

RESEARCH ARTICLE

Neoplatonists on the place of Aristotle's biological works

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Abstract

According to the Neoplatonic classification of Aristotle's writings, it has often been claimed that his biological works were excluded from his physical writings, and do not form a part of Neoplatonic school curricula. In this paper, I shall challenge this view, arguing that there are reasonable indications that the Neoplatonists regarded most of Aristotle's biological works (apart from the *History of Animals*) as a proper part of his natural philosophy, and as works which deserved serious study.

Keywords: Neoplatonism; Aristotle; biology; classification of writings

I. Introduction

It is generally held that the Neoplatonists had little interest in biological studies.¹ According to many scholars, particularly Ilsetraut Hadot, one indication of this lack of interest is the fact that Neoplatonic commentators completely dismissed Aristotle's biological works² in their introductions to Aristotle's philosophy, which are preserved in the preface to five Neoplatonic Greek commentaries on the *Categories*. There these Neoplatonists introduced a kind of classification of Aristotle's writings into three types: general, particular and intermediary writings.³ According to these commentators, in the study of Aristotle attention should be drawn only to his general works, particularly his school treatises (ἀκροαματικά). However, unlike modern readers, who may customarily consider Aristotle's biological works, like most of his writings that have come down to us, to be among his school treatises,⁴ these Neoplatonists seem to have considered the biological works as merely intermediary writings, and thus excluded them from the Neoplatonic work programme and school curricula.

In this paper, I aim to challenge this picture, and to re-establish the proper place of Aristotle's biology within his natural philosophy. I shall argue that there is no conclusive reason to think that in proposing this threefold classification, the Neoplatonists regarded *all* of Aristotle's extant biological works as merely intermediary writings; rather, they are

¹ Cf. especially Wilberding (2017) 2–3.

² By 'biological' works, I refer only to Aristotle's zoological works in this paper (nor do I discuss the *Parva naturalia*), for we do not have Aristotle's genuine writings on plants. Although the Neoplatonists did mention writings of Aristotle on plants, it is unclear to what particular works they were referring; see Kupreeva (2011) 86 n.25.

³ For an illustration of the whole scheme of this classification, see, for example, Moraux (1973) 71; Hadot (1990) 65.

⁴ Cf. Moraux (1973) 90.

most likely to have included only the *History of Animals* in the category of intermediary writings. As for the other biological works, I shall propose that there is good evidence to suggest that these, together with the *Physics*, *De caelo*, *On Generation and Corruption* and so forth, were considered to be physical works in the Neoplatonic tradition. For these reasons, I conclude that the Neoplatonists were still engaged in studying (most of) Aristotle's biological works, such as the *Parts of Animals*, *Generation of Animals* and *Movement of Animals*, as a part of their school curricula, and that they did not dismiss the value of biological investigations in general,⁵ although they never wrote any commentaries on Aristotle's biological works.⁶

Nevertheless, one may suggest that it is one thing for the Neoplatonists to (1) include Aristotle's biological works in their school curricula, while it is another to claim that they (2) read these biological works in one way or another. Admittedly, the exclusion of some writings from Neoplatonic curricula does not imply that the Neoplatonists would not have read them at all. However, what I want to emphasize in this paper is that Neoplatonic commentators read these biological works in a philosophical way,⁷ rather than simply treating them as 'reference works' that lay outside their philosophical investigations and could only provide additional insights.⁸ I think that in regarding Aristotle's biological works as part of their philosophical programme,⁹ the Neoplatonists also accepted them as part of their school curricula.

In what follows, I shall first (in section II) present this scheme of classification of Aristotle's writings as found in different commentaries, and formulate the reasons proposed by these scholars, according to whom *all* of Aristotle's biological works should belong to the category of intermediary works.

Then, in section III, I will argue that, based on these texts, the evidence is far from decisive for establishing that these Neoplatonists relegated Aristotle's biological works (except the *History of Animals*) to the category of intermediary writings. These passages can only show that the Neoplatonists may have considered the *History of Animals* a documentary or descriptive work, and considered it an intermediary work, just as they did the *Constitution of Athens*. Although Philoponus took the *Generation of Animals* for an intermediary work, I propose that he had his own reasons. Moreover, I think that (1) Philoponus' opinion does not necessarily reflect the general view of the Neoplatonic tradition, and (2) regarding the

⁵ As is suggested by Sorabji (2014) 35, anatomy may also have been studied in Alexandrian Neoplatonic classrooms.

⁶ Admittedly, if a work of Aristotle was not part of the Neoplatonic school curricula, there would have been little or no incentive for these Neoplatonists to write a commentary on it. However, the converse may not be the case: if there is no Neoplatonic commentary on a certain work of Aristotle, it does not necessarily follow that it was excluded from the Neoplatonic school curricula. Aristotle's ethical writings are notable examples. The Neoplatonic commentators did not write on Aristotle's ethical works (aside from a dubious reference to a commentary by Porphyry in the Arabic tradition; see Karamanolis (2006) 306–08 on this point), but it is clear that Aristotle's ethics was a part of the Neoplatonic school curricula; see, for example, Marinus, *Vit. Procl.* 13; Ammon. *in Cat.* 5.5–6, 5.31–6.8 Busse; Philoponus, *in Cat.* 5.6–7, 5.15–33 Busse; *Simpl. in Cat.* 4.26–27, 5.3–6.5 Kalbfleisch; Olympiodorus, *Proll.* 7.35–36, 8.29–9.13 Busse; Zacharias Scholasticus, *Ammon.* 942–46 Colonna.

⁷ As I shall spell out later, by 'a philosophical way' I mean that Aristotle's biological works can contribute *crucially* to the Neoplatonic discussions of the theory of soul, such as the issue of whether the enquiry in the *De anima* is a part of natural philosophy or of first philosophy. That is to say, reading the biological works not only enabled the Neoplatonists to acquire some causal knowledge about living beings (*cf.*, for example, *Simpl. in Phys.* 3.8–9 Diels: αἰτιολογικῶς), but can also shed light on the discussions about non-negligible issues in Neoplatonic philosophy.

⁸ See Hellmann (2006); see also how these commentators make use of the *History of Animals* below.

⁹ It may be objected that the Neoplatonists merely used the writings on animals in their interpretation of Aristotle's philosophy. However, it is hard to deny that these Neoplatonists' exegeses of Aristotle's writings constitute a significant and integral part of Neoplatonic philosophy in Late Antiquity.

Generation of Animals as an intermediary work does not imply that he excluded it from Aristotle's physical works or considered it unworthy of study.

In section IV, I shall turn to Neoplatonic commentaries on Aristotle's physical works, and I will argue that there are many indications that these Neoplatonists regarded Aristotle's biological works (with the exception of the *History of Animals*) as proper physical works. When they explicated the position of relevant treatises of Aristotle's natural philosophy, they almost always treated his biological works as an intrinsic part of the study of nature. Against some scholars' interpretations, I propose that the Neoplatonists did not simply follow the Peripatetic tradition (especially Alexander of Aphrodisias), 'forgetting' that it was inconsistent with their own view. They would have criticized Alexander, and presented their own alternatives, if they disagreed with him on this point.

More importantly, I shall argue that the *Parts of Animals* and the *Generation of Animals* are significant for certain discussions concerning Aristotle's theory of soul in Neoplatonism, such as the problem of whether the study of the soul belongs to natural philosophy or first philosophy, and the issue of whether some part of the soul is separable from the body. Finally, *contra* Hadot, although Proclus may have thought that Aristotle's enquiries in these biological works were far inferior to what Plato did in his *Timaeus*, because he did not engage adequately with intelligible beings and causes, it does not follow from this appraisal that all biological works would have been excluded from Aristotle's school treatises. Proclus also downplays some other areas in Aristotle's natural philosophy, such as the discussion in *On Generation and Corruption* and the *Meteorology*, but this judgement did not lead later Neoplatonists to exclude these works from Aristotle's physical writings. Furthermore, I will provide some evidence that Proclus himself was fairly well acquainted with Aristotle's biological works, which suggests that he did not simply reject these writings in his own philosophical enterprise.

II. Texts and reasons for excluding biological works

In the prefaces to five extant Neoplatonic commentaries on Aristotle's *Categories*, the commentators all mention a kind of classification of Aristotle's writings which, according to Elias¹⁰ (*in Cat.* 107. 24–26 Busse) can be traced back to Proclus.¹¹ Within this scheme of classification, there are three kinds of work by Aristotle: particular, general and intermediary works. What is relevant for this paper is that the school treatises (including the writings on theoretical philosophy, practical philosophy and logic) belonged to the general works, and were the Aristotelian works that the Neoplatonists considered to be worthy of proper study. Today it is customary for us to consider all of Aristotle's biological works as a part of his physical works, that together they belong to Aristotle's natural philosophy, which is further a branch of his theoretical philosophy. However, it seems that these Neoplatonists might have regarded Aristotle's writings on biology as merely intermediary works, which implies that these commentators omitted them from their work programmes. Here I shall first present the relevant passages on the classification of Aristotle's writings from these Neoplatonic commentaries.

¹⁰ I shall not address the debate on the identity of Elias and David, or the issue of the authorship of their works. See Luna et al. (2012) 1555–56 and Perkams (2018) 1912 (with further references) for discussion of Elias' report, in relation to Proclus' alleged work *Συναγωγή*.

¹¹ It is a point of highly controversial debate whether this scheme of classification was a Neoplatonic invention or dates back to a much earlier period. Yet even Moraux, who argues that this classification may largely go back to Andronicus, also acknowledges that the category of intermediary works is rarely found in antiquity, outside of these Neoplatonic commentaries; see Moraux (1973) 73. Therefore, I think at least the classification of works as intermediary is a Neoplatonic innovation.

T1: Let us [take up] the second [question] and produce a division of the Aristotelian writings. Now some of them are particular (μερικά), some are universal (καθόλου), and some are in between (μεταξύ) the universal and the particular. The particular are those that he wrote to someone in particular (ὄσα πρὸς τινὰς ἰδίᾳ), either letters or other such [writings]. The universal [are those] in which he enquired into the nature of things (περὶ τῆς τῶν πραγμάτων φύσεως ζητεῖ), such as the *De Anima*, *De Generatione et Corruptione*, and *De Caelo*. In between are the historical ones (περὶ ἱστορίας) that he wrote, such as the some two hundred and fifty constitutions written by him. He did not write these for anyone in particular (οὔτε πρὸς τινὰς ἰδίᾳ), nor are they universal (οὔτε καθόλου εἰσὶν) (for the *Constitution of Athens* or [those] of other [cities], for example, could not be universal) ... But let us put aside the particular and the in-between. Among the universal [works] some are systematic (συνταγματικά) and some are notebooks (ὑπομνηματικά) ... Some of the systematic [works] ... are in dialogue form, ... others are *in propria persona* ... The dialogues are also called popular (ἔξωτερικά), whereas the writings *in propria persona* are also [called] axiomatic (ἀξιωματικά) or school [works] (ἀκροαματικά) ... Among the school [works] some are theoretical, some are practical, and some instrumental ... Among the theoretical works, [there are] the theological, the mathematical, and the natural (φυσιολογικόν). (Ammon. *in Cat.* 3.21–5.5, tr. Cohen and Matthews (1991))

T2: Of the Aristotelian writings, some are particular, like the *Letters* written to one individual about some particular reality (πρὸς ἓνα τινὰ καὶ περὶ μερικοῦ τινος γεγραμμένοι πράγματος), while others are general. Still others are intermediary, like the investigations on plants and on animals (αἱ περὶ ζώων καὶ φυτῶν ἱστορίαι), which are about things which are not entirely particular (οὐ περὶ μερικῶν οὔσαι πάντη τινῶν), since they are about the species of animals (περὶ γὰρ εἰδῶν εἰσι ζώων). For the moment, however, let the particular and intermediary works remain undivided ... Of theoretical writings, some are theological, like the *Metaphysics*, while others have to do with the study of nature, like the *Physics* and the treatises following upon the *Physics*. (Simpl. *in Cat.* 4.10–25, tr. Chase (2003))

T3: Now some of Aristotle's writings are particular, others universal, and others intermediate between universal and particular. His particular writings are those written by him for specific individuals (πρὸς τινὰς ἰδίᾳ), i.e. his letters, which were collected by Andronicus and Artemon. His universal writings, on the other hand, are those in which he investigates the nature of reality (τὴν τῶν πραγμάτων φύσιν ζητεῖ). The *Histories* (αἱ ἱστορίαι) are his intermediate writings, for example the *History of Animals* (ἡ Περὶ ζώων ἱστορία) and the *Constitutions* (αἱ Πολιτεῖαι), 250 in number, in which the way of life of the Athenians and other nations is set out in detail ... But let us move on from the intermediate and particular writings and turn towards the universal ones in order to study their division ... The lecture courses called *Physics*, *On Generation and Corruption*, *On the Heavens*, *Meteorology*, and *On the Soul* treat natural science. (Olympiodorus, *Proll.* 6.9–7.33, tr. Gertz (2018))

T4: Among Aristotle's writings, some are particular, some are universal and some are intermediary. Particular works are not simply those which are written for a single person (for it is also possible to write for an individual on a general matter; and in this regard, *De mundo*, which is addressed to King Alexander, is a universal work); rather, I think particular works are written to one individual about some particular matter (περὶ ἑνὸς καὶ μερικοῦ καὶ πρὸς ἓνα), such as his letters ... And general works are those in which he discusses everything of one class (περὶ πάντων τῶν μονοειδῶν διαλαμβάνει), such as the *Physics* (which is about the whole of nature), *On Generation and Corruption*, *De caelo* and *Meteorology* (where he examines all meteorological

phenomena). Intermediary works are neither about general topics nor about particulars, but are those in which a multiplicity of things are discussed (μήτε περι πάντων μήτε περι ἐνὸς ἀλλὰ περι πλείονων διαλέγεται), like the *History*. There are two kinds of these: one is political, such as *Constitutions* ... the other is physical, such as the *History of Animals and Plants* (ἡ Περι φυτῶν καὶ ζώων ἱστορία). (Elias in *Cat.* 113.19–34, my translation)

T5a: Of the Aristotelian works, some are particular, such as his letters, some are general, e.g. *Physics*, *On the Soul*, etc., and some are in between, as *Constitutions* (αἱ Πολιτεῖαι) and *Investigations about Animals* (αἱ Περι ζώων ἱστορία). (Philoponus, in *Cat.* 3.9–11, tr. Sirkel et al. (2015))

T5b: Particular works, then, are those which he has written to someone personally (πρὸς τινὰ ἰδίως), for example, the letters, or those he wrote in response to questions by Alexander of Macedon about kingship and how to found colonies. General ones are, for example, *Physics* or *On Generation and Corruption*, for in treatises of that sort he discusses general matters (περι καθολικῶν). And there are those in between, like *On the Generation of Animals* (αἱ Περι γενέσεως ζώων), for one [of its parts] includes general remarks about animals (ἡ μὲν γὰρ περι ζώων ἔχει τὸ καθόλου), while another treats the particulars of each generation [of a sort of animal] taken on its own (ἡ δὲ περι πάσης ἀπλῶς γενέσεως τὸ μερικὸν ἔχει). (Philoponus, in *Cat.* 3.22–28, tr. Sirkel et al. (2015))

T5c: The physical works are, for instance, those very ones that are called *Physics*, *On Generation and Corruption*, and the like. (Philoponus, in *Cat.* 5.3–4, tr. Sirkel et al. (2015))

Many scholars claim that according to these Neoplatonists, the intermediary writings should include *all* of Aristotle's biological works,¹² which would make them not part of Aristotle's natural philosophy and school treatises. And they conclude that these works are excluded from Neoplatonists' school curricula, because the Neoplatonists were only interested in Aristotle's school treatises when they conducted relevant philosophical investigations. As can be noted from the translations above, the first reason why these scholars came to this conclusion may be that they accepted a wider interpretation of the term *historia*,¹³ which does not refer only to such works as the *History of Animals*, but to all investigations on animals generally.¹⁴ I think this argument crucially depends on the evidence of Philoponus, who mentions the *Generation of Animals* explicitly as an example of intermediary writings in T5b. Furthermore, these scholars also raise a theoretical consideration behind this scheme of classification. They hold that the Neoplatonic commentators thought that only what was intelligible and universal was worthy of proper study. However, according to these Neoplatonists, Aristotle's enquiries concerning animals were only based on the observation of sensible particulars, which are far removed from the level of first principles and the intelligible world. For this reason, animals are not proper objects of study: they provide no true knowledge, and the works on animals do not belong to Aristotle's general writings.¹⁵

¹² For example, Hadot (1990) 63–93 (developed from her 1987 article: 'La division néoplatonicienne des écrits d'Aristote'), especially 69–70; Hadot (1991) 178–81; Hadot (2015) 129; Chase (2003) 99 n.52; Sirkel et al. (2015) 121 n.11; Trizion (2018) 156; Hoffmann (2017) 153–57; Falcon (2021b) 255.

¹³ This is why I do not modify translators' different renderings of the titles of Aristotle's works throughout this paper.

¹⁴ See especially Hadot (1990) 69.

¹⁵ Hadot (1990) 68–70; Hadot (1991) 179; Hadot (2015) 129; Chase (2003) 99 n.52. Cf. also Hoffmann (2017) 165, 168–69.

However, in what follows, I shall argue that none of these three reasons is strong enough to exclude all of Aristotle's biological works from the category of physical works. What these Neoplatonists suggest is that only the *History of Animals* belongs to the category of intermediary works, for in their view it is merely a documentary work on different animals. I will first focus on the passages quoted above (section III); then I shall turn to Neoplatonic views on the place of Aristotle's physical works (section IV), where there are more positive indications that the Neoplatonists did value the study of Aristotle's biological writings.

III. The Neoplatonic classification reconsidered

In this section, I shall argue that if we leave Philoponus' explicit reference to the *Generation of Animals* aside, there is scant reason to suggest that all of Aristotle's biological works were considered intermediary works. Furthermore, I will suggest that Philoponus' reference to the *Generation of Animals* may reflect his own opinion, which was not necessarily shared by other Neoplatonists. Moreover, Philoponus' categorization of the *Generation of Animals* as an intermediary work does not guarantee that he dismissed the value of studying it and denied it a place in Aristotle's natural philosophy.

i. The issue of *historia*

It seems clear that if Philoponus had made no mention of the *Generation of Animals*, there would be no conclusive reason to adopt a wider interpretation of the word *historia*. Admittedly, *περὶ ζῴων ἱστορίαι* might mean the investigation of animals in general,¹⁶ which would include all of Aristotle's zoological works, but it could also refer specifically to the *History of Animals*.¹⁷ Judged from the context, there is no compelling reason to prefer a wider reading over a narrower reading; instead, as is suggested by Paul Moraux and many others,¹⁸ the example of the *Constitutions*, which appears in virtually all commentaries, may suggest that we should choose the narrower reading. The reason is that the *Constitutions* is generally viewed as a kind of record presenting the developments and details of constitutions of the polis, as is asserted by Ammonius and Olympiodorus. Similarly, it is more likely that, for these Neoplatonists, the *History of Animals* was a kind of documentary where Aristotle also recorded and displayed a variety of attributes of different animals. Whether this is the right interpretation of the *History of Animals* is another story,¹⁹ but at least we may suppose that the *History of Animals* is more likely than the other biological texts to be considered a work similar to the *Constitutions*. In other works, such as the *Parts of Animals*, *Generation of Animals* and the *Movement of Animals*, Aristotle presents general examinations of different animals, like their body parts, their modes of reproduction and their modes of movement. This characterization of Aristotle's biological works was also endorsed by these Neoplatonists, as can be inferred from a number of the passages quoted below (T7–9, T11–13).

¹⁶ But cf. Lennox (1991) 263 n.4.

¹⁷ Lennox (1994) 16–17 seems to suggest that the narrower reading of *historia* should be the norm for ancient commentators in the case of *History of Animals*. But Philoponus (or the Neoplatonic commentator) may use τῆ Περι ζῴων ἱστορίαι in one passage to denote the *Parva naturalia* (Philoponus, in *De an.* 591.23 Hayduck).

¹⁸ For example, Moraux (1973) 74; Düring (1957) 446; Westerink (1962) xxvi. Although some do not mention the *History of Animals* explicitly, when they comment on the intermediary works, their references to the *Constitutions* suggest that they prefer a narrower reading of *historia*.

¹⁹ For some contemporary interpretations of Aristotle's *History of Animals*, especially with regard to its aims and Aristotle's theoretical considerations informing it, see for example, Balme (1991) 13–20; Lennox (1991), especially 262–70, 279–88; Gotthelf (2012).

At this point, one may refer to Simplicius' reason for regarding αἱ περὶ ζώων καὶ φυτῶν ἱστορίαι as an intermediary work: '[these works] are about things which are not entirely particular, since they are about the species of animals' (*in Cat.* 4.12–13). If all investigations of animals in biological works concern the 'species of animals',²⁰ then they would naturally be characterized as intermediary works, which are neither as particular as the so-called *Letters*, nor as general as the school treatises. However, this reason does not accurately reflect Aristotle's research programme of biology.

At *Parts of Animals* 1.4 and 1.5, 645b20–27 (cf. *Part. an.* 1.1, 639a15–b7), Aristotle questions investigating different animal species, such as dogs and horses, separately, because it would require one to mention the same things repeatedly (for example, *Part. an.* 1.1, 639a25–29; 1.4, 644a28–36). He suggests instead that one may enquire into animals according to their 'common attributes' (see *Part. an.* 1.5, 645b33–646a1); and this is what he does in all of his biological works.

In the *History of Animals*, Aristotle also presents his discussion mainly through a focus on four common attributes of different animals: modes of life (οἱ βίοι), activities (αἱ πράξεις), characters (τὰ ἦθη) and parts (τὰ μέρη) (see, for example, *Hist. an.* 1.1, 487a11–12).²¹ If this is the case, then why would Simplicius claim that αἱ περὶ ζώων καὶ φυτῶν ἱστορίαι are about species? I think that this may suggest that what Simplicius has in mind here is specifically the *History of Animals* (probably together with a similar *History of Plants*),²² which is a consequence of the ancient reception of Aristotle's *History of Animals*. It is well known that Aristophanes of Byzantium composed an epitome of Aristotle's works on animals (τῶν Ἀριστοτέλους περὶ ζώων ἐπιτομή), which is primarily based on the *History of Animals*. However, Aristophanes rearranged the Aristotelian materials, presenting them by different kinds of animal, rather than by different attributes, as Aristotle originally did.²³ This fairly influential epitome (probably alongside other similar epitomes of Aristotle's biology)²⁴ may have given people in later periods of antiquity a misleading impression of Aristotle's approach in the *History of Animals*, that it is concerned with particular species of animals.²⁵ Therefore, there is no sufficient justification for the claim that περὶ ζώων ἱστορίαι must refer to all of Aristotle's biological works. Conversely, there are some good reasons to prefer the narrower interpretation of the word *historia*, which denotes only Aristotle's *History of Animals*.

ii. The alleged character of Aristotle's biological studies

In a similar fashion, without the support of Philoponus' categorization of the *Generation of Animals* as an intermediary work, the theoretical consideration regarding the 'particular' and 'observational' character of Aristotle's biological works may also become much less decisive.²⁶ I will return to this when I discuss Proclus' view on Aristotle's physical works below.

What I would like to emphasize here is the following: if one holds that the biological works other than the *History of Animals* are also intermediary works, because they are merely 'investigations based upon observation' of sensible particular beings, and because for the Neoplatonists only general and intelligible beings were true objects of proper

²⁰ Although rendering εἶδος as 'species' in Aristotle's biology may be misleading, see Lennox (2001) 122–23; since it does not affect my argument, I adhere to this translation.

²¹ See, for example, Gotthelf (2012) 270–72.

²² Cf. *Simpl. in Phys.* 3.7–10, where he proposes that there are two kinds of writings on plants, one of which is like the *History of Animals*.

²³ See, for example, Lennox (1994) 14–16; Hellmann (2006), especially 332–37; Hatzimichali (2021) 235–38.

²⁴ Cf. Sharples (1995) 34–37.

²⁵ This narrower reading of *historia* in Simplicius' commentary is further validated by excerpt T11 below.

²⁶ Cf. Hoffmann (2017) 165 n.40, who also seems to note the importance of examples for Hadot's contention.

study, then why cannot these same arguments be applied to other physical works mentioned explicitly by these Neoplatonic commentators, especially the *De caelo* and the *Meteorology*? On the one hand, Aristotle agreed that the object of knowledge should be general (see, for example, *An. post.* 1.8, 75b21–26); on the other hand, there is no reason to deny that the *De caelo* and the *Meteorology* are investigations based on observation of sensible particular things which aim to acquire knowledge of them.²⁷ The study of the heavens and stars depends on the perception of particular heavenly bodies, such as the observation of their movements (see, for example, *De caelo* 2.8, 290a7–30; 2.12, 291b34–292a9; 2.14, 296a34–b6 and 297b30–32).²⁸

Similarly, in the *Meteorology* Aristotle discusses a variety of meteorological phenomena such as rainbows and comets, and it is hard to imagine Aristotle thinking that these examinations could be conducted properly without the observation of ‘details’ of these sensible beings, as is the case in biology.²⁹ Although one may hold that the objects of study in the *De caelo* are eternal beings, which appear to be ‘nearer’ to the intelligible world than animals, this same justification cannot be made for the *Meteorology*, in which Aristotle also examines minerals, as was suggested by some Neoplatonists (see T7 below). In any case, if one were to insist that the studies based on the observation of sensible particulars and far detached from the intelligible beings should not belong to Aristotle’s general writings, then these Neoplatonists would also have excluded at least some of Aristotle’s physical works, such as the *De caelo* and the *Meteorology*, from his school treatises.

iii. Philoponus’ criterion of the classification of intermediary works

Now I shall turn to the commentary of Philoponus. It is generally acknowledged that some of Philoponus’ commentaries were taken from his teacher Ammonius’ lectures (supplemented with his own observations), while others were chiefly his own compositions.³⁰ It is highly debatable whether his commentary on the *Categories* is based on notes taken from Ammonius.³¹ For our purposes, it is important to note that no matter whether this is an ἀπὸ φωνῆς commentary derived from Ammonius or his own work, Philoponus could have made his own additions and changes to notes of Ammonius’ teachings. Also, in his own works, nothing prevented him from utilizing notes or records of his teacher’s lectures.³² I suggest that both Ammonius’ and Philoponus’ views feature in Philoponus’ commentary on the *Categories*.

In fact, I think Philoponus’ illustration of the classification of Aristotle’s writings reflects this ‘hybridity’. In excerpt T5a above, Philoponus first mentions three kinds of Aristotelian work: particular, general and intermediary writings. What is somewhat unusual is that unlike other commentators, Philoponus turns immediately to dividing the general works, without mentioning the reasons or criteria for this classification. Only after he has finished dividing the general works does he return to discuss the criteria

²⁷ Pace Hoffmann (2017) 155. There is no reason to think that only Aristotle’s biological works are based on particular observations which serve the discussion of general matters.

²⁸ This is also endorsed by Simplicius; see, for example, in *Cael.* 116.5–15, 117.23–30 Heiberg. For further discussion of the methodology of the *De caelo*, which involves the perception of sensible beings, see Bolton (2009); Falcon and Leunissen (2015).

²⁹ Wilson (2013) 73–92 argues notably that the method of the *Meteorology* is similar to that of the biological works. See also Freeland (1990), especially 72–75 for some examples of the use of observable data in the *Meteorology*.

³⁰ For some recent discussions on this issue, see Sorabji (2016); Golitsis (2019).

³¹ For instance, Golitsis (2019) thinks that it is Philoponus’ own work; but Sorabji (2016) seems to suggest that the commentary on the *Categories* belongs to his early work, which may be based on the notes of Ammonius’ lectures.

³² See especially Golitsis (2019) 182 n.62; Sorabji (2016) 392.

and give examples of each kind of text under this threefold classification, in excerpt T5b. His first examples of intermediary works are the *Constitutions* and αἱ περὶ ζώων ιστορίαι, similar to other Neoplatonic commentaries on the *Categories*. However, he then gives the example of the *Generation of Animals*, and offers a specific reason³³ for this attribution: ‘for one [of its parts] includes general remarks about animals, while another treats the particulars of each generation [of a sort of animal] taken on its own’ (ἡ μὲν γὰρ περὶ ζώων ἔχει τὸ καθόλου, ἡ δὲ περὶ πάσης ἀπλῶς γενέσεως τὸ μερικὸν ἔχει, Philoponus, in *Cat.* 3.27–28, tr. Sirkel et al. (2015)).

My suggestion is that the example of the *Generation of Animals*, and the reason he gives, is Philoponus’ own view. And that his view is divergent from other Neoplatonists’ views on the intermediary writings can be seen from the examples raised by Philoponus in T5a (the *Constitutions* and αἱ περὶ ζώων ιστορίαι). The criterion of intermediary works which Philoponus gives is fairly idiosyncratic.³⁴ Not only is it different from the reason or the criterion provided by other Neoplatonists, but it can hardly be applied to Aristotle’s other supposed intermediary work: the *Constitutions*. According to this scheme of classification, the particular works should (i) be addressed to a single individual, such as Alexander the Great, and (ii) deal with individual subjects, for otherwise, as Elias (in *Cat.* 113.21–23) says, *De mundo* would be a particular work, rather than a general work.³⁵ Moreover, the general works should (i) deal with some general matters and (ii) discuss the nature of things.³⁶

More importantly, for most Neoplatonists, the intermediary works should *neither* (i) be addressed to a specific individual and deal with particular issues *nor* (ii) deal with general subjects or the nature of things.³⁷ This can be attested from Elias’ formulation μῆτε περὶ πάντων μῆτε περὶ ἐνός (in *Cat.* 113.29–30), as well as from the explication of Ammonius: οὔτε πρὸς τινὰς ἰδίᾳ γέγραφεν, οὔτε καθόλου εἰσὶν (in *Cat.* 3.28–29). However, it is important to note that for Philoponus, the reason why the *Generation of Animals* is an intermediary work is that it can be viewed *both* as general *and* as particular to some extent, which is indicated by the ἡ μὲν ... ἡ δὲ construction (on the one hand, it is general, and on the other, it is particular, so it should be both general and particular in some way). This ‘both ... and’ criterion is clearly different from the ‘neither ... nor’ criterion envisaged by other commentators.³⁸

Although it is not entirely clear in what exact sense the *Generation of Animals* discusses general matters concerning animals and ‘treats the particulars of each generation [of a sort of animal] taken on its own’,³⁹ at least it can be postulated that this ‘both ... and’ criterion can hardly be applied to other supposed intermediary writings, especially the *Constitutions*. Arguably, one may think that, for example, the *Constitution of Athens* deals with a particular matter, but Ammonius explicitly denies that it is universal (οὔτε καθόλου

³³ It can be noted that generally these commentators only provided a single reason or criterion which can be applied to a variety of works, whereas Philoponus’ reason is specific to the *Generation of Animals*.

³⁴ Thus Moraux (1973) 74 n.45 accuses Philoponus of making a mistake (‘eine Verwechslung’) here.

³⁵ See Düring (1957) 445; Hadot (1990) 67–68.

³⁶ The relation between two criteria of the general writings is more likely to be disjunctive ((i) or (ii)), rather than conjunctive ((i) and (ii)), because these Neoplatonists also treated ὑπομνηματικά as a kind of general work, which may not always deal with the nature of things.

³⁷ See Moraux (1973) 73. Admittedly, it is uncertain what level of universality and what level of particularity of the subject matter these Neoplatonists were envisaging in this classification.

³⁸ One may hold that ‘saying “both particular and general” for Philoponus’ is the same as ‘saying “neither entirely particular nor entirely general” for Simplicius’. However, I think the point Simplicius is making is that no subject of discussion is either entirely particular or entirely general, whereas Philoponus seems to suggest that within one work, some subjects can be seen as general, while others can be seen as particular.

³⁹ Sirkel et al. (2015) 121 n.14 claim that the ἡ μὲν ... ἡ δὲ construction indicates that some books of the *Generation of Animals* talk about animals in general, while others discuss how each kind of animal is generated. This may not be the only possible interpretation. Cf. Hoffmann (2017) 156; Hadot (1990) 69 n.28 further emends ἡ μὲν ... ἡ δὲ to ἡ μὲν ... ἡ δὲ.

εἶσιν ... καθόλου οὐκ ἄν εἴη, in *Cat.* 3.29, 4.1).⁴⁰ On the other hand, as I have suggested, if one were to apply this 'both ... and' criterion to other biological works, then many, like *On Generation and Corruption* and the *De anima*, can also be regarded as intermediary works.⁴¹ Therefore, I suggest that Philoponus' example of the *Generation of Animals* reflects his own, divergent view of the classification of Aristotle's writings.

Although Philoponus treated the *Generation of Animals* as an intermediary work, this attribution does not lead him to dismiss the value of Aristotle's biology,⁴² nor did it prevent him from enquiring into the nature of living beings. It is generally accepted that Philoponus had a profound interest in biology and medicine, since he drew a considerable amount of material from Galen⁴³ in his commentary on the *De anima*.⁴⁴ Furthermore, there are many indications that Philoponus also made much use of Aristotle's *Generation of Animals* in his commentaries, although he explicitly considers it an intermediary work, from which it should follow that it does not belong among Aristotle's school treatises, and does not deserve serious study. For instance, in the following passage, he treats the *Generation of Animals* on a par with other physical works:⁴⁵

T6: In the treatises which follow he produces accounts of the particular [kinds of] things which come to be, in the *Meteorology* an account of meteorological phenomena, in *On the Generation of Animals* (περὶ τῆς τῶν ζώων γενέσεως) the coming-to-be of animals, and in a similar manner of the other things. (Philoponus, in *Gen. corr.* 124.24–27, tr. Williams (2001))

One may propose that Philoponus' commentary on *On Generation and Corruption* (and some other commentaries, such as that on the *De anima*, as I shall discuss below) was composed from notes taken in Ammonius' lectures, so this passage does not reflect Philoponus' own view. However, although the title in the manuscripts does suggest that it is an ἀπὸ φωνῆς commentary, Philoponus would also have made additions to, and (more importantly) added *criticisms* of, his teacher's lectures, as may be attested by the notion of ἐπιστάσεις in the title of the commentary.⁴⁶ Since there is no sign of criticism in this passage, it may be argued that this is Philoponus' own view, or a view of Ammonius shared by Philoponus. Therefore, we may conclude that if the *Generation of Animals* is an intermediary work, it does not follow that Philoponus did not conduct a proper study of it.

⁴⁰ See also *Proll.* 8.1–3, where Olympiodorus draws a sharp contrast between Aristotle's *Politics* and *Constitutions*.

⁴¹ For example, one may suppose that *On Generation and Corruption* discusses a variety of changes in a general way (in the first book), but also examines the change of elements specifically (in some chapters of the second book); cf. Philoponus, in *Gen. corr.* 6.30–33 Vitelli. Also, a part of the *De anima* may be devoted to the study of the general features of the soul, while other chapters deal with particular faculties of the soul, cf. Philoponus, in *De an.* 20.27–30.

⁴² One indication may be that, unlike Ammonius, Simplicius and Olympiodorus, Philoponus did not propose that one should put aside the particular and intermediary works, which can be viewed as an indication of these Neoplatonists' lack of interest in the particular and intermediary works; see Chase (2003) 99 n.53.

⁴³ On Philoponus' acquaintance with Galenic views, see especially Todd (1984); van der Eijk (2006) 1–4. See also Giardina and Gannagé (2012) 501–02 for a discussion on Philoponus' possible medical treatises. It is highly uncertain, however, whether the commentaries on a range of Galenic medical texts found in the Arabic tradition should be attributed to our Philoponus; see Giardina and Gannagé (2012) 556–63.

⁴⁴ Even if Philoponus' commentary on the *De anima* reflects Ammonius' views, as is claimed by, for example, Golitsis (2016) 397–401 and (2019), especially 167–68, it does not counter the suggestion that Philoponus himself was familiar with the *Generation of Animals*, whether or not this knowledge derived from his teacher (cf. Sorabji (2016) 385–86).

⁴⁵ I shall discuss another piece of textual evidence (T13) below, among other passages (Philoponus, in *De an.* 228.18, 286.15, 289.3–4).

⁴⁶ This view is proposed by Pantelis Golitsis, see Golitsis (2016) 401–06; Golitsis (2019) 168–76.

I have argued that there is no strong reason for scholars to conclude that all of Aristotle's biological works were regarded by the Neoplatonists as intermediary works, and that they may only have put the *History of Animals* into this category, considering it merely a documentary work. Further, although Philoponus did regard the *Generation of Animals* as an example of intermediary writing, this does not necessarily reflect the general Neoplatonic position, and does not suggest that Philoponus excluded the *Generation of Animals* from Aristotle's physical works. When I turn to the views of Neoplatonists on Aristotle's different physical writings in the next section, it will become clearer that they did regard most of Aristotle's biological works as a proper part of his natural philosophy, and thus his general, theoretical philosophical writings, rather than as intermediary works.

IV. Neoplatonists on the place of Aristotle's physical works

In this section, I shall focus first on Neoplatonic commentaries on Aristotle's physical works, and propose that there are many indications that these Neoplatonists regarded the study of animals as an inherent part of Aristotle's natural philosophy, so that these biological works belong among his general writings, and are worthy of serious study.⁴⁷ Then I shall argue that, according to the Neoplatonists, Aristotle's biological works make significant contributions to the discussion of certain intricate problems in Aristotle's theory of soul. Finally, although Proclus seems to be unsatisfied with Aristotle's biological research in his commentary on Plato's *Timaeus*, because Aristotle's biology has little to do with the intelligible beings and causes, this verdict does not imply that Proclus and other later Neoplatonists would have excluded the study of animals from Aristotle's natural philosophy. Instead, I shall suggest that Proclus is well-informed as to Aristotle's biological works and may have used these writings as a rich resource for his own philosophy.

i. Biology as a proper part of Aristotle's natural philosophy

First, I will present several passages in order to demonstrate how the Neoplatonists conceived of Aristotle's biological works in relation to his other physical works.

T7: Aristotle, then, wrote about things that belong to all natural things in common, namely in the work before us [the *Physics*]; about those that belong to eternal things in particular in the *De Caelo*; and about adjuncts that universally accompany all things involved in generation and corruption in the *De Generatione et Corruptione*, whereas in the *Meteorologica* and *On Mines* (that is the subject of the fourth book of the *Meteorologica*), in which he taught on matters that appertain to lifeless things, he wrote about those [adjuncts] that belong to atmospherical phenomena in particular. As for the corpus of works on animals and plants, some ... are about those [adjuncts] that accompany them as living and perceiving, i.e. all the treatises and investigations on animals (αἱ περὶ τῶν ζώων πᾶσαι πραγματεῖαι καὶ ἱστορίαι). Some adjuncts go with the animals as a whole, some with parts of them. The adjuncts that go with them as a whole are discussed in the work *On Animals* (Περὶ ζώων), those that go with their parts in the *De Partibus Animalium* and *De Motu Animalium*. Also *De Somno et Vigilantia*, *De Vita et Morte* and similar works relate to the study of animals, and furthermore the *De Anima*. Such is the sum total of Aristotle's works on nature. (Philoponus, in *Phys.* 1.23–2.13 Vitelli, tr. Osborne (2006))

⁴⁷ Cf. Hoffmann (2017) 163–64.

In this passage⁴⁸ Philoponus, perhaps reporting Ammonius' view, states explicitly that the *Parts of Animals* and the *Movement of Animals* are physical works, just like the *Physics*, *De caelo* and so forth, which belong to the general works according to the scheme of classification. It is worth mentioning that Philoponus also says that in the *History of Animals* Aristotle discusses the attributes of all animals together. However, I do not think the reference to the *History of Animals* implies that Philoponus (or Ammonius) put it on the same level as the *Parts of Animals*, the *Movement of Animals* and other more 'theoretical' biological works: it is possible that when he says elsewhere that αἱ περὶ τῶν ζώων πᾶσαι πραγματεῖαι καὶ ἱστορίαι (in *Phys.* 2.4–5), he is distinguishing the *History of Animals* (περὶ τῶν ζώων ἱστορία) from other biological works (περὶ τῶν ζώων πᾶσαι πραγματεῖαι). Simplicius may be saying something similar when he presents an overview of Aristotle's writings on nature in the preface to his commentary on the *Physics*:

T8: Now the subject of animals is discussed in all kinds of biological writings, in some cases reporting the facts (ἱστορικῶς), such as the *History of Animals* (ταῖς Περι ζώων ἱστορίαις), while some other works deal with the causes (αἰτιολογικῶς), such as the *Parts of Animals*, the *Generation of Animals*, the *Movement of Animals*, *On Sleep* and other such writings. (Simpl. in *Phys.* 3.6–9, my translation)

In this passage, Simplicius⁴⁹ distinguishes the *History of Animals* from other biological works, such as the *Parts of Animals*, *Generation of Animals* and the *Movement of Animals*. (As is noted by Hadot, at in *Phys.* 8.16–18, Simplicius explicitly excludes this kind of 'fact-reporting' work (τὰ ἱστορικὰ) from Aristotle's school treatises.)⁵⁰ More importantly, he also spells out the different features distinguishing these two kinds of biological works: while the *History of Animals* concerns the reporting of zoological facts (ἱστορικῶς), other biological writings deal with the causes (αἰτιολογικῶς).⁵¹ This observation contradicts Hadot's contention that in the Neoplatonists' view, Aristotle's biological treatises 'neglected research on causes', and thus belong to his intermediary works.⁵² As we have seen in extracts T1 and T3, these Neoplatonists thought that Aristotle's general works concern the nature or essence of things. Since the enquiry into causes can be considered an enquiry into the nature and essence of things, these biological works which deal with causes should rather be regarded as general works, according to Simplicius' verdict above.

In a similar vein, the biological writings were presented as an inherent part of Aristotle's natural philosophy in Neoplatonic commentaries on other physical works:

T9: After the meteorology the study of animals and plants remains ... We shall treat those subjects too, Aristotle says, 'in the manner already described' (κατὰ τὸν

⁴⁸ Cf. also Philoponus, in *Gen. corr.* 2.9–18; Simpl. in *Phys.* 2.8–3.12.

⁴⁹ One may object that this passage simply reflects the Peripatetic view on the classification of Aristotle's physical works (cf. in *Phys.* 3.10–13: ἡ μὲν οὖν διαίρεσις τοιαύτη τις ἐστὶ τοῦ φυσικοῦ τῆς φιλοσοφίας κατὰ τὴν περιπατητικὴν αἵρεσιν ὡς συνελόντι εἰπεῖν), which may not have been endorsed by Simplicius and other Neoplatonists. However, as I shall argue below, if Simplicius or other Neoplatonic commentators did not agree with a certain Peripatetic view, they criticized it, as Simplicius just had Alexander's interpretation of the place of the *De caelo* in a passage shortly preceding T8 (at in *Phys.* 2.16–25).

⁵⁰ Διχῆ δὲ διηρημένων αὐτοῦ τῶν συγγραμμάτων εἰς τε τὰ ἐξωτερικὰ οἷα τὰ ἱστορικὰ καὶ τὰ διαλογικὰ καὶ ὅλως τὰ μὴ ἄκρας ἀκριβείας φροντίζοντα καὶ εἰς τὰ ἀκροαματικά. See Hadot (2015) 137. But there is no indication that Simplicius also includes other biological works. Cf. also Olympiodorus, *Proll.* 11.13–19 for a similar contrast.

⁵¹ Cf. in *Phys.* 1191.6–7, where Simplicius claims that the *Movement of Animals* talks about 'the cause of locomotion' (τὴν αἰτίαν λέγει τῆς κατὰ τόπον κινήσεως); see also in *Phys.* 369.13–14 on the case of the *Parts of Animals* and T12 below.

⁵² Hadot (2015) 125.

ύφηγημένον τρόπον).⁵³ According to Alexander ‘the manner described’ means that in the preceding works he has not presented a mere study of the facts (μη ιστορίαν τινά παρέδωκεν), but in addition to this has offered specific evidence as to the causes of each of the facts (μετὰ τοῦ τὰς οικείας αἰτίας ἐκάστου) stated and investigated these things using demonstration (μετὰ ἀποδείξεως). His intention is, Alexander says, to conduct the discussion of the remaining subjects in the same way. In my opinion, however, by the ‘manner described’ Aristotle means the manner that he has described just before, the modest and philosophical way: ‘In some of these cases we merely raise the question, other points we touch to a certain extent’ ... He promises to deal with ‘animals and plants in general and separately’: general (κοινήν) study of animals is contained in his work *Description of Animals* (ἢ Περὶ ζῴων ιστορίας) and those *On Generation of Animals*, *On Parts of Animals*, their *Progression and Movement*, those *On Soul*, *On Perception and Perceptibles*, and *On Sleep and Waking*; those *On Memory and Recollection* and *On Foresight in Sleep* are separate and stand by themselves, since they apply to humans only. (Philoponus, in *Met.* 8.37–9.18 Hayduck, tr. Kupreeva (2011))

T10: Alexander thinks that ‘the manner already described’ (ύφηγημένον τρόπον) means the method of demonstration (τὸ ἀποδεικτικόν), which, however, I do not think is right. Rather, ‘the manner already described’ means discussing these matters universally and particularly (τὸ διαλεχθῆναι περὶ τούτων καὶ καθόλου καὶ ἰδία). For the discussion in the *Generation of Animals* (Περὶ ζῴων γενέσεως) is universal (καθόλου), while the discussion in the *History of Animals* (Περὶ ζῴων ιστορία) is particular (ἰδία). And furthermore, the discussion in *On Divination in Sleep* is particular, for he adopts this manner [of discussion] in [this subject] and on other [subjects]. And for each subject (σκοπῶ) he conducts the teaching both in a general way and in a particular way. So then, it is clear that this is the right interpretation, since he adds ‘in general and separately’ and explains this point. (Olympiodorus, in *Met.* 14.8–15 Stüve, my translation)

T11: [As Alexander would say,] ... he [i.e. Aristotle] wrote both about plants and animals, offering general (κοινήν) remarks regarding their generation, the differentiation and function of their parts, and their motion and activity, in texts such as *On the Motion of Animals* and *On Sleep and Waking*, making particular comments about each species of animal in *The History of Animals* (τὰ δὲ ἰδίως καθ’ ἕκαστον εἶδος τῶν ζῴων ἢ Περὶ ζῴων ιστορία παραδίδοσι).⁵⁴ (Simpl. in *Cael.* 3.4–8, tr. Hankinson (2002))

In these three passages, Simplicius, Philoponus and Olympiodorus mention that the *Parts of Animals*, *Generation of Animals* and *Movement of Animals* can be viewed as ‘general’ in some way, which is a good reason to argue that they considered these writings as among Aristotle’s general works. In addition, Simplicius in T11 not only once again makes a distinction between the *History of Animals* and other biological works (although for a different reason), but also asserts that the *History of Animals* is about ‘each species of animal’ (καθ’ ἕκαστον εἶδος τῶν ζῴων, 3.7–8). This judgement further confirms my ‘narrower’ reading of the term *historia*. Here one may wonder, since both Olympiodorus and Simplicius mention that the discussion in the *History of Animals* is particular, whether the *History of Animals* should be further ‘demoted’ to join Aristotle’s particular writings like the *Letters*. I think

⁵³ That is to say, Aristotle announces that he will conduct the study of animals and plants with the same method he has followed in earlier physical works. See Arist. *Met.* 1.1, 339a5–8.

⁵⁴ Hoffmann (2015) 43 n.72 emends the last sentence to τὰ δὲ ἰδίως <ὡς> καθ’ ἕκαστον εἶδος τῶν ζῴων ἢ Περὶ ζῴων ιστορία παραδίδοσι, constituting a parallelism with in *Cael.* 3.5 above (τὰ μὲν κοινῶς ὡς τὰ περὶ γενέσεως αὐτῶν καὶ περὶ μορίων), which may make more sense.

not. First, the *History of Animals* is clearly not addressed to a particular person, and these Neoplatonists would not have agreed that the *History of Animals* is dealing with individual animals like other particular writings, because, as Simplicius states explicitly in T2, this work is ‘about things which are not entirely particular’ (οὐ περὶ μερικῶν οὔσαι πάντα τινῶν, in *Cat.* 4.12–13). More importantly, what Olympiodorus and Simplicius emphasize in T10 and T11 is that *the manner of presentation* in the *History of Animals* can be seen as particular in some way. In other words, they seem to suggest that Aristotle discusses different aspects of animals separately in the *History of Animals*, rather than regarding the *objects of discussion* in the *History of Animals* as particular. But, as we have seen, according to this classification of Aristotle’s writings, the way to determine whether a text is a particular or a general work is to consider whether the objects of discussion can be regarded as particular or general in some way, rather than whether the manner of presentation is general.

Hadot claims that in all these passages the commentators are following Alexander of Aphrodisias’ view somewhat ‘blindly’, not realizing that it contradicts their view in the commentaries on the *Categories*: that all biological works should be placed in the category of intermediary works.⁵⁵ Certainly, these commentators make much use of Alexander’s commentary in these passages. However, I want to stress that they are engaging with Alexander ‘critically’, rather than endorsing his exegeses without due consideration.⁵⁶ In other words, I would argue that if they disagreed with Alexander’s view on a certain point, they would have refuted it and proposed their own alternatives.

For example, Simplicius later criticizes Alexander’s assertion that the *De caelo* ‘concerns the whole world and all of the simple bodies’ (in *Cael.* 3.14–27). In T9 and T10, both Philoponus and Olympiodorus challenge Alexander’s interpretation of the phrase ‘the manner already described’. According to Alexander, it should be understood to mean using demonstration and identifying the cause. However, for Philoponus, ‘this manner’ indicates a kind of ‘aporetic’ method: when we are unable to grasp the truth completely, we may be content with simply raising the question, or just ‘touch[ing upon it] to a certain extent’. According to Olympiodorus, ‘this manner’ simply means that one should investigate objects both in a general and in a particular way.

It should also be noted that the refutation of Alexander’s interpretation of ‘this manner’ of studying animals and plants does not necessarily mean that for Philoponus and Olympiodorus, *all* of Aristotle’s biological works do not concern the causes. Besides the explanations they give in the commentaries, another motivation behind their critical engagement with Alexander may be the following: we note that both (perhaps following Alexander) include the *History of Animals* as a study on animals. Given that these Neoplatonists may have considered the *History of Animals* only a documentary work, one that does not talk about the causes, they take it to be different from the other biological works. For this reason, they needed to seek another explanation of ‘this manner’ that was applicable to all Aristotle’s biological writings.

As for the position of regarding the biological works as a subgroup of the physical works, it seems clear that here these commentators do not take issue with Alexander. It is unlikely that Philoponus and Olympiodorus would ‘forget’ to correct Alexander, since they had just challenged him on the interpretation of ‘the manner already described’ in the same lemma (Arist. *Mete.* 1.1, 339a5–8). Moreover, if their disagreement with Alexander was related to the issue of the *History of Animals*, as I have suggested, then it is far less plausible that they merely followed Alexander in regarding all the biological works as

⁵⁵ Hadot (1990) 85, 90. Cf. Chase (2003) 100 n.59; Hoffmann (2017) 161.

⁵⁶ See Kupreeva (2011), especially 1–3, for Philoponus’ commentary on the *Meteorology*. See also Hankinson (2002) 6–7; Baltussen (2008) 129–31, 188–93; Hoffmann (2015) 32–33, 43–44, 47–48 for Simplicius’ critical engagement with Alexander in his commentary on the *De caelo*.

proper physical treatises. Therefore, it can be postulated that on this issue, they accepted Alexander's opinion after serious and 'critical' engagement, realizing that this view did not contradict their own as stated elsewhere.

ii. Aristotle's biological works and the Neoplatonic discussion on the soul

The *Parts of Animals* and the *Generation of Animals* are important for some hotly debated issues concerning the *De anima* in Neoplatonism.⁵⁷ I shall mention two examples below. The first is whether Aristotle's theory of soul should belong to natural philosophy or first philosophy. The second issue is about the separability of some parts of soul from the body.⁵⁸ When Neoplatonic commentators considered these two problems, they often made reference to the discussions in the *Parts of Animals* or the *Generation of Animals*:

T12: But first let us consider whether the study of soul belongs to natural or to the higher philosophy (τῆ ὑπερτέρῃ) ... since Aristotle does not merely report (ἀποφάνεται) on the results of his investigation of this matter, but also demonstrates (δείκνυσιν) them, adding their grounds (τὰς αἰτίας προστιθεῖς), in Book 1 of *On the Parts of Animals* [*Part. an.* 1.1, 641a17–b10], we must insert and examine what is said there ... In that passage it is determined that something in the soul is studied by natural philosophy—those elements that are a form of animality marking off animals as animals ... and that concerned with growth and sensation, and that which is the cause of change of place. But whatever is intellective is the province of first philosophy. (Ps.-Simpl. in *De an.* 1.24–2.33, tr. Urmson (1995))

T13: [T]hat Aristotle, too, ... is aware that the one soul is separable, whereas the other is inseparable, can be shown clearly on the basis of many passages; at any rate at the end of the treatise *On the Parts of Animals*,⁵⁹ which immediately precedes the present treatise [i.e. *De anima*], he says that each of the parts of the animals is characterized by a specific vital activity ... And [there is the question], he says, whether the student of nature is to discuss the whole soul or not the whole soul but only that which is not without matter. Therefore, he is aware that soul is separable from matter. For if the student of nature is to speak about the whole soul, he says, it is clear that he will also speak about the intellect; but if he is also to speak about the intellect, he will of necessity also speak about the intelligible objects ... But to discuss the intelligible objects is the task of the first philosopher. It will therefore follow from this that the student of nature will cover all things, which is absurd ... And in this very treatise *On the Parts of Animals*⁶⁰ he says: 'It seems that the intellect enters from

⁵⁷ Of course, Aristotle's biological works do not only contribute to the discussion of soul in Neoplatonism. Cf. Cerami and Falcon (2014) 44–45 for another example at Simpl. in *Cael.* 398.15–24. The reason why I focus on the case of the *De anima* is that the Neoplatonists may have regarded the study of the soul as a 'transition' towards the study of first principles (see Ps.-Simpl. in *De an.* 3.4–6 Hayduck; Olympiodorus, in *Met.* 4.5–15). In this sense, biological investigations are not so far removed from the intelligible world. Also, it is in the commentaries on the *De anima* that these commentators refer to the biological works most frequently. Olympiodorus even regarded Aristotle's biological works as treatises concerned mainly with the soul at in *Met.* 4.1–5; see Wilberding (2017) 3.

⁵⁸ For a general discussion of these two issues in the Neoplatonists, see Blumenthal (1996) 74–81.

⁵⁹ As is noted by van der Eijk (2005) 121 n.125, this reference is actually to *Parts of Animals* 1.1, 641a17–b10, rather than the end.

⁶⁰ This passage is actually *Generation of Animals* 2.3, 736b27–29; see van der Eijk (2005) 121 n.131. However, contra Wilberding (2017) 9 n.24, I do not think these incorrect references imply that Philoponus and other Neoplatonists did not have direct access to Aristotle's biological works. The reason is rather that these commentaries were mainly derived from lectures, where the speaker may have quoted from memory, and Philoponus had not had the opportunity to revise the text for a (possible) final publication; cf. Westerink (1962) x. Moreover, there

outside and is divine; for its activity has nothing in common with the activities of the body.' ... therefore, he knows soul to be separable from matter. (Philoponus, in *De an.* 10.8–31 Hayduck, tr. van der Eijk (2005))

In T12,⁶¹ Ps.-Simplicius⁶² mentions the problem of whether the study of soul belongs to natural philosophy or first philosophy,⁶³ which can be seen as related to the level of first principles. In order to examine this problem, he refers to *Parts of Animals* 1.1, 641a17–b10 to support his answer. More importantly, the commentator suggests that Aristotle does not merely 'report' or display (ἀποφαίνεται), but 'demonstrate' (δείκνυσθαι) with causes the results of his investigation in the *Parts of Animals*.⁶⁴ The use of 'demonstration' here may suggest that the commentator views what Aristotle did in the *Parts of Animals* as a proper philosophical examination, rather than a text engaging in simple documentary activities, such as collecting and reporting the constitutions of *poleis* in the case of the *Constitutions*.

Similarly, in T13,⁶⁵ Philoponus (perhaps following Ammonius)⁶⁶ relates these two issues to each other, and also makes much use of passages from the *Parts of Animals* and the *Generation of Animals* (although he gives an incorrect reference in the latter case). As I have argued above, the fact that Philoponus regarded the *Generation of Animals* as an intermediary work does not imply that he would dismiss it in his study of Aristotle's natural philosophy. Moreover, Philoponus points out that the *Parts of Animals* (at least the first book)⁶⁷ should be put before the *De anima* (in *De an.* 10.12). This attribution of the *Parts of Animals* to Aristotle's natural philosophy reaffirms my proposal that his biological works, with the exception of the *History of Animals*, belong to the general physical works, rather than the intermediary writings. And the fact that the *Parts of Animals* may be positioned before the *De anima* also undermines the idea that the *Physics*, *De caelo*, *On Generation and Corruption*, *Meteorology* and *De anima* (in that order) form the complete cycle of Aristotle's physical works.⁶⁸

Above all, the doctrines of the *Parts of Animals* and the *Generation of Animals* constitute a substantial part of these commentators' discussion of some difficult issues in Aristotle's natural philosophy. The discussions in these biological works can be cited and utilized in an 'argumentative' way, to support their own views, when dealing with relevant

are some incorrect references to Plato's dialogues in Neoplatonic commentaries on Aristotle, and no one would suggest that these commentators did not have direct access to Plato.

⁶¹ See also Ps.-Simpl. in *De an.* 8.2; 242.3, where he makes the same point.

⁶² I agree that this commentary on the *De anima* is not Simplicius' own work, but I am not totally sure that 'Ps.-Simplicius' must be Priscian; cf. Wilberding (2018) 489–90.

⁶³ See Bydén (2018) 13–15 for a discussion of this issue.

⁶⁴ Cf. also Simpl. in *Cael.* 398.20 and 403.14 on the case of the *Movement of Animals*. The same distinction between the *History of Animals* and other biological works can also be found in Philoponus' commentary on the *De anima*: ὡς δείξει ἐν τοῖς Περὶ γενέσεως ζώων (in *De an.* 286.15); ἰστορεῖ γὰρ Ἀριστοτέλης ἐν τῇ Περὶ ζώων ἰστορίᾳ (in *De an.* 268.1).

⁶⁵ See Philoponus, in *De an.* 25.13, 55.12, 261.28 for the same discussion of the first problem.

⁶⁶ For instance, Papachristou (2019) 151–52 and Golitsis (2019) think that this passage may be taken from Ammonius' lectures on the *De anima*, while van der Eijk (2005) 1 considers it an exposition of Philoponus' own ideas. At any rate, I see no reason why Philoponus would deny this point when he composed these lines, even if he was simply reporting his teacher's view.

⁶⁷ Cf. van der Eijk (2005) 121 n.126; Papachristou (2019) 151 n.3; Bydén (2018) 13 n.40 for further discussion.

⁶⁸ Cf. Hadot (2015) 125. According to some cross-references in Aristotle's treatises, the *De anima* (and the *Parva naturalia*) may have been conceived as part of Aristotle's zoological writings; for further discussion see, for example, Jaeger (1913) 38–42; Falcon (2017) 219–24. This is also reflected in the organization of the early printed editions of Aristotle; see Falcon (2021a) 24–29 on this topic.

problems.⁶⁹ And this stands in contrast to these commentators' attitudes towards the *History of Animals*. Although they sometimes referred to the latter in their commentaries, these references only aimed to provide some kind of 'background information', and do not form an integral part of the Neoplatonic philosophical exegeses.⁷⁰

iii. Proclus' appraisal of Aristotle's biological investigations in his commentary on the *Timaeus*

As mentioned above, according to Hadot, the main reason why the Neoplatonic commentators considered Aristotle's study of animals to be merely intermediary is that they thought that the biological enquiries were based on sensible particulars, without reference to the intelligible beings and general causes. In order to strengthen this contention, Hadot also points to Proclus' verdicts on Aristotle's natural philosophy in the preface to his commentary on Plato's *Timaeus*:

T14: It seems to me that the incredible Aristotle (ὁ δαιμόνιος Ἀριστοτέλης) was also pursuing Plato's teaching to the best of his ability when he arranged his whole treatment of physics like this. (i) He saw there were common factors in all things that have come to exist by nature: form, substrate, the original source of motion, motion, time and place—things which Plato too has taught about here ... (ii) The first of these were what belonged to the heaven—in agreement with Plato insofar as he made the heaven ungenerated and composed of the fifth essence ... (iii) The second were what was common to all the realm of coming to be, an area where one can admire Plato for the great detail in which he studied both their real natures and their properties, correctly preserving both their harmony and their polarities. (iv) As for what concerns coming to be, part belongs to things in the skies, whose principles Plato has accounted for, while Aristotle has extended their teaching beyond what was called for (τὴν διδασκαλίαν ἐξέτεινε πέρα τοῦ δέοντος);⁷¹ (v) but part extends to the study of animals, something which Plato has given a detailed explanation of with regard to all their causes, including the final causes and the supplementary requirements (τὰς τελικὰς καὶ τὰς συναϊτίους), while in Aristotle's work they have only with difficulty and in a few cases been studied in relation to form (ἐν ὀλίγοις κατὰ τὸ εἶδος τεθεώρηται). For in most cases he stops at the point of matter (τὰ πολλὰ γὰρ ἄχρι τῆς ὕλης ἴσταται), and by pinning his explanations of physical things on this he demonstrates to us just how far he falls short of the teaching of his master.⁷² (Procl. *in Ti.* I 6.21–7.16 Diehl, tr. Tarrant (2007), numbering added)

⁶⁹ One anonymous referee pointed out to me that when Alexander of Aphrodisias proposed that Aristotle's *De anima* was a proper part of natural philosophy, he 'consciously' did not invoke the passage at *Parts of Animals* 1.1, 641a17–b10; see also Falcon (2021b) 253. In contrast, we have seen that the Neoplatonists referred to this passage when they debated the place of the study of the soul. This, in my view, is a further indication that these Neoplatonists engaged in a proper study of Aristotle's biological works, and also 'consciously' utilized them in their philosophical discussion, as well as in their critical engagement with Alexander.

⁷⁰ See, for example, Ammon. *in Cat.* 71.21; Simpl. *in Cat.* 318.34; Philoponus, *in Cat.* 112.15; Philoponus, *in De an.* 268.1.

⁷¹ It should be noted that this sentence does not suggest that Aristotle extended the *scope* of natural philosophy beyond what was called for, because Proclus states explicitly that both Plato and Aristotle are dealing with meteorological phenomena. Similarly, in the case of biology, Proclus does not say that Aristotle extended the scope of Plato's teaching of nature beyond what was needed; instead, what dissatisfies Proclus is the fact that Aristotle, in his view, did not pay due attention to the final cause and the form in respect to the animals.

⁷² For the labelling, see also Festugière (1966) 30–31 n.1.

According to Hadot, in this passage Proclus attributes some value to Aristotle's *Physics*, *De caelo* and *On Generation and Corruption*, but is rather unsatisfied with the *Meteorology*; and, particularly, Proclus disparages Aristotle's biological works, which in his view seldom go beyond the discussion of matter. Hadot argues that later Neoplatonic commentators following Proclus would also have had the same attitude towards Aristotle's biological writings, which constitutes a good reason for them to exclude these works from Aristotle's physical works and school treatises.⁷³ However, as is argued by Carlos Steel,⁷⁴ Proclus also has little respect for Aristotle's other physical works. He seems to praise Plato 'for the great detail in which he studied both the real natures of the objects of study and their properties, correctly preserving both their harmony and their polarities', without any mention of Aristotle's similar discussions in the *On Generation and Corruption*. In contrast to his discussion of the *Physics* and *De caelo*, where he explicitly mentions Aristotle's doctrine, which is in agreement with Plato, Proclus' silence in the case of the *On Generation and Corruption* presumably suggests that he also thinks Aristotle's theories therein are inferior to Plato's treatment.⁷⁵ However, this verdict does not prevent later Neoplatonists from including the *Generation and Corruption* among Aristotle's physical works, or from writing commentaries on it. Therefore, Proclus' attitude towards some of Aristotle's physical works, which proceed through observation of sensible particulars and have little relation to intelligible beings and causes, does not mean that all Neoplatonists felt they should be excluded from his natural philosophy and did not deserve study.

That being said, one may object that since the scope of the Neoplatonic study of nature is delimited by the *Timaeus*, in which biology appears merely as an 'afterthought' (*Ti.* 90e1–4, cf. 27a5–6), the study of the living being is not a proper part of natural philosophy for these Neoplatonists. However, I think it is one thing to say that 'biology does not play a significant role in the *Timaeus*' and another thing entirely to say that 'biology is excluded from natural philosophy in the Neoplatonic tradition'. What I am arguing against in this paper is the latter claim. I will provide two further pieces of evidence that the study of living beings was indeed a proper part of natural philosophy for the Neoplatonists, with reference to the Neoplatonic interpretation of the *Timaeus*.

First, Proclus proposes in his commentary on the *Timaeus* that the Platonic philosopher of nature (τῷ φυσικῷ), who may also be a theologian to some extent,⁷⁶ needs also to be concerned with 'the living being' (περὶ τοῦ ζώου) and 'the life of the body' (περὶ τῆς τοῦ σώματος ζωῆς) (*in Ti.* III 353.13–22).⁷⁷ He further clarifies this point as follows: 'one must speak (ῥητέον) here about the body bit by bit (κατὰ μέρος), for instance about head, about chest, about legs; and about each of these parts within them given that these too are "organic" (ὀργανικά)' (*in Ti.* III 354.28–355.2, tr. Tarrant (2017)), since the human being, as a living being, can be viewed as 'a cosmos on a small scale' (μικρὸς κόσμος, *in Ti.* III 355.9). This passage shows explicitly that Proclus did not disregard the study of biology. Even if we grant that he did not comment on the relevant part of the *Timaeus*,⁷⁸ we cannot exclude the possibility that some oral teachings may have been given on these topics within the school.

Second, in the preface to his commentary on the *De caelo*, Simplicius compares Plato's *Timaeus* with Aristotle's physical corpus, arguing that Plato discussed natural philosophy as a whole in that single dialogue, whereas Aristotle addressed natural philosophy across

⁷³ See Hadot (1990) 89; Hadot (1991) 180; Hadot (2015) 123–25; cf. Hoffmann (2017) 166–67; Falcon (2021b) 254–55.

⁷⁴ Steel (2003) 176–77.

⁷⁵ It is also observed by Festugière (1966) 30–31 n.1. Pace Hadot (1991) 180.

⁷⁶ See Martijn (2010) 6–10 and Steel (2003) 177 on the relation between natural philosophy and theology in Proclus' commentary on the *Timaeus*.

⁷⁷ See also Martijn (2010) 212, 297.

⁷⁸ See Tarrant (2017) 1–7, but cf. Luna et al. (2012) 1576 and Perkams (2018) 1917 for a contrasting view.

his different physical writings (Simpl. in *Cael.* 3.17–22, 3.25–27). Importantly, according to Simplicius, discussion of the living being does constitute a part of Plato's natural philosophy:

T15: He [i.e. Plato in his *Timaeus*] treated both of the principles of natural objects, ... and of the general composition of the world, and gave a particular account both of the heavenly bodies and of those below the moon, in the latter case occupying himself both with atmospheric phenomena and with the minerals, *plants, and animals on the earth up to and including the composition of man and of his parts.*⁷⁹ (Simpl. in *Cael.* 3.17–22, tr. Hankinson (2002), my emphasis)

For Simplicius, just as the study of living beings is an integral part of Plato's *Timaeus*, so biology constitutes a proper part of Aristotle's natural philosophy. Therefore, if the *Timaeus* established the scope of the Neoplatonic study of nature, biology lies within it.⁸⁰

Finally, there is some further evidence that Proclus himself may also have some knowledge of Aristotle's biological theories, although he seems to dismiss them in T14. For example, in his commentary on the *Timaeus*, Proclus probably makes a reference to Aristotle's discussion of spontaneous generation at *Generation of Animals* 3.11, 762a18–21, when he proposes that the earth may generate living beings:

T16: And finally there is this visible mass that is everywhere inspired and filled with life from the soul's vehicle. [This filling with life, in turn] results in the Earth engendering and nourishing various living things, some of whom are planted in it, while others are moved about it. Seeing this fact, even Aristotle had qualms about not giving the Earth a physical life.⁸¹ (Procl. in *Ti.* III 135.20–25, tr. Baltzly (2013))

Moreover, in another passage, Proclus shows himself well-informed as to Aristotle's doctrine of the cycles of living beings at *Generation of Animals* 4.9, 777b16–30,⁸² and he is generally in agreement with Aristotle on this point (in *Ti.* III 54.33–34).⁸³ For present purposes, it may suffice to say that these two passages, together with the references to Aristotle's *Generation of Animals* (which are *not* easily recognizable even for modern scholars), indicate that Proclus is quite familiar with Aristotle's biological writings, which must be a result of proper study of these works.⁸⁴ Therefore, according to Proclus and other later Neoplatonists, although Aristotle's study of animals seems to be far detached from the Neoplatonic intelligible world and is much inferior to Plato's, this judgement did not cause them to exclude Aristotle's biology from his natural or theoretical philosophy.

⁷⁹ See Hoffmann (2015) 32–33 for further discussion of this issue.

⁸⁰ I remain most grateful to the anonymous referee who pressed me to address this issue.

⁸¹ This is a reference to *Generation of Animals* 3.11, 762a18–21, as is correctly identified by Steel (2009) 266. It is remarkable that neither Festugière nor Baltzly identified the proper reference in their translations (the reference to *De mundo* 391b13–14 is plausible, but the *Generation of Animals* may be a better option, especially as Proclus doubts the authorship of *De mundo*; see Baltzly (2013) 232 n.556). This may indicate the extent of Proclus' mastery of Aristotle's biological works.

⁸² Similarly, Diehl fails to recognize the right passage, which is corrected by Festugière (1968) 77 n.1; see also Baltzly (2013) 115 n.211.

⁸³ But cf. Wilberding (2015) 339–40, according to whom Proclus may take issue with Aristotle's explanation of some cycles of life, such as the relation between the phases of the moon and the cycle of menstrual fluid.

⁸⁴ Proclus may have read Aristotle's biological writings specifically for material that was relevant to his own concerns, while passing over other doctrines. But this 'selective' approach hardly invalidates his overall familiarity with the biological works.

V. Conclusion

In this paper, I have endeavoured to establish the proper place of Aristotle's biological enquiries within his natural philosophy. I have argued that there is no convincing reason to think that the Neoplatonists regarded all of Aristotle's extant biological writings as intermediary works. They might have excluded the *History of Animals* from Aristotle's school treatises, as an exception to the rule. They held that most of Aristotle's biological works deserved serious examination, and should be included in their school curricula. Although it is somewhat surprising that the Neoplatonists never composed any commentaries on Aristotle's biological works, there are other alternative explanations. Neither the Peripatetics nor the physicians like Galen wrote any commentaries on Aristotle's biology in antiquity, so perhaps the reason is not particular to Neoplatonism.⁸⁵ And my conclusion confirms the proposal that the Neoplatonists were also interested in the study of biology,⁸⁶ which has become a more prevalent view in recent scholarship.⁸⁷ Moreover, as I have shown in the case of the *De anima*, according to some Neoplatonists, Aristotle's *Parts of Animals* and *Generation of Animals* offer important contributions to the examination of certain crucial problems of natural philosophy and first philosophy in Neoplatonism. In this regard, the study of biology may ultimately be helpful to the discussion of intelligible beings.

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Bibliography

- Balme, D. (1991) *Aristotle: History of Animals, Volume III: Books 7–10* (Cambridge MA)
- Baltussen, H. (2008) *Philosophy and Exegesis in Simplicius* (London)
- Baltzly, D. (2013) *Proclus: Commentary on Plato's Timaeus: Volume 5, Book 4* (New York)
- Blumenthal, H.J. (1996) *Aristotle and Neoplatonism in Late Antiquity: Interpretations of the De anima* (Ithaca)
- Bolton, R. (2009) 'Two standards for inquiry in Aristotle's *De caelo*', in A.C. Bowen and C. Wildberg (eds), *New Perspectives on Aristotle's De caelo* (Leiden) 51–82
- Bydén, B. (2018) 'Introduction: the study and reception of Aristotle's *Parva naturalia*', in B. Bydén and F. Radovic (eds), *The Parva naturalia in Greek, Arabic and Latin Aristotelianism* (New York) 1–50
- Cerami, C. and Falcon, A. (2014) 'Continuity and discontinuity in the Greek and Arabic reception of Aristotle's study of animals', *AntPhilos* 8, 35–56
- Chase, M. (2003) *Simplicius: On Aristotle Categories 1–4* (Ithaca)
- Cohen, S.M. and Matthews, G.B. (1991) *Ammonius: On Aristotle Categories* (Ithaca)
- Düring, I. (1957) *Aristotle in the Ancient Biographical Tradition* (Götheborg)
- Falcon, A. (2017) 'The place of the *De motu animalium* in Aristotle's natural philosophy', in W. Wians and R. Polansky (eds), *Reading Aristotle: Argument and Exposition* (Leiden) 215–35
- (2021a) 'The reception of the *De incessu animalium*', in A. Falcon and S. Stavrianeas (eds), *Aristotle on How Animals Move: The De incessu animalium: Text, Translation, and Interpretative Essays* (Cambridge) 19–31
- (2021b) 'The reception of Aristotle's biology in late antiquity and beyond', in S. Connell (ed.), *The Cambridge Companion to Aristotle's Biology* (Cambridge) 246–60

⁸⁵ Cf. Lennox (1994) for some possible suggestions. Cf. also Falcon (2021b) for a general assessment. An exception may be Nicolaus of Damascus, who includes Aristotle's study of animals in his compendium of Aristotle's philosophy; see Cerami and Falcon (2014) 42–43; Hatzimichali (2021) 233.

⁸⁶ A further piece of evidence is that in their introductions to philosophy, Elias and David both think the study of 'bones, hair, finger nails and trees'—which one would naturally consider biological studies—belongs to natural philosophy, a part of theoretical philosophy (Elias, in *Porph.* 27.37 Busse; David, *Proll.* 58.4 Busse).

⁸⁷ Notably Wilberding (2014; 2015; 2017), among others.

- Falcon, A. and Leunissen, M. (2015) 'The scientific role of *eulogos* in Aristotle's *Cael* II 12', in D. Ebrey (ed.), *Theory and Practice in Aristotle's Natural Science* (Cambridge) 217–40
- Festugière, A.-J. (1966) *Proclus: commentaires sur le Timée. Tome 1, Livre I* (Paris)
- (1968) *Proclus: commentaires sur le Timée. Tome 4, Livre IV* (Paris)
- Freeland, C. (1990) 'Scientific explanation and empirical data in Aristotle's *Meteorology*', *OSAPh* 8, 67–102
- Gertz, S. (2018) *Elias and David: Introductions to Philosophy with Olympiodorus: Introduction to Logic* (London)
- Giardina, G.R. and Gannagé, E. (2012) 'Jean Philopon', in R. Goulet (ed.), *Dictionnaire des philosophes antiques Va: de Paccius à Plotin* (Paris) 455–563
- Golitsis, P. (2016) 'John Philoponus' commentary on the third book of Aristotle's *De anima*, wrongly attributed to Stephanus', in R. Sorabji (ed.), *Aristotle Re-Interpreted: New Findings on Seven Hundred Years of the Ancient Commentators* (London) 393–412
- (2019) 'μετά τινων ιδίων ἐπιστάσεων: John Philoponus as an editor of Ammonius' lectures', in P. Golitsis and K. Ierodiakonou (eds), *Aristotle and His Commentators* (Berlin and Boston) 167–93
- Gotthelf, A. (2012) 'Data-organization, classification, and kinds: the place of the *History of Animals* in Aristotle's biological enterprise', in A. Gotthelf, *Teleology, First Principles, and Scientific Method in Aristotle's Biology* (New York) 261–92
- Hadot, I. (1990) *Simplicius: commentaire sur les Catégories, Fasc. I: introduction, première partie (p. 1–9,3 Kalbfleisch)* (Leiden)
- (1991) 'The role of the commentaries on Aristotle in the teaching of philosophy according to the prefaces of the Neoplatonist commentaries on the Categories', in H. Blumenthal and H. Robinson (eds), *Aristotle and the Later Tradition*, *OSAPh*, *supp.*, 175–89
- (2015) *Athenian and Alexandrian Neoplatonism and the Harmonization of Aristotle*, tr. M. Chase (Leiden)
- Hankinson, R.J. (2002) *Simplicius: On Aristotle On the Heavens 1.1–4* (London)
- Hatzimichali, M. (2021) 'The early reception of Aristotle's biology', in S. Connell (ed.), *The Cambridge Companion to Aristotle's Biology* (Cambridge) 228–45
- Hellmann, O. (2006) 'Peripatetic biology and the *Epitome* of Aristophanes of Byzantium', in W.W. Fortenbaugh and S.A. White (eds), *Aristo of Ceos: Text, Translation, and Discussion* (New Brunswick and London) 329–59
- Hoffmann, P. (2015) 'Le σκοπός du traité aristotélicien *Du ciel* selon Simplicius: exégèse, dialectique, théologie', *Studia graeco-arabica* 5, 27–51
- (2017) 'I trattati di storia naturale e la zoologia nella classificazione neoplatonica degli scritti di Aristotele tra il V e il VI secolo d.C.', in M.M. Sassi, E. Coda and G. Feola (eds), *La zoologia di Aristotele e la sua ricezione dall'età ellenistica e romana alle culture medievali* (Pisa) 145–69
- Jaeger, W. (1913) 'Das pneuma im Lykeion', *Hermes* 48, 29–74
- Karamanolis, G. (2006) *Plato and Aristotle in Agreement? Platonists on Aristotle from Antiochus to Porphyry* (New York)
- Kupreeva, I. (2011) *Philoponus: On Aristotle Meteorology 1.1–3* (London)
- Lennox, J. (1991) 'Between data and demonstration: the *Analytics* and the *Historia animalium*', in A.C. Bowen (ed.), *Science and Philosophy in Classical Greece* (New York and London) 261–94
- (1994) 'The disappearance of Aristotle's biology: a Hellenistic mystery', *Apeiron* 27.4, 7–24
- (2001) *Aristotle: On the Parts of Animals* (New York)
- Luna, C., Segonds, A.-P. and Endress, G. (2012) 'Proclus de Lycie', in R. Goulet (ed.), *Dictionnaire des philosophes antiques Vb: de Plotina à Rutilius Rufus* (Paris) 1546–1674
- Martijn, M. (2010) *Proclus on Nature: Philosophy of Nature and Its Methods in Proclus' Commentary on Plato's Timaeus* (Leiden)
- Moraux, P. (1973) *Aristotelismus bei den Griechen Band 1* (Berlin and New York)
- Osborne, C. (2006) *Philoponus: On Aristotle Physics 1.1–3* (London)
- Papachristou, I. (2019) 'Ammonius Hermeiou on the appearances of ghosts', in P. Golitsis and K. Ierodiakonou (eds), *Aristotle and His Commentators* (Berlin and Boston) 151–65
- Perkams, M. (2018) 'Proklos', in C. Riedweg, C. Horn and D. Wyrwa (eds), *Die Philosophie der Antike 5.3: Philosophie der Kaiserzeit und der Spätantike* (Basel) 1909–71
- Sharples, R.W. (1995) *Theophrastus of Eresus: Sources for His Life, Writings, Thought and Influence. Commentary 5: Sources on Biology* (Leiden)
- Sirkel, R., Tweedale, M., Harris, J. and King, D. (2015) *Philoponus: On Aristotle Categories 1–5 with Philoponus: A Treatise Concerning the Whole and the Parts* (London)
- Sorabji, R. (2014) 'The Alexandrian classrooms excavated and sixth-century philosophy teaching', in P. Remes and S. Slaveva-Griffin (eds), *The Routledge Handbook of Neoplatonism* (London and New York) 30–39
- (2016) 'Dating of Philoponus' commentaries on Aristotle and of his divergence from his teacher Ammonius', in R. Sorabji (ed.), *Aristotle Re-Interpreted: New Findings on Seven Hundred Years of the Ancient Commentators* (London) 367–92

- Steel, C. (2003) 'Why should we prefer Plato's *Timaeus* to Aristotle's *Physics*? Proclus' critique of Aristotle's causal explanation of the physical world', in R.W. Sharples and A. Sheppard (eds), *Ancient Approaches to Plato's Timaeus* (BICS Supplement 78) (London) 175–87
- (2009) 'The divine earth: Proclus on *Timaeus* 40 BC', in R. Chiaradonna and F. Trabatttoni (eds), *Physics and Philosophy of Nature in Greek Neoplatonism* (Leiden) 259–81
- Tarrant, H. (2007) *Proclus: Commentary on Plato's Timaeus: Volume 1, Book 1* (New York)
- (2017) *Proclus: Commentary on Plato's Timaeus: Volume 6, Book 5* (Cambridge)
- Todd, R.B. (1984) 'Philosophy and medicine in John Philoponus' commentary on Aristotle's *De anima*', *DOP* 38, 103–10
- Trizion, M. (2018) 'The Byzantine reception of Aristotle's *Parva naturalia* (and the zoological works) in eleventh- and twelfth-century Byzantium: an overview', in B. Bydén and F. Radovic (eds), *The Parva naturalia in Greek, Arabic and Latin Aristotelianism* (New York) 155–68
- Urmson, J.O. (1995) *'Simplicius': On Aristotle On the Soul 1.1–2.4* (London)
- van der Eijk, P. J. (2005) *Philoponus: On Aristotle On the Soul 1.1–2* (London)
- (2006) *Philoponus: On Aristotle On the Soul 1.3–5* (London)
- Westerink, L.G. (1962) *Anonymous Prolegomena to Platonic Philosophy* (Amsterdam)
- Wilberding, J. (2014) 'Neoplatonism and medicine', in P. Remes and S. Slaveva-Griffin (eds), *The Routledge Handbook of Neoplatonism* (London and New York) 356–71
- (2015) 'The revolutionary embryology of the Neoplatonists', *OSAPh* 49, 321–61
- (2017) *Forms, Souls, and Embryos: Neoplatonists on Human Reproduction* (New York)
- (2018) 'Late antiquity', *Phronesis* 63.4, 477–90
- Williams, C.J.F. (2001) *Philoponus: On Aristotle On Coming-to-Be and Perishing 1.6–2.4* (London)
- Wilson, M. (2013) *Structure and Method in Aristotle's Meteorologica* (New York)