[T12.3.i]** suggests that the coming to be requires the presence of an instance of a kind 'man'.<sup>64</sup>

Strikingly, Alexander understands matter as prime matter rather than the last proximate matter.<sup>65</sup> He is surely familiar with the account of hylomorphic compound in *Meta. Z* 8-9, where the ungenerated matter of the bronze sphere is bronze rather than the liquid or the prime matter.<sup>66</sup> Alexander would have no difficulty supplying a suitable example for a living substance.<sup>67</sup> But this more nuanced view is consciously omitted. His reason, I think, is that in a dialectical argument he envisions, any proximate matter can be considered as a sensible compound which itself has been generated. To avoid a regress, it is necessary to make a case for matter isolated from form.

The eternity of matter is established by two arguments as indicated by Aristotle in **[T11.1.iii]**: the reduction to the infinite regress and the reduction to the generation *ex nihilo*.<sup>68</sup> The latter argument is explicitly said to be accepted as a 'common opinion' of the students of nature.<sup>69</sup> Alexander fails to see the case for form in Aristotle's second argument **[T11.2]**<sup>70</sup> and takes 'limit' to refer to the temporal point of completion of the process of coming to be. He develops a tortuous interpretation supplying an additional premiss 'forgotten' by Aristotle, namely that everything that has the end-point (= limit) must have a starting point (ἀρχή), thus turning this argument into a third proof of the ultimate prime matter.<sup>71</sup>

Alexander introduces Aristotle's proof of the eternity of form **[T11.3]** as following upon the proof of the eternal ungenerated prime matter:

**(T13) (1)** Having proven, then, that the primary subject must be ungenerated, and that coming to be does not go on to infinity, Aristotle now proves that the form, which comes to be in the matter,

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<sup>64</sup> The same ambiguity is present in Alexander's alternative summary of the whole argument at 213, 19-23: δοκεῖ γὰρ ἐν τοῖς κατὰ φύσιν γιγνομένοις τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου γίνεσθαι· ἄνθρωπος γὰρ ἄνθρωπον γεννᾷ, ὥστε εἰ γίγνεται ἄνθρωπός τις, δεῖ ἄνθρωπον εἶναι· τὸν γὰρ ποιοῦντα καὶ γεννῶντα. ἀναγκαῖον δὲ καὶ ἐπὶ τούτων εἶναι ποιητικὸν αἰδίων, καὶ αὐτὸς μετὰ τὸ περὶ τῆς ὕλης εἰπεῖν ἐπιχειρεῖ δεικνύναι ὅτι καὶ τὸ γινόμενον αἰδίων εἶναι δεῖ.

<sup>65</sup> This is at odds with some modern interpretations of the arguments: cf. Ross 1924, vol.1, 240, Broadie 2009, 142-3.

<sup>66</sup> *Meta. Z* 8, 1033a31-b10; *Z* 9, 1034b7-19.

<sup>67</sup> Cf. his argument against the critics of Aristotle's definition of the soul that 'the body that has life potentially' refers to the embryo. Alexander *Quaest.* 2.27.

<sup>68</sup> *In Meta.* 213, 3-10. ἔσχατον δὲ ὑποκείμενόν ἐστιν ἡ πρώτη ὕλη· ἀναλύοντες γὰρ τὰς προσεχεῖς ὕλας τῶν γιγνομένων ἐν ἐκείνῃ ἐσχάτῃ παύομεθα. ἢ ἐσχάτην ὅτι ἀναγκαῖον ἐστὶν αἰδίων εἶναι, δεικνυσὶν ἐκ τοῦ εἰ μὴ ἐστὶ τι ἔσχατον ὑποκείμενον αἰδίων, ἐξ οὗ ἡ γένεσις, ἀκολουθήσει ἢ ἐπ' ἀπειρον γίνεσθαι ἄλλο ἐξ ἄλλου ἢ ἐκ τοῦ μὴ ὄντος γίνεσθαι· ἀμφοτέρω δὲ ἀδύνατα. εἰ γὰρ πᾶν τὸ ληφθὲν ὑποκείμενον γέγονε, δεήσει αὐτὸ ἢ ἐξ ἄλλου ὑποκειμένου γεγονέναι ἢ ἐκ τοῦ μὴ ὄντος, εἰ γέγονε μὲν, οὐκ ἐξ ὑποκειμένου δέ. ἀλλὰ μὴν ἀμφοτέρω ἀδύνατον.

<sup>69</sup> *In Meta.* 213, 11-13. κοινὴ γὰρ αὕτη δόξα τῶν περὶ φύσεως εἰπόντων τι, τὸ μηδὲν ἐκ τοῦ μὴ ὄντος γίνεσθαι, καὶ φανερώς ἄτοπον καὶ ἀδύνατον τὸ οὕτω τι λέγειν γίνεσθαι.

<sup>70</sup> Differently from Ross 1924, vol.1, ad 999b12, but cf. Broadie 2009, 144-5. However, Alexander uses the language of process and completion used by Aristotle in **(T11.2)** in his discussion of the next argument concerning form **(T11.3)**, so maybe he is still aware of the force of this argument for the argument for form. But he definitely does not want to identify form with the limit of the process of coming to be, probably because this would endanger its relative independence from this process and foundational priority to it in this dialectical argument.

<sup>71</sup> *In Meta.* 213, 26 - 214, 17

must be eternal as well, **(2)** thereby proving and establishing that there will be some unitary eternal substance.<sup>72</sup> **(3)** For if there is a nature of matter, then it is all the more reasonable for there to be this essence, which the matter receives; this is what he indicated by saying ‘whatever the matter comes to be’ [999b14]. **(4)** By ‘essence’ he means ‘form’. For that according to which each thing has being is essence. **(5)** For matter, having received form, presents that which is coming to be from it as that which has come to be, that is as that which it receives and that which it becomes. **(6)** That it is reasonable, then, for the form too which the matter receives to pre-exist, being eternal, Aristotle proves as follows. **(7)** Just as it was impossible for anything to come to be if the subject did not exist, so too it would be impossible for there to be becoming, if that which the subject receives did not exist. **(8)** Aristotle says this in the words: ‘for if neither the latter nor the former is to be, nothing will be there at all [999b14-15] *which is equivalent to ‘for if both did not exist, the matter and the form, both eternal, nothing at all could come to be’.* **(9)** Aristotle makes it clear that this is his meaning saying: ‘It is necessary that there exist something distinct from the composite: the shape, the form’ [999b16], meaning by the composite that which has come to be, which is conjoint and sensible . . . **(11)** He rightly assumes that, as matter [exists as eternal], there must also exist some eternal form - not that the form which comes to be in the matter must be this; it is rather the productive [form] which, if it is like the form that is produced, would be in some manner pre-existent.<sup>73</sup> (trans. Madigan, lightly modified)

In **(T13.3)**, Alexander says that the existence of form follows *a fortiori* since the being of matter has been established independently, and since it has been assumed that there is the coming to be. The small, but important addition Alexander makes here **(T13.4)** is that essence is that which each thing is. In the *Topics* commentary, Alexander gives as an example of the indemonstrable principle: ‘Of each of the things that are, the form is that according to which it is’.<sup>74</sup> But in our argument **(T13.3-5)** it is not used as a premiss of demonstration. This argument shows that the form must *reasonably* exist given *the coming to be and the matter*.

The eternity of form is proved at the next step **(T13.6-11)**. Again Alexander signals that this conclusion is established as *reasonable* **(T13.6)**. It is reasonable again given what has been established about matter **(T13.7)**, and this time Alexander derives the eternity of form from the eternity of matter, reinterpreting to this effect in **(T13.8)** Aristotle’s rather weaker and more ambiguous wording to say precisely that the coming to be would not be possible unless *both* matter and form *were eternal*. We can see that at this point Alexander

<sup>72</sup> I am inclined to mark this whole section **(T13.2)** as a possible gloss: although it does not necessarily conflict with the rest of Alexander’s argument, the adjective μοναδικός is a hapax in the extant corpus of Alexander, but frequently occurs in Michael of Ephesus’ commentary on *Metaphysics* E-N.

<sup>73</sup> 214, 24 - 215, 18. **(1)** δείξας οὖν ὅτι τὸ πρῶτον ὑποκείμενον δεῖ ἀγένητον εἶναι καὶ οὐκ ἐπ’ ἄπειρον γίνεσθαι ἄλλο ἐξ ἄλλου, νῦν δείκνυσιν ὅτι καὶ τὸ εἶδος, ὃ γίγνεται ἐν τῇ ὕλῃ, εἶναι δεῖ αἰδίον, **(2)** δεικνύς διὰ τούτων καὶ κατασκευάζων ὅτι ἔσται τις οὐσία μοναδικὴ αἰδίος. **(3)** εἰ γὰρ ἔστι φύσις τῆς ὕλης, εὐλογώτερον τὴν οὐσίαν εἶναι ταύτην, ἣν ἡ ὕλη δέχεται· τοῦτο γὰρ ἐδήλωσε διὰ τοῦ εἰπεῖν ὅ ποτε ἐκείνη γίγνεται. **(4)** οὐσίαν δὲ τὸ εἶδος λέγει· καθ’ ὃ γὰρ ἐκάστῳ τὸ εἶναι, τοῦτο οὐσία· **(5)** ἡ γὰρ ὕλη δεξαμένη εἶδος παρέχεται τὸ γινόμενον ἐξ αὐτῆς γεγονός, τουτέστιν ὃ δέχεται τε καὶ γίνεται. **(6)** ὅτι οὖν εὐλογον καὶ τὸ εἶδος προϋπάρχειν αἰδίον ὄν, ὃ ἡ ὕλη δέχεται, οὕτω δείκνυσιν. **(7)** ὥσπερ μὴ ὄντος τοῦ ὑποκειμένου ἀδύνατον ἦν γενέσθαι τι, οὕτω καὶ μὴ ὄντος τοῦ ὃ δέχεται τὸ ὑποκείμενον ἀδύνατον γένεσιν εἶναι· **(8)** ὃ εἶπε διὰ τοῦ εἰ γὰρ μήτε τοῦτο ἔσται μήτε ἐκείνο, οὐδὲν ἔσται τὸ παράπαν, ὃ ἴσον ἐστὶ τῷ εἰ γὰρ μὴ ἀμφοτέρω εἶη ἢ τε ὕλη καὶ τὸ εἶδος αἰδία, οὐδὲν ἂν τὸ παράπαν γένοιτο. **(9)** ὅτι γὰρ τοῦτο λέγει, ἐδήλωσεν εἰπὼν ἀνάγκη τι εἶναι παρὰ τὸ σύνολον τὴν μορφήν καὶ τὸ εἶδος, τὸ μὲν σύνολον λέγων τὸ γεγονός, τὸ συναμφοτέρον καὶ αἰσθητόν. **(10)** δεῖν δὲ ἐκάτερον εἶναι λέγων, ἐξ ὧν εἶναι τὸ σύνολον, τὴν τε ὕλην καὶ τὴν μορφήν καὶ τὸ εἶδος, ὡς εἶπομεν (λέγει γὰρ, εἰ μήτε τοῦτο ἔσται μήτε ἐκείνη, λέγων τὸ εἶδος καὶ τὴν ὕλην, οὐθὲν ἔσται τὸ παράπαν), ἐπήνεγκεν εἰ δὲ τοῦτο ἀδύνατον, λέγων ἀδύνατον τὸ μηδὲν ἔσεσθαι, ἀνάγκη εἶναι παρὰ τὸ σύνολον, τουτέστι τὸ συναμφοτέρον, ὃ ἐστὶν εἶδος ἐν ὕλῃ, τὴν μορφήν καὶ τὸ εἶδος, **(11)** ὑγιὲς μὲν λαμβάνων τὸ δεῖν, ὡς ἡ ὕλη, οὕτως εἶναι τι καὶ εἶδος αἰδίον, οὐ μὴν τὸ ἐν τῇ ὕλῃ γινόμενον εἶναι δεῖ τοῦτο, ἀλλὰ τὸ ποιητικόν, ὃ εἰ εἶη τῷ ποιουμένῳ ὅμοιον, εἶη ἂν προϋπάρχον πως.

<sup>74</sup> *In Top.* 1.1, 17, 3.

interprets Aristotle's phrase 'if neither the latter nor the former...' as meaning 'if not both the latter and the former...' - violating de Morgan's law and making a conjunction of negations into a negation of conjunction (**T13.8**). But this minor logical *tour de force* is in Aristotle's interest: otherwise just one hylomorphic component (for instance, matter) would have been sufficient for the coming to be of a compound. Alexander dwells on this point unusually long, perhaps to make sure that the correct meaning comes across despite what is suggested by Aristotle's text.

Alexander's final clarification in (**T13.11**) to the effect that it is not the future enmattered form that possesses eternity, but the *productive form* which already pre-exists, seems tantalisingly incomplete. How is the eternity of the pre-existing productive form established? Are we to think of some version of infinite regress of forms which will require to stop at the first pre-existent form?

More importantly, there is a question of the force of this claim in Alexander's interpretation of Aristotle. It could be taken simply as another way of saying that every sublunary living being partakes of eternity through the species, in line with Alexander's earlier formulations in this text, and in line with Aristotle's principle *ἄνθρωπος ἄνθρωπον γεννᾷ*. Alternatively, the expression 'productive form' might suggest a stronger version of the theory of form sketched out by Alexander as a part of his own substantialist interpretation of Aristotle's theory of form.<sup>75</sup> Marwan Rashed has plausibly suggested that the passage should be read in this latter sense and understood as Alexander's response to the earlier nominalist, non-substantialist interpretation proposed by Boethus of Sidon.<sup>76</sup>

At the same time, Alexander is clearly far from dismissing the antithesis of the position backed by the hylomorphic account in our argument, i.e. the view that nothing exists apart from sensible substances. This view serves as a platform from which to raise further constructive puzzles about the draft hylomorphic interpretation. These include the difficulty (**T11.4**) which asks about a distinction between the cases where there is an eternal form and those cases where there patently is not any, as in the case of artefacts. Notably, Alexander points out that this difficulty is valid both with regard to the hylomorphic version of the thesis developed so far and against the 'Ideas' version (which has not been discussed in this case perhaps to avoid the repetition of arguments that were used against it earlier, in *aporiae* five and seven). He also elaborates on Aristotle's next puzzle which asks whether the eternal form (as established in our argument **T11.3**) is numerically one or multiplied according to the number of sensible substances (999b20-23). Both *prima facie* answer options seem implausible. A good answer will require a more precise account of form's presence in matter, which is the subject of the final puzzle, and an account of the way form and matter are combined in the composite substance (999b23-24). Alexander points out that Aristotle deals with this problem elsewhere, 'inquiring what it is that unifies and holds together the form in matter; there he says that it is the potential character of matter which becomes the cause of [matter's] grasping the form and [of the form's] remaining in matter while matter is changing into that which, up to this point, it has been potentially; and clearly this takes place with some pre-existing productive cause'.<sup>77</sup>

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<sup>75</sup> Amply attested in Alexander's school treatises: *Mantissa* 5, *Quaest.* 1.3, 1.8, 1.11, 1.17, 1.26, Ellis 1994, Sharples 2004; Sharples 2005; Rashed 2007; Chiaradonna 2013.

<sup>76</sup> Rashed 2007, 240-241.

<sup>77</sup> Alexander, *in Meta.* 216, 8-11. There is no clarity on whether Alexander has in mind one particular text, or whether he is referring to some parts of Aristotle's work more generally. In the *Metaphysics*, the definition of matter as that which not being a *τόδε τι* in actuality is a *τόδε τι* potentially is found in H 1 (1042a17-18). In H2, we have a discussion of the types of combination of matter which account for a variety of kinds of substance. Madigan ad loc. refers to *GC* 1.3 and 1.4.

Thus, although Alexander's commentary does not indeed provide a developmental account of Aristotle's views on *aporiae* and their solutions, it still is not 'weighted' towards the hylomorphic account anticipated by one side of the argument. Rather, it conveys the expectation that the solution of the *aporia* will be arrived at as a result of many calibrating discussions, removing the implausibilities inevitable in a dialectical discourse and channelling the insights of the fresh starts in such a way as to help resolve these dialectical problems. We cannot consider the hylomorphic theory as a stable, not to mention well-founded, position, until the difficulties raised by the opposite side are answered. In this sense Alexander's commentary reflects a genuine perplexity, understood not as a merely psychological state overcome by the middle books of *Metaphysics*, but as an objective difficulty without working through which the middle books of *Metaphysics* will be of no avail. This presentation of Aristotle's argument as a whole may indeed reflect Alexander's own exegetical concerns boosted by the earlier (and possibly ongoing) debates in the Peripatetic school. In that case, Aristotle's *aporia* is taken by Alexander as a framework for the living exegetical debate.

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