

# Alexander of Aphrodisias on Analysis to the First Principle

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## Abstract

In this paper I explore Alexander's interpretation of Aristotle's arguments for the First Unmoved Mover, as it can be reconstructed from various sources. Alexander sets out to provide a clear answer to many of the puzzles that have haunted this topic until today. I argue that Alexander regards the argument summarized in *Quaest.* I.1 as an instance of dialectic serving philosophical goals, as he describes it in his *Topics* commentary. More particularly, I identify the argument in the second part of *Quaest.* I.1 as a case of analysis in the sense of reduction to (matter and) form, which is one of the meanings of 'analysis' that Alexander lists in his commentary on the *Prior Analytics*.

Recent years have witnessed an increasing interest in Alexander of Aphrodisias' commentary on the *Metaphysics*, and not least his comments on the famous book *Lambda* that will interest us here.<sup>1</sup> Of the Greek commentary transmitted under Alexander's name only the first part covering books 1-5 of the *Metaphysics* is genuine. Modern scholarship has attributed the commentary on books 6-14 to Michael of Ephesus on good grounds.<sup>2</sup> But the dossier regarding *Metaphysics* Lambda is more complex. Averroes, in his Long Commentary on the *Metaphysics*, shows a great debt to Alexander's commentary, and has preserved for us a number of fragments of Alexander's exegesis of book *Lambda*.<sup>3</sup> In Arabic

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<sup>1</sup> See e.g. A. Balansard – A. Jaulin (eds.), *Alexandre d'Aphrodise et la métaphysique aristotélicienne*, Peeters, Leuven 2017; I.M. Bodnár, "Alexander of Aphrodisias on Celestial Motions", *Phronesis* 42 (1997), pp. 190-205 and Id., "Alexander's Unmoved Mover", in C. Cerami (ed.), *Nature et sagesse. Les rapports entre physique et métaphysique dans la tradition aristotélicienne. Recueil de textes en hommage à Pierre Pellegrin*, Peeters, Leuven 2014; S. Fazzo, "L'exégèse du livre *Lambda* de la *Métaphysique* d'Aristote dans le *De Principiis* et dans la *Quaestio* I.1 d'Alexandre d'Aphrodise", *Laval théologique et philosophique* 6.3 (2008), pp. 607-26, Ead., "The *Metaphysics* from Aristotle to Alexander of Aphrodisias", *Bulletin of the Institute of Classical Studies* 55.1 (2012), pp. 51-68; S. Fazzo – M. Zonta, "Towards a Textual History and Reconstruction of Alexander of Aphrodisias's *Treatise on the Principles of the Universe*", *Journal of Semitical Studies* 59.1 (2014), pp. 91-116; P. Golitsis, *Alexander of Aphrodisias. Commentary on Aristotle, Metaphysics (Books I-III): Critical Edition with Introduction and Notes*, De Gruyter, Berlin-Boston 2022 (CAGB 3.1); G. Guyomarc'h, *L'unité de la métaphysique selon Alexandre d'Aphrodise*, Vrin, Paris 2015 (Textes et traditions); M.E. Kotwick, *Alexander of Aphrodisias and the Text of Aristotle's Metaphysics*, University of California, Berkeley 2016; L. Lavaud – G. Guyomarc'h, *Alexandre d'Aphrodise. Commentaires à la Métaphysique d'Aristote. Livres Petit Alpha et Beta*, Vrin, Paris 2021 (Bibliothèque des Textes Philosophiques); C. Luna, *Trois études sur la tradition des commentaires anciens à la Métaphysique d'Aristote*, Brill, Leiden 2001 (*Philosophia Antiqua*, 88), F.D. Miller Jr. (trans. by), 'Alexander' *On Aristotle Metaphysics 12*, Bloomsbury Academic, London-New York 2021 (Ancient Commentators on Aristotle).

<sup>2</sup> Luna, *Trois études* (above, n. 1), Miller Jr., 'Alexander' *On Aristotle Metaphysics 12* (above, n. 1).

<sup>3</sup> J. Freudenthal, *Die durch Averroes erhaltenen Fragmente Alexanders zur Metaphysik des Aristoteles*, Abhandlungen der Königlich Preussischen Akademie der Wissenschaften, Berlin 1885, collected the fragments of Alexander's commentary on *Metaph.* XII in Averroes Long Commentary on the *Metaphysics*. Cf. Kotwick, *Alexander of Aphrodisias* (above, n. 1), pp. 29-32, 75-8, 200-6. M. Di Giovanni - O. Primavesi, "Who Wrote

we further have different versions of Alexander's *On the Principles of the Universe*,<sup>4</sup> which contains an exegesis of *Metaph.* 12.6-8 in connection with arguments from *Physics* 8.<sup>5</sup> In Greek we have a so-called *quaestio* attributed to Alexander on the topic of "the arguments one might use to establish the first cause according to Aristotle" (*Quaest.* I.1), which can be regarded as a shorter version of the argument found in the second part of *On the Principles* (p. 64.2ff Genequand).<sup>6</sup> We also possess a different outline of *On the Principles* in Arabic, which has much in common with *Quaest.* I.1.<sup>7</sup> Most of the argument of *Quaestio* I.1, in its turn, has been incorporated almost verbatim in Michael's commentary on *Metaph.* XII 6 (pp. 685.30-687.22 Hayduck [CAG I]).

Concetta Luna has contributed much to the elucidation of the commentary tradition on the *Metaphysics*. In particular, she has shown, to my mind conclusively, that Michael of Ephesus should be regarded as the author of the commentary on *Metaphysics* Books 6-14. Moreover, she has defended Michael against the charge of being a forger, who tried to pass his commentary as Alexander's own. The Byzantine commentator might make this impression e.g. because he inserts the quote from *Quaestio* I.1, along with three quotes from Alexander's *De Anima*, into his commentary without identifying them as such.<sup>8</sup> Building on the work of Donini, Luna has shown that all of Michael's commentaries exhibit such conscious patchwork of borrowings from various sources, because he had to produce commentaries under severe time constraints—as he himself confesses.<sup>9</sup> In the recent English translation of Michael *In Metaph.* 12, Miller has argued that despite this method, the commentator has still managed to produce a coherent and often insightful treatment of Aristotle's demanding treatise.<sup>10</sup>

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Alexander's Commentary on *Metaphysics* Λ? New Light on the Syro-Arabic Tradition", in Ch. Horn (ed.), *Aristotle's Metaphysics Lambda – New Essays*. Proceedings of the 13<sup>th</sup> Conference of the Karl and Gertrud-Abel Foundation Bonn, November, 28<sup>th</sup>–December 1<sup>st</sup>, 2010, De Gruyter, Berlin 2016 (*Philosophie der Antike* 33), pp. 11-66, have shed doubt on the Alexandrian provenance of the fragments which they ascribe to an unknown Greek reviser of an original work by Alexander.

<sup>4</sup> Ed. by Ch. Genequand, *Alexander of Aphrodisias on the Cosmos. Arabic text with English Translation, Introduction and Commentary*, Brill, Leiden [etc.] 2001 (*Islamic Philosophy, Theology and Science. Texts and Studies*, 44).

<sup>5</sup> M. Rashed, *Alexandre d'Aphrodise, Commentaire perdu à la Physique d'Aristote (Livres IV–VIII)*, De Gruyter, Berlin 2011; further information can be gleaned from Simpl., *In Phys.* 8, and *In De Cael.* discussed by Bodnar, "Alexander of Aphrodisias on Celestial Motions" (above, n. 1), Id. "Alexander's Unmoved Mover" (above, n. 1).

<sup>6</sup> Alex. Aphrod., *Quaest.* I.1 in R.W. Sharples (trans. by), *Alexander of Aphrodisias Quaestiones 1.1-2.15*, Duckworth, London 1992 (*Ancient Commentators on Aristotle*). See further Fazzo "L'exégèse du livre *Lambda*" (above, n. 1), also on the existence of shorter and longer versions of works of Alexander, probably designed for different audiences (*De Fato* and *De Anima* have their shorter cousins in *Mant.*, and in some of the *Quaestiones*), and on the observation that all of Alexander's arguments are steeped in Aristotelian exegesis.

<sup>7</sup> It is entitled *Epistle of Alexander Aphrodisiensis on the First Cause, and the causatum and its movements and their differences, and the movement of what is in corruption and generation*. See G. Endress, "Alexander Arabus on the First Cause. Aristotle's First Mover in an Arabic Treatise Attributed to Alexander of Aphrodisias", in C. D'Ancona – G. Serra (eds.), *Aristotele e Alessandro di Afrodisia nella tradizione araba*, Il Poligrafo, Padova 2002, pp. 19-74, p. 47 with analysis (pp. 49-55) and edition of the text (pp. 65-74), prefaced by a useful introduction to the interpretative problems involved. This text does not comment on the method of analysis.

<sup>8</sup> Luna, *Trois études* (above, n. 1), pp. 66-71, also listing Michael's references to other commentaries by Alexander in the first person.

<sup>9</sup> Michael himself testifies to this method in his *In Ethic. Nic.*, p. 50.5-9 Hayduck, quoted by Luna, *Trois études* (above, n. 1), p. 71.

<sup>10</sup> Miller Jr., 'Alexander' *On Aristotle Metaphysics* 12 (above, n. 1), pp. 8-25, esp. 25: "In conclusion, it should be clear from this selective overview that, far from offering a mere paraphrase and pastiche of purloined passages,

### Quaestio I.1: the argument

In this paper I wish to have a closer look at an aspect of *Quaestio* I.1 and its parallels that has not received much attention in the profuse literature on the arguments concerning the first principle: the identification of the reasoning as ‘analysis’. In the middle of the argument of *Quaestio* I.1 Alexander states:

**T1:** The divine body will be moved by it [sc. the First Mover] through thinking of it and having desire and appetite for becoming similar to it (*homoioōsis*). For everything that is moved by some unmoved and separate thing is moved in this way. This is shown by analysis; for it is not possible for there to be any demonstration of the first principle, but one must begin from the things that are posterior and evident and, making use of analysis, establish the nature of that [first principle] through agreement with these.<sup>11</sup>

This is, in a nutshell, Alexander’s solution to an entire set of interpretative problems that confronted the ancient (and modern) reader of Aristotle’s treatises.

Let us briefly list the main issues involved so as to get a better appreciation of Alexander’s solution. In *Phys.* II 7, 198 a 21 – b 9, Aristotle mentioned the first unmoved principle of motion as a final cause, but passed it over as it is not part of natural science. In *Phys.* VIII, the more sustained argument leading up to the unmoved mover, the first principle is never called a final cause. In *Phys.* VIII 5 Aristotle argues for the unmoved mover indirectly through the notion of a self-mover (256 a 21 – 258 b 9), but he no longer adopts this line of argument in *De Caelo* and *Metaph.* XII 6-7, probably because of its Platonic overtones. In virtue of the eternity of motion, the first cause of motion must itself be eternal (*Phys.* VIII 6), and immaterial because it must have an unlimited force which no magnitude can contain because there is no such thing as an infinite magnitude (*Phys.* VIII 10 using *Phys.* III 5 for which see below **T3**). Its location, within or outside the universe, remains unclear. The unmoved mover is unmoved even coincidentally – although to be moved coincidentally by something else<sup>12</sup> remains possible ‘for some principles in the heavens’ (*Phys.* VIII 6, 260 a 22-31). In *Metaph.* XII 6 Aristotle first argues for the existence of an eternal physical substance, the first heaven. Using the results from the *Physics* he infers the existence of an eternally moved substance from the eternity of motion. From this, again, he infers the existence of an unmoved first mover, whose essence is actuality. In *Metaph.* XII 7 Aristotle reiterates that it cannot have magnitude because it has unlimited force, but now clarifies that the first mover, an act of thinking thinking itself, moves as an object of desire and of thought, being the real good. This implies that at least the outer sphere moved by the first mover must be ensouled so as to be capable of such desire and thought. Aristotle does not clearly explain whether the other

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Ps.-Alexander constructs a comprehensive interpretation of Book 12 understanding it to contain an integrated and coherent argument”.

<sup>11</sup> Alex. Aphrod., *Quaest.* I.1, p. 4.1-7: κινήθησεται δ’ ὑπ’ αὐτοῦ τὸ θεῖον σῶμα τῷ νοεῖν τὸ αὐτὸ καὶ ἔφεισιν καὶ ὀρεξίν ἔχειν τῆς ὁμοιώσεως αὐτοῦ. πᾶν γὰρ τὸ κινούμενον ὑπ’ ἀκινήτου τινός κεχωρισμένου τοῦτον κινεῖται τὸν τρόπον. ἢ δεῖξιν κατὰ ἀνάλυσιν. οὐ γὰρ οἶόν τε τῆς πρώτης ἀρχῆς ἀπόδειξιν εἶναι, ἀλλὰ δεῖ ἀπὸ τῶν ὑστέρων τε καὶ φανερῶν ἀρξάμενους κατὰ τὴν πρὸς ταῦτα συμφωνίαν ἀναλύσει χρωμένους συστήσαι τὴν ἐκείνου φύσιν. Tr. Sharples [above, n. 6], p. 18.

<sup>12</sup> I.e. as opposed to being moved coincidentally by itself, as souls are when they move along with the bodies whose movement they initiate.

spheres are moved by each other, or by desiring the same first principle—*De Caelo* II 12 explores whether they have different and multiple motions because of their distance from the first principle to which they strive as final cause (*De Caelo* II 12, esp. 292 b 4-5). But while in *De Caelo* II 2 and II 12 the heavens are called ensouled, this is contradicted in *De Caelo* II 1, 284 a 28-35, and it does not sit well with the doctrine that the natural self-motion of ether is otherwise sufficient to explain their circular motion. *De Caelo* II 12 ends on the suggestion of an awkward cohabitation of the two principles nature and soul in a limited body.

T1, and *Quaestio* I.1 as a whole, formulates a clear choice in these matters: the first principle, pure form and actuality, acts as a final cause only, and does so by being the object of thought and desire for the ensouled divine body which strives to become like the first principle. In the framework of Alexander's hylomorphism it is clear that the nature of the celestial bodies must coincide with their soul.<sup>13</sup> Since they are the most excellent corporeal entities, they have souls to match: their soul is purely rational; their only desire is the eternal rational wish (*boulēsis*) for the first principle. There is no mention of the role of ether.<sup>14</sup>

The condensed argument of the first half of *Quaestio* I.1 closely follows the lead of Aristotle *Metaph.* XII 6, 1071 b 3-22 (leaving out the problem Aristotle discusses in the remainder of the chapter), and *Metaph.* XII 7, 1072 a 19-27.<sup>15</sup> *Quaest.* I.1, p. 2.22-29 establishes the eternity of motion based on Aristotle *Phys.* VIII 1, 251 a 17-28.

In two places the argument is different from its model: *Quaest.* I.1, p. 3.9-18 offers an argument that the divine body is the best of bodies, which therefore has to be animate rather than inanimate. This excursus provides Alexander with a key element of his interpretation. *Quaest.* I.1, p. 3.23-24 shows by a regressus ad infinitum that the first mover has to be unmoved (or it would require a mover itself), instead of using Aristotle's argument about the requirement in all cases of movement of there being a mover, a moved and something in between (1072 a 23-26).<sup>16</sup>

After T1 the argument continues, but without adhering so strictly to Aristotle's text. Alexander announces that he will show that the first principle is the first object of thought and desire, and that it is most of all form that qualifies for this role. He thus confirms Aristotle's

<sup>13</sup> For Alexander's hylomorphism see F.A.J. de Haas, "Alexander of Aphrodisias on the Ancient Debate on Hylomorphism and the Development of Intellect", in D. Charles (ed.), *The History of Hylomorphism. From Aristotle to Descartes*, Oxford U.P., Oxford 2023, pp. 174-96; V. Caston, "Alexander of Aphrodisias' Emergentism: Hylomorphism Perfected", in D. Charles (ed.), *The History of Hylomorphism. From Aristotle to Descartes*, Oxford U.P., Oxford 2023, pp. 154-73.

<sup>14</sup> Cf. e.g. H.A. Wolfson, "The Plurality of Immovable Movers in Aristotle, Averroes, and St. Thomas", *Harvard Studies in Classical Philology* 63 (1958), pp. 233-53 (repr. in I. Twersky – G.H. Williams [eds.], *Harry Austryn Wolfson. Studies in the History of Philosophy and Religion*, Harvard U.P., Cambridge Mass. 1973, Vol. 1, pp. 1-21); Id., "The Problem of the Souls of the Spheres, from the Byzantine Commentaries on Aristotle through the Arabs and St. Thomas to Kepler", *Dumbarton Oaks Papers* 16 (1962), pp. 67-93 (repr. in Twersky – Williams [eds.], *Harry Austryn Wolfson. Studies in the History of Philosophy and Religion*, vol. 1, pp. 22-59); Endress, "Alexander Arabus on the First Cause" (above, n. 7). See Bodnar, "Alexander of Aphrodisias on Celestial Motions" (above, n. 1), and Id. "Alexander's Unmoved Mover" (above, n. 1) for a penetrating discussion of Alexander's view of the problems of the number and nature of the planetary motions, their spheres, and their ranking in a fixed order, as well as the tension among various discussions of these issues in Alexander's texts.

<sup>15</sup> See Fazzo, "The *Metaphysics* from Aristotle to Alexander of Aphrodisias" (above, n. 1), pp. 618-24 for a detailed breakdown of the parallels.

<sup>16</sup> Michael in *Metaph.* 693,12-30 does elaborate on this argument as his second example of analysis, see below.

argument that the primary objects of thought and desire coincide because in this case they are both noble (*kalon*) hence desirable, and best (*ariston*) because they are first (*Metaph.* XII 7, 1072 a 27 – b1). But Alexander shifts the emphasis and puts the notion of form, which is lacking from *Metaph.* XII 7, centre stage: first (p. 4.9-17 Hayduck) he emphasizes that form, which is actuality, is most intelligible in the strict sense.<sup>17</sup> Among forms, forms in the category of substance are prior, and among them the form that is most simple and always in actuality. Next (p. 4.17-24) he argues that form is also most desirable because it is noble by itself. Nobility in form ranks higher than nobility in matter, and nobility in substantial form ranks higher than nobility in other forms, all of which exist because of it. Here categorial distinctions<sup>18</sup> are introduced to support the priority of the first principle as pure form, and the first intelligible and desirable being. The new emphasis in effect replaces the actuality of the first mover with the actuality of the first *being* which is the foundation of its role as mover—quite in line with Aristotle’s intentions, if not his wording. Thus, Alexander can conclude his *quaestio* (p. 4.25-26) almost triumphantly: ‘it has been shown (*dedeiktai*) that the nature that has been previously mentioned is like this, this [being] in the strict sense and primarily both object of desire and thought’ (my translation).<sup>19</sup>

### *Analysis?*

In T1 Alexander states that analysis is the appropriate method to approach the first principle, because first principles cannot be deduced from higher principles. He is slightly more elaborate in *On the Principles* 2 (p. 44.8-12 Genequand): demonstration proceeds from what is prior, and from causes, but nothing is prior to first principles, nor do they have causes. The highest metaphysical principle, by definition, can only be approached from what is posterior. But in what sense is the argument of *Quaestio* I.1 analysis?

Alexander distinguishes various meanings of the term ‘analysis’, which reflect the long and varied history which analysis, and its complement synthesis, had in mathematical and philosophical texts before Alexander.<sup>20</sup> He provides a survey of types of analysis when explaining the title of Aristotle’s *Analytics* in his Commentary on the *Prior Analytics*:

<sup>17</sup> Not matter, which, Alexander reminds us, Plat., *Tim.* 52 B described as knowable only by bastard reasoning.

<sup>18</sup> For the importance of debates from the *Categories* tradition for Alexander’s hylomorphism see De Haas, “Alexander of Aphrodisias on the Ancient Debate on Hylomorphism” (above, n. 13).

<sup>19</sup> Alex. Aphrod., *Quaest.*, p. 4.25-26 *τοιαύτη δὲ οὕσα δέδεικται ἢ προειρημένη φύσις, κυρίως καὶ πρώτως αὕτη ὀρεκτὴ τε καὶ νοητὴ.*

<sup>20</sup> See for similar surveys Alc., *Didask.*, p. 9.11-10.43 Whittaker; Amm., *In An. Pr.*, pp. 5.10-7.25 Wallies (CAG IV.6); Philop., *In An. Pr.*, pp. 5.16-6.1 Wallies (CAG XIII.2). On the background of analysis in mathematics see e.g. J. Hintikka – U. Remes, *The Method of Analysis. Its Geometrical Origin and Its General Significance*, D. Reidel Publishing Company, Dordrecht-Boston 1974; M. Otte – M. Panza (eds.), *Analysis and Synthesis in Mathematics*, Kluwer Academic Publishers, Dordrecht [etc.] 1997; for analysis in Aristotle compare the different approaches in P.H. Byrne, *Analysis and Science in Aristotle*, SUNY Press, New York 1997; M. Crubellier, “The Programme of the Aristotelian *Analytics*”, in C. Dégremon – L. Keiff – H. Rückert (eds.), *Dialogues, Logics and Other Strange Things: Essays in honour of Shabid Rahman*, College Publications, London 2008, pp. 121-48; G. Striker, “The ‘Analysis’ of Aristotle’s *Analytics*”, in G. Striker (ed.), *From Aristotle to Cicero: Essays on Ancient Philosophy*, Oxford U.P., Oxford 2022, p. 88-101; for analysis in the commentators see L.P. Schrenk, “Proof and Discovery in Aristotle and the Later Greek Tradition: A Prolegomenon to a Study of Analysis and Synthesis”, in L.P. Schrenk (ed.), *Aristotle in Late Antiquity*, Catholic University of America Press, Washington 1994, p. 92-108.

**T2:** They are called *Analytically* because the reduction (*anagōgē*) of any compound to the things from which it is compounded is called analysis. Analysing is the converse of compounding (*sunthesis*); for compounding is a route from the principles to what depends on them, whereas analysing is a return route from the end up to the principles.

1. Geometers are said to analyse when they begin from the conclusion and proceed in order through the assumptions made for the proof of the conclusion until they bring the problem back to its principles.
2. Again, if you reduce compound bodies to simple bodies, you use analysis; and
3. if you reduce each of the simple bodies to the things on which their being depends—that is to say, to matter and form—you are analysing.
4. Again, if you divide speech into the parts of speech, or the parts of speech into their syllables, or the syllables into letters, you are analysing.
5. If you reduce compound syllogisms to simple ones you are said to analyse in a special sense of the word, and so too
6. if you reduce simple syllogisms to the premisses on which their being depends.
7. Again, reducing imperfect syllogisms to perfect ones is called analysing.
8. Again, the reduction of a given syllogism to its appropriate figure is said to be analysis – and it is in this sense of analysis in particular that the books are entitled *Analytically*. For at the end of the first book (*An. Pr.*, I 32, 46 b 40 – 47 b 14) Aristotle outlines a method for us by means of which we shall be able to do this – and he also explains how we shall be able to effect the reduction of simple syllogisms to the appropriate premisses on which their being depends (*An. Pr.* I 33, 47 b 15 – 50 a 4). We shall also find him saying how compound syllogisms come from simple ones and how we may reduce the former to the latter (*An. Pr.* I 42, 50 a 5-15). The books in which he studies the analysis of syllogisms he entitles *Prior Analytically*; those in which he studies the analysis of demonstrations he also calls *Analytically*, but *Posterior Analytically*.<sup>21</sup>

The introduction leading up to the list of types of analysis offers us a description of the general direction of any argument leading from a composite to its composing principles.

<sup>21</sup> Alex. Aprod., *In An. Pr.*, pp. 7.12-8.2 Wallies: Ἀναλυτικά δέ, ὅτι ἡ παντός συνθέτου εἰς τὰ, ἐξ ὧν ἡ σύνθεσις αὐτῶν, ἀναγωγὴ ἀνάλυσις καλεῖται. ἀντεστραμμένως γὰρ ἡ ἀνάλυσις ἔχει τῆ συνθέσει· ἡ μὲν γὰρ σύνθεσις ἀπὸ τῶν ἀρχῶν ὁδὸς ἐστὶν ἐπὶ τὰ ἐκ τῶν ἀρχῶν, ἡ δὲ ἀνάλυσις ἐπάνοδος ἐστὶν ἀπὸ τοῦ τέλους ἐπὶ τὰς ἀρχάς· [1] οἷ τε γὰρ γεωμέτραι ἀναλύειν λέγονται, ὅταν ἀπὸ τοῦ συμπεράσματος ἀρξάμενοι κατὰ τὴν τάξιν τῶν εἰς τὴν τοῦ συμπεράσματος δεῖξιν ληφθέντων ἐπὶ τὰς ἀρχάς καὶ τὸ πρόβλημα ἀνίωσιν. [2] ἀλλὰ καὶ ὁ τὰ σύνθετα σώματα ἀνάγων εἰς τὰ ἀπλᾶ σώματα ἀναλύσει χρῆται καὶ [3] ὁ τῶν ἀπλῶν ἕκαστον εἰς τὰ, ἐξ ὧν αὐτοῖς τὸ εἶναι, ὅπερ ἐστὶν ὕλη καὶ εἶδος, ἀναλύει. [4] ἀλλὰ καὶ ὁ τὸν λόγον εἰς τὰ μέρη τοῦ λόγου διαίρων καὶ ὁ τὰ μέρη τοῦ λόγου εἰς τὰς συλλαβάς καὶ ὁ ταῦτα εἰς τὰ στοιχεῖα ἀναλύει. [5] ἀναλύειν δὲ ἰδίως λέγονται καὶ οἱ τοὺς συνθέτους συλλογισμοὺς ἀναλύοντες εἰς τοὺς ἀπλοῦς. [6] ἀλλὰ καὶ οἱ τοὺς ἀπλοῦς εἰς τὰς προτάσεις, ἐξ ὧν αὐτοῖς τὸ εἶναι. [7] ἀλλὰ καὶ τὸ τοὺς ἀτελεῖς συλλογισμοὺς εἰς τοὺς τελείους ἀνάγειν ἀναλύειν καλεῖται. [8] ἀλλὰ καὶ τὴν τῶν τιθεμένων συλλογισμῶν εἰς τὰ οἰκεία σχήματα ἀναγωγὴν ἀνάλυσιν λέγουσι. καὶ κατὰ τοῦτο τὸ σημαίνονμενον τῆς ἀναλύσεως μάλιστα Ἀναλυτικά καὶ ταῦτα ἐπιγράφεται· ὑπογράφει γὰρ τινὰ ἡμῖν μέθοδον ἐπὶ τέλει τοῦ πρώτου, δι' ἧς τοῦτο ποιεῖν δυνησόμεθα. ἀλλὰ καὶ πῶς τὴν τῶν ἀπλῶν συλλογισμῶν εἰς τὰς οἰκείας προτάσεις, ἐξ ὧν αὐτοῖς τὸ εἶναι, καὶ αὐτῶν, ἀναγωγὴν ποιεῖν δυνησόμεθα. εὐρήσομεν δὲ τινὰ αὐτῶν λέγοντα, καὶ πῶς οἱ σύνθετοι συλλογισμοὶ γίνονται ἐκ τῶν ἀπλῶν, καὶ πῶς αὐτοῖς εἰς ἐκείνους ἀνάξομεν. ἐν οἷς μὲν οὖν περὶ τῆς τῶν συλλογισμῶν ἀναλύσεως πεπραγμάτευται, ταῦτα Ἀναλυτικά Πρώτερα, ἐν οἷς δὲ περὶ τῆς τῶν ἀποδείξεων, Ἀναλυτικά μὲν καὶ αὐτά, ὕστερα δὲ ἐπιγράφει. Tr. J. Barnes et al., *Alexander of Aphrodisias: On Aristotle Prior Analytics 1.1-7: 1-7*, Duckworth, London 1991 (Ancient Commentators on Aristotle), pp. 49-50.

This is well-known from Aristotle's *Physics* I.1: it is proper method to work from what is better known to us (composites as they present themselves in sense perception) to what is better known by nature (the universal principles).<sup>22</sup> In the words of the famous last chapter of the *Posterior Analytics*: in order to arrive at the state of knowing principles of a science (*nous*) we have to start from our innate discriminative power that is sense perception, which we can trust will lead to the grasp of universal principles by induction.<sup>23</sup> If we want to have knowledge of the very first divine principle, we need to push this approach to its limits. In similar empiricist terms *Metaph.* I 1-2 starts the search for the principles which *sophia* or first philosophy sets out to study, which will lead to the 'principle on which the heavens and nature depend' (*Metaph.* XII 7, 1072 b 13-14). In general terms, then, it will be clear why the direction of an argument establishing the existence and properties of the highest principle must qualify as analysis.<sup>24</sup>

The first type of analysis in **T1** pays homage to geometrical analysis, but in this form it does not seem to be used by Alexander himself. Occasionally Alexander refers to analysis into material constituents (2 and 4)<sup>25</sup> and analysis into matter and form (3).<sup>26</sup> Unsurprisingly, Alexander's use of the term analysis in the Commentary on the *Prior Analytics* only concerns types 5-8.<sup>27</sup> Together they constitute the majority of the instances of 'analysis' in the Alexandrian corpus.

Let us return to *Quaest.* I 1. A small difference between the text of **T1** and its rendering in Michael in *Metaph.* raises the question which part exactly of the whole argument is supposed to be analysis.

Alexander *Quaest.* I.1, p. 4.4 has: "This is shown by analysis" (ἡ δεῖξις κατὰ ἀνάλυσιν), which suggests that analysis will be used specifically to show that the divine body is moved by the first principle by thinking and desiring it (see **T1**). If so, the analysis to the first principle will probably start with the sentences following **T1**, i.e. by specifying the required properties of the first principle: "That [the first principle] is the first intelligible thing and the most [intelligible], and the first object of desire and, most of all, the form that causes the circular movement, might be shown from this (ἐντεῦθεν)" (tr. Sharples [above, n. 6], p. 18).

Michael, *In Metaph.* XII 7, p. 686.35-36, however, has "The proof has taken place through analysis" (ἡ δὲ δεῖξις κατὰ ἀνάλυσιν γέγονεν).<sup>28</sup> The verb highlights Michael's insistence that

<sup>22</sup> Arist., *Phys.* I 1, 184 a 1-26.

<sup>23</sup> Arist., *An. Post.* II 19, 99 b 17ff (with reference to *An. Post.* I 2, 72 a 25 – b 4), note 100 b 10-11. In *An. Post.* book II Aristotle has already discussed various strategies to arrive at the definitions that constitute the main principles of a science. Cf. R.D. McKirahan, *Principles and Proofs. Aristotle's Theory of Demonstrative Science*, Princeton U.P., Princeton 1992, Ch. XVIII.

<sup>24</sup> This formulation passes over an ambiguity present in **T1**: is the aim to establish the existence of the first principle (p. 4.5, and the title of *Quaest.* I.1 which was added later), or its nature (φύσις) (p. 4.7), or is the aim rather more limited, viz. to show that the divine body will be moved by the First Mover through thinking of it and having desire and appetite for become similar to it (p. 4.1-4), which is what actually follows. In sum, the argument as a whole takes care of all of these aspects, as did Aristotle's argument.

<sup>25</sup> Cf. Alex. Aphrod., *Mixt.*, p. 4.11-13 Groisard; *In Metaph.*, p. 55.7 Hayduck; *Quaest.* II.20, pp. 64.34-65.7.

<sup>26</sup> Cf. Alex. Aphrod., *Quaest.* II.13, p. 58.16.

<sup>27</sup> The same applies to Alex. Aphrod., *In Top.*, pp. 42.27-28, 64.10, 526.11.23 Wallies; *In An. Post.* XXII.14-16 Wallies.

<sup>28</sup> Miller does not translate the verb, but his translation continues "That the form which is capable of bringing about circular movement is intelligible first and foremost, and also an object of desire first and foremost, may be proven from the foregoing (ἐντεῦθεν)". Although the translation may express Michael's intentions, it is hardly ten-

the proof of the first principle already starts at the beginning of *Metaph.* XII 6.<sup>29</sup> The question where the proof of the first principle starts is still a moot point in modern interpretations of *Metaph.* XII 6-7.<sup>30</sup> If so, and given that the first part of *Quaest.* I.1 covers part of the argument of *Metaph.* XII 6, we should then take the reference to analysis to include all of *Quaest.* I.1, not just the second part.

Before we can consider Alexander's position on this issue, there is a further difference between *Quaest.* I.1 and Michael's commentary we should note. Michael, *In Metaph.*, p. 693.12-13, Hayduck explicitly labels the argument starting at *Metaph.* XII 7, 1072 a 21ff. as a further case of analysis. In short the argument runs as follows: every motion requires a mover, a moved, and something in between (a moved mover).<sup>31</sup> If the first heaven (moved mover) is moved everlastingly, and it moves the planetary body as a whole (moved), the analysis requires an 'everlasting thing which imparts movement without being moved, being a substance and actuality'.<sup>32</sup> As we have seen above, precisely this argument is left out of *Quaest.* I.1, so we have no evidence whether Alexander would have endorsed that this argument is a case of analysis, too. The question remains: is only the second half of *Quaest.* I.1 an instance of analysis, or the entire text? If the latter: does Alexander want us to believe that Aristotle has been using analysis in all of *Metaph.* XII 6-7, or even in all of *Phys.* VIII, just because the argument works towards establishing the first principle to which all else is posterior?

We can gain more insight from Alexander's discussion of *Topics* I 2, 101 a 25 – b 4 on the uses of dialectic, the third of which concerns the philosophical sciences (πρὸς τὰς κατὰ φιλοσοφίαν ἐπιστήμας).<sup>33</sup> Under this heading Aristotle mentions two options: dialectic raises difficulties on both sides, so as to discern both truth and falsehood on every point more easily;<sup>34</sup> and dialectic has a role regarding the first principles of each science (πρὸς τὰ πρῶτα τῶν περὶ ἐκάστην ἐπιστήμην).<sup>35</sup>

In his commentary on this passage Alexander elaborates that the dialectician's art of raising difficulties also has its uses for discerning truth and falsehood in the disciplines of philosophy itself, viz. ethics, logic, and physics.<sup>36</sup> He then discusses the relevance of dialectic first for the

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able given that the relevant proof does not precede, but follows.

<sup>29</sup> Michael, *In Metaph.* XII 6, p. 685.27-28 Hayduck: "From here on (ἐντεῦθεν sic!) Aristotle discusses the primary cause and first substance, which in this work he also calls a god (*theos*)"; so again at p. 687.25 Hayduck.

<sup>30</sup> For analysis and discussion see E. Berti, "Unmoved Mover(s) as Efficient Cause(s) in *Metaphysics* Λ 6", in M. Frede – D. Charles (eds.), *Aristotle's Metaphysics Lambda*, Oxford U.P., Oxford 2000, pp. 181-206 and A. Laks, "Metaphysics Λ 7." in Frede–Charles (eds.), *Aristotle's Metaphysics Lambda*, pp. 207-43.

<sup>31</sup> This passage has a close parallel in Arist., *Phys.* VIII 5, 256 b 20-24.

<sup>32</sup> Miller Jr., 'Alexander' *On Aristotle Metaphysics 12* (above, n. 1) p. 160 n. 178 suggests that analysis is a method of distinguishing the factors involved in a case of causation. However, we have seen that Alexander does not mention causation in his discussion of the types of analysis. It seems to me that this, too, is a dialectical argument from an *endoxon* endorsed by Aristotle.

<sup>33</sup> Arist., *Top.* I 2, 101 a 27-28; a 34 – b 4.

<sup>34</sup> Hence Alex. Aphrod., *In Metaph.*, pp. 173.27-174.4 Hayduck refers to the *Topics* at the start of his commentary on *Metaph.* III, which he regards as the real beginning of the metaphysical quest for principles. Cf. G. Guyomarc'h, "Métaphysique et Organon selon Alexandre d'Aphrodise. L'utilité de la logique pour la philosophie première", in A. Balansard – A. Jaulin (eds.), *Alexandre d'Aphrodise et la métaphysique aristotélicienne*, Peeters, Leuven 2017 (Aristote. Traductions et Études), pp. 83-112, part. pp. 83-4.

<sup>35</sup> Arist., *Top.* I 2, 101 a 36-37.

<sup>36</sup> Alex. Aphrod., *In Top.*, p. 28.25-26 Wallies. At p. 29.2-5 Alexander connects this benefit to the dialectical training mentioned in Plat., *Parm.* 135 D.

discovery or defense of principles in other sciences, by means of received opinions (*endoxa*) and induction (*In Top.*, pp. 29.23-30.5 Wallies). Alexander goes out of his way to provide eight examples of how a dialectician could come to the aid of a geometer whose principles are contested (*In Top.*, pp. 30.19-31.31 Wallies). In between is an interesting application of the use of dialectic in philosophy:

**T3:** So the scientist will speak of the principles proper to his science as a dialectician, or the dialectician will do this on his behalf. And if dialectic is useful with a view to the first things, the principles of each science, it will be so, as Aristotle says, for philosophy and its principles as well, providing its usefulness there too. And so this fourth use of dialectic can be subsumed under its usefulness for philosophy, as an explicit addition that dialectic is in this respect useful for other sciences in the same way that it is for philosophy.

Aristotle himself often when proving things in philosophy, adds ‘logically’ (*logikōs*)<sup>37</sup> in the sense of ‘dialectically’, implying that there are also things in philosophy which require this kind of proofs.

An example of this is that “every body is delimited by a surface”. This is something approved (*endoxon*), given the supposition that a surface is the limit of a body, which Aristotle has used in his *Physics* (III 5, 204 b 4-7) to show that there is no unlimited body. By adding to this that “nothing which is delimited is unlimited” he has deduced that “therefore: no body is unlimited”.<sup>38</sup>

Since according to Alexander metaphysics is itself a full-blown science (*ἐπιστήμη*),<sup>39</sup> we can expect that dialectic also applies to the search for the first principle of being qua being. The example at the end of **T3** is illuminating. Aristotle is said to prove the conclusion “no body is unlimited” dialectically by analysing it into its premises. One is the generally agreed account of body as delimited by a surface (an *endoxon* endorsed by Aristotle),<sup>40</sup> the second the self-evident claim that nothing which is delimited (*hōrismenon*) is unlimited (*apeiron*).

On another occasion I have argued that in Alexander’s commentary on *Metaph.* I 1-2 we see him combining dialectical starting points, *endoxa*, general agreement, and even

<sup>37</sup> Relevant examples in Aristotle are *Metaph.* VII.4, 1029 b 13; XII.1, 1069 a 28; *APo* I.22, 84 b 2; I.32, 88 a 19; *GC* 316 a 11; *Phys.* VIII 8, 264 a 8; III 5, 204 b 4.

<sup>38</sup> Alex. Aphrod., *In Top.*, p. 30.5-14 Wallies: ὡς διαλεκτικὸς οὖν περὶ τῶν ἀρχῶν τῶν ἰδίων ὁ ἐπιστήμων ἐρεῖ, ἢ ὁ διαλεκτικὸς ὑπὲρ αὐτοῦ. εἰ δὲ πρὸς τὰ πρῶτα καὶ τὰς καθ’ ἑκάστην ἐπιστήμην ἀρχὰς ἐστὶ χρῆσιμος, εἴη ἂν, ὡς εἶπε, καὶ πρὸς φιλοσοφίαν τε καὶ τὰς ταύτης ἀρχὰς, παρεχομένη καὶ ταύτη τὸ χρῆσιμον. καὶ οὕτως ἂν δύναιτο καὶ τὸ τέταρτον τοῦτο ὑπάγεσθαι τῷ πρὸς φιλοσοφίαν χρῆσιμῷ, προσκεῖσθαι δὲ αὐτῷ τὸ ὅτι ὁμοίως φιλοσοφία κατὰ τοῦτο καὶ πρὸς ἄλλας ἐπιστήμας ἐστὶ χρῆσιμος ἢ διαλεκτική. καὶ αὐτὸς δὲ πολλάκις δεικνύς τινα τῶν κατὰ φιλοσοφίαν προστίθησι τὸ “λογικῶς” λέγων διαλεκτικῶς, ὡς δεομένων τινῶν τῶν κατὰ φιλοσοφίαν καὶ τοιοῦτων δείξεων. οἷα ἐστὶ καὶ ἡ τοιαύτη: “πᾶν σῶμα ἐπιπέδῳ ὄρισται”, ὃ ἐστὶν ἔνδοξον διὰ τὸ κεῖσθαι σώματος πέρας εἶναι τὴν ἐπιφάνειαν, ἢ ἐχρήσατο ἐν Φυσικοῦς δεικνύς ὅτι μὴ ἐστὶν ἄπειρόν τι σῶμα· ἢ προσθεῖς τὸ “οὐδὲν δὲ ὄρισμένον ἄπειρον” “οὐδὲν ἄρα σῶμα ἄπειρον” συνήγαγεν. Tr. J.M. Van Ophuijsen, *Alexander of Aphrodisias: On Aristotle Topics 1*, Duckworth, London 2001 (Ancient Commentators on Aristotle), p. 33.

<sup>39</sup> See e.g. Alex. Aphrod., *In Metaph.*, pp. 10.23-11.2; 19.33-20.3 Hayduck. For metaphysics as a science in Alexander see e.g. M. Bonelli, *Alessandro di Afrosidia e la metafisica come scienza dimostrativa*, Bibliopolis, Napoli 2001 (Elenchos 35), Guyomarc’h, *L’unité de la métaphysique selon Alexandre d’Aphrodise* (above, n. 1), Ch. 2.

<sup>40</sup> Cf. Arist., *Phys.* 204 b 5-6: “For if the account of body is bounded by planes ...”.

axioms into a comprehensive Peripatetic concept of common notions that can serve as reliable starting points of deductive arguments.<sup>41</sup> T3 gives further support to this tendency in Alexander to emphasize the presence of all kinds of dialectical argument in Aristotle's works. When establishing first principles this procedure is no doubt even better warranted by Aristotelian examples.

Hence I propose, first, to regard Alexander's use of the term analysis in *Quaest.* I.1 from this perspective. The arguments he collects from *Metaph.* XII 6-7 and *Phys.* III 5 and VIII are mostly deductive arguments, using premises that Aristotle has proven elsewhere, or that may be adopted as more or less commonly endorsed *endoxa*, or even from induction.<sup>42</sup> Together they constitute attempts to say more about the existence and nature of the first principle by means of various approaches: analysis is a tool of dialectic serving philosophical goals.

These observations further suggest that the second part of *Quaest.* I.1—which Alexander's use of the term analysis in line 4.4 seems to point forward to—can be regarded as a more precise instance of analysis in the sense of type 3 (see T2): "... if you reduce each of the simple bodies to the things on which their being depends—that is to say, to matter and form—you are analysing".<sup>43</sup> We have seen how the second part of the *quaestio* sets off form against matter, and argues how substantial form is prior "for it is on account of this [viz. form in the category of substance] that the others, too exist" (p. 4.23-24).<sup>44</sup>

Although *Quaestio* I.1 does not mention *De Caelo*, *De Anima* or *Categories* by name, Alexander marshalls insights Aristotle proposed in all of these works to produce new, or freshly connected, arguments that bring the debate on the relation between the first principle, the heavens and the sublunary realm to a more satisfactory solution. In this way he brings Peripatetic philosophy one step closer to explaining the whole universe by means of a single hylomorphic framework.<sup>45</sup>

<sup>41</sup> See F.A.J. de Haas, "Deduction and Common Notions in Alexander's Commentary on Aristotle's *Metaphysics* a 1–2", *History of Philosophy & Logical Analysis* 24 (2021), pp. 71-102.

<sup>42</sup> Note how Michael, *In Metaph.*, p. 693.14-16 Hayduck (commenting on 1072 a 22) supports the eternity of circular motion: "And the fact that circular movement is everlasting is clear not only by reason and demonstration but also by fact (*ergon*) and by tradition from our forebears". This could well be another instance of Alexander's sensitivity to dialectical argument in the service of philosophy.

<sup>43</sup> Alex. Aphrod., *In An. Pr.*, p. 7.19-20 Wallies: (...) και ὁ τῶν ἀπλῶν ἕκαστον εἰς τὰ, ἐξ ὧν αὐτοῦς τὸ εἶναι, ὅπερ ἐστὶν ὕλη και εἶδος, ἀναλύει.

<sup>44</sup> Alex. Aphrod., *Quaest.* I.1, p. 4.23-24: διὰ γὰρ τοῦτο και τὰ ἄλλα ἐστὶν.

<sup>45</sup> In a forthcoming paper I have highlighted further steps towards this aim in Alexander. Cf. F.A.J. de Haas, "Alexander of Aphrodisias on the first cause, divine power, the city and the household", in M.G. Mouzala (ed.), *Nature and Human Nature in Ancient Greek Philosophy and its Reception*, Sidestone Press, Leiden forthcoming (Publications of the Netherlands Institute at Athens).