

Aristotle's De anima and the Study of Perishable Living Beings

I The Study of Living Beings Before Aristotle and Theophrastus

Aristotle and Theophrastus were engaged in a systematic study of living beings aimed at scientific knowledge. In this chapter I argue that the theoretical foundation for their articulation of this study into two main parts, animals and plants, is to be found in the results that Aristotle reached in his own research into the soul. This research was itself a remarkable innovation. While the ancient philosophical reflection on the soul started well before Aristotle, it never took the form of a systematic investigation concerned with the soul as the principle of living beings. The ultimate reason for this innovation is to be found in Aristotle's interest in life – not an interest in this or that form of life but an unrestricted interest in all forms and manifestations of life. This interest caused him to engage in an unrestricted study of the soul as the ultimate principle or source of life. Tellingly, Aristotle criticizes his predecessors for having approached the soul by focusing exclusively on the human soul.¹ Aristotle names no names, but his most immediate and obvious critical target is Plato and his account of the soul in dialogues such as the *Phaedo* (also known in antiquity as *On the Soul*), *Republic*, and *Phaedrus*.² For Aristotle, Plato's almost exclusive focus on the human soul was not only arbitrary but also a non-starter. A question that is at the heart of this chapter is how the completely unrestricted study of the soul envisioned at the outset of Aristotle's *De anima* is subsequently narrowed down to the study of the soul as a principle of *perishable living beings*. Without a clear grasp of how this transition is negotiated, it is difficult to understand how Aristotle can justify his second

¹ Aristotle, *DA* I 1, 402b3–5.

² In Plato's *Timaeus* the focus is no longer exclusively on the human soul. In fact, Plato has a great deal to say on the topic of the world soul, which he takes to be the ideal cognitive agent (see CORCILIUS 2018: 51–105). Aristotle's criticism of Plato's account of the world soul (advanced in *DA* I 3, 406b26–407b11) remains outside the scope of this chapter.

major innovation: the approach to perishable living beings via separate studies of *animals* and *plants*.

To better appreciate the significance of this second innovation, we need to have at least an idea of the scientific discourse on and around life before Aristotle and Theophrastus. To this end, I propose to start by looking, briefly, at the so-called botanical excursus found in the Hippocratic work *On the Nature of the Child* (*De natura pueri*).³ This work is the second part of a single, continuous embryological account concerned with a human being coming to be from conception to birth. The first part is advanced in the work *On Generation* (*De genitura*).⁴ Very little is known about the (male) author of this embryological account in two parts. Since Hermann Grensemann, it has become common to refer to him as “author C.”⁵ In addition to our two complementary works, author C produced the nosological treatise known as *Diseases 4* (*De morbis 4*). The most recent research on the Hippocratic corpus has also ascribed to him the gynecological works *Diseases of Women 1–2* (*De morbis mulierum 1–2*) and *Infertile Women* (*De sterilibus*), as well as *On Glands* (*De glandulis*).⁶ If we accept these results, our author C turns out to be a medical expert especially (but not exclusively) concerned with women’s bodies. He emerges not only as a productive writer but also as “an important and original thinker, who occupies a pivotal place between the Presocratic thought and the research of the Academy and the Lyceum.”⁷ This is pretty much all we can say about this ancient expert. Still, his scientific credentials, combined with his intellectual ambition, make him an excellent case study for how the discourse on and around plants was conducted before Aristotle and Theophrastus.

Early Greek philosophers such as Empedocles and Anaxagoras had an interest in the study of plants, but the discussion embedded in the treatise *On Generation/On the Nature of the Child* is the earliest extant treatment of the topic of plants in the ancient Greek scientific literature. We want to

³ [Hippocrates], *De nat. puer.* 22–27 Giorgianni.

⁴ In the manuscript tradition, *On the Nature of the Child* follows immediately after *On Generation*. They are, however, marked as separate works. The practice of printing them one after the other with continuous numbering goes back to Émile Littré (LITTRÉ 1851: 462–485). For an in-depth discussion of the relation between these two works, see LONIE 1981: 43–51 and GIORGIANNI 2006: 1–4.

⁵ GRENSEMANN 1982.

⁶ For the *status quaestionis* of what is known about this remarkable ancient expert, see GIORGIANNI 2020: 49–76. The relation between *On Glands* and author C is discussed in CRAIK 2009. I am following the two most recent editors of *Diseases of Girls* (*De virginum morbis*), who stop short of ascribing this work to our author C (LAMI 2007: 15–59 and POTTER 2012: 357).

⁷ CRAIK 2009: vii. Compare CRAIK 2015: 117, 121.

know why author C felt the need to offer a sustained treatment of plants in the context of an account of the formation and development of the human embryo. We are fortunate because our unknown author is forthcoming about his motivations for such an extended discussion. Here is how he restates his main thesis in a memorable way:

Now I shall return to the point in my account for the sake of which these things have been said on these subjects. I maintain that everything that grows in the earth lives from the moisture of the earth, and that whatever kind of moisture a particular kind of earth has in it, this same kind of moisture a plant [growing in it] will have. In the same way the little child also lives from its mother in her uterus and however much health the mother enjoys the fetus too will have. *If one wishes to reflect upon what I have said concerning these subjects, from beginning to end, one will discover that the growth of things out of the earth and human growth are exactly the same* [ἦν δέ τις βούληται ἐννοεῖν τὰ ῥηθέντα ἀμφὶ τούτων, ἐξ ἀρχῆς ἐς τέλος, εὐρήσει τὴν φύσιν πᾶσαν παραπλήσιην εἶδους τῶν τε ἐκ τῆς γῆς φεομένων καὶ τὴν ἀνθρωπίνην]. This is what I have said in the matter. (Trans. Paul Potter, slightly modified)⁸

If we want to understand how an extended discussion on the topic of plants contributes to the embryological account offered in the treatise *On Generation/On the Nature of the Child*, we must take the words I highlighted in italics literally. Unless we take those words literally, our author C comes across not only as a rather undisciplined investigator but also as a hopelessly confused (and confusing) writer, with no firm grasp of the boundaries of his own project. In fact, his whole discussion of plants is controlled by the working hypothesis that human development is, from beginning to end, the same as the growth of plants. Scholars often describe this extended discussion as an “excursus.”⁹ But the use of this word is far from ideal because it ends up suggesting that this stretch of text is an expendable aside. When we put ourselves in this less than ideal frame of mind, it becomes difficult for us to take the words highlighted in italics seriously.¹⁰ At most we are willing to speak of what is going on in this passage as an attempt to develop an elaborate analogy between the growth of plants and that of the embryo in the womb.¹¹ But, again, there is no

⁸ [Hippocrates], *De nat. puer.* 27.15–24 Giorgianni.

⁹ See, for instance, GIORGIANNI 2012: 65–68. His chosen words to describe our whole stretch of text (chapters 22–27) are *parentesi*, *digressione*, and *excursus*. CRAIK 2015: 115, too, speaks of an *excursus*.

¹⁰ With reference to our passage, CRAIK 2015 speaks of a “somewhat exaggerated justification for [the] inclusion” of chapters 22–27 in the formation and development of the human embryo.

¹¹ REPICI 2000: 56–61. Compare LONIE 1981: 83, who also complains that “there is no close analogy between the growth of the embryo as the author describes it and the growth of a plant.”

evidence that our author C is engaged in analogical thinking. Where we see analogous processes, he sees one and the same process at work.¹² Since he thinks the embryo to be identical to a plant, he does not adopt, let alone enforce, a clear-cut division between animals and plants. In fact, it seems important to his argument that no such division is presupposed.

For a better sense of what may license this overall approach to the study of life, we need to look at the background against which this Hippocratic work was written. There is now scholarly consensus that, at least on the topic of plants, author C was not an original thinker. His discussion is reminiscent of Empedocles's ideas on the topic, or at least of theories that are a development along those lines. Furthermore, we cannot exclude that our unknown author also borrowed ideas and concepts from Anaxagoras, Diogenes of Apollonia, and Democritus.¹³ We tend to discount authors who are not perceived as being original thinkers. In fact, they are quite helpful from a historical perspective since they can be used as a reliable entry point into the way in which a certain topic was discussed. But how was the discourse on and around life approached before Aristotle? I would like to answer this question by recalling a piece of doxography advanced at the very beginning of the work known as [Aristotle]'s *On Plants*:

Life is found in animals and plants. But in animals it is patent and obvious, whereas in plants it is hidden and not clear. To establish its existence requires considerable research. The question at issue is whether plants have or have not a soul and a capacity for desire, pain, pleasure, and discrimination.

Anaxagoras and Empedocles maintain that plants are moved by desire, and they assert emphatically that plants can feel and experience both pain and pleasure. Anaxagoras says that plants are animals and feel both pleasure and pain, concluding this from the fall of their leaves and from their growth.

Empedocles supposed that the two classes are mixed in plants.

Likewise, Plato maintained that plants must have desire because of the extreme demands of their nutritive capacity. ([Aristotle], *On Plants* I 1, 815a10–23, trans. E. S. Forster)

I will return to the historical significance of this remarkable work in Appendix III. Here, suffice it to say that its transmission is quite complicated. What E. S. Forster translates here is (in the words of Lotte

¹² LLOYD 1966: 348 sees an “exact parallelism” between the growth of plants and the growth of the human embryo. But, again, the claim our unknown author makes is stronger: he claims that there is one and the same process rather than two parallel processes.

¹³ Full discussion in LONIE 1981: 237–239.

Labowsky) “a medieval Greek translation of a Latin rendering of an Arabic text translated, probably via a Syriac intermediary, from a lost Greek original.”¹⁴ As a result, the English translation reported above must be taken with a grain of salt. It is a bit odd to say that the classes of plants and animals are mixed in plants. This amounts to saying that *X* and *Y* are mixed in *X*, which is not a particularly felicitous claim. Still, the complicated transmission of our work may not be the only reason why the English translation does not sound idiomatic to us. Its author writes from within the Peripatetic tradition. It is also quite possible that this author is recycling information going all the way back to Aristotle and his lost work on plants. This may explain why he takes it for granted that animals and plants are two kinds of living beings.¹⁵ And yet, it is far from obvious that he is entitled to project this distinction back to Empedocles. In fact, the impression is that Empedocles, like Anaxagoras and other Presocratic and Hippocratic authors, operated with a conception of life that was impervious to this distinction. This appears to be a rather thick conception of life, involving a share in cognition – minimally, in the form of pleasurable or painful perceptions and desires. This conception was emphatically not shared by everyone. Diogenes of Apollonia appears to have grouped humans and animals together and appears to have distinguished them from plants.¹⁶ Still, this thick conception is embraced most famously in the *Timaeus*, where Plato ascribes life and soul to plants because they have pleasurable and painful perceptions as well as appetitive desires.¹⁷ This is far from being an isolated claim in the Platonic corpus. In the *Theaetetus*, for instance, we are told that farmers work to replace pernicious perceptions in plants with useful and healthy ones.¹⁸ Since Plato integrates this claim in his elaborate defense of Protagoras as an expert in education whose task consists in replacing bad perceptions with good ones, we cannot rule out that Protagoras himself used this example and even endorsed the view that plants have pleasurable and painful perceptions. I refrain from

¹⁴ LABOWSKY 1961: 132. ¹⁵ The point is already made in DROSSAART LULOFS 1987: 10.

¹⁶ See DK 64 B 2 combined with DK 64 B 4. In the first fragment, Diogenes appears to distinguish animals from plants by their mode of emergence (growing/φύναι vs. coming into being/γίγνέσθαι). In the second, he groups animals and humans together and credits them not only with cognition (νόησις) but also with soul (ψυχή) because they breathe. Since Diogenes appears to have denied that plants can breathe as they do not possess passages for air in their bodies (DK 64 A 19.21–23), we must conclude that, in his view, plants do not have a share in life and are completely devoid of cognition. A discussion of the extant evidence for Diogenes in the context of the Presocratic reflection on life can be found in ZATTA 2017: 59–64 and ZATTA 2023a: 274–275.

¹⁷ Plato, *Tim.* 77 B 3–6.

¹⁸ Plato, *Theaet.* 167 B 7–C 2. This replacement is achieved by supplying plants with whatever they need to flourish (water, rich soil, and sunlight).

engaging in a discussion of the merits of this conception of life. What is relevant for my argument is that before Aristotle and Theophrastus (1) plants were regarded by many, if not most, as living beings and (2) there was a considerable debate as to the powers to ascribe to plants. In particular, (3) life could be understood in a univocal way; as a result, (4) plants could be considered full-blown stationary animals having a share in cognitive powers.¹⁹

Independent evidence in support of what we read in the work *On Plants* that the tradition ascribes to Aristotle is found in a doxographical report going back to Aëtius. The latter organizes the ancient debate on and around plants as follows:

Plato [and] Thales [say that] plants [φυτρά] too are ensouled [ἐμψυχά] living beings [ζῷα]. This is evident from the fact that they move to and from and hold their branches extended, and also that they yield when they are gathered together and then powerfully loosened again, so that they even pull up weights.

Aristotle [says that] they are ensouled [ἐμψυχά], but they are not animals [ζῷα]. For [he says that] animals [ζῷα] [unlike plants] have impulses and sense-perception, and some are also endowed with reason.

But the Stoics and Epicureans [say that] they are not ensouled [ἐμψυχά]. For they say that some animals [ζῷα] share in the impulsive and desiderative soul and some also in the rational soul. But plants [φυτρά] move somehow spontaneously and in a way that does not involve [positing] a soul.

Empedocles says that plants [δένδρα], as first of the living beings [ζῳων], sprung out of the earth before the sunlight was spread around and before day and night had been separated. Due to the proportion present in their mixture [he says that] they contained the structure of the male and the female [within themselves]. They grow from the heat that has been separated out in the earth, so that they are parts of the earth, just like embryos in the belly too are parts of the womb. The fruits are superfluities of the water and the fire in the plants. Some have a lack of moisture, and after it has evaporated in the summer, lose their leaves, while others that have more moisture remain as they are and continue to be in bloom with leaves, as is the case for the laurel, the olive, and the palm. But the differences in flavors result from the variation of the particles of earth and of the plants, which draw varieties of flavors from the *homoiomereiai* of that which nourishes them, as in the case of vines. For it is the differences in the vines that make serviceable wine, but differences in the terrain that nourish them. (*Placita* V 26.1–4 [= *Dox. gr.* 440.4–20]. Trans. Mansfeld-Runia, slightly modified)

¹⁹ The reader will find a useful discussion of the extant evidence for the pre-Platonic claim that plants are perishable living beings endowed with the capacity for sense-perception and desire in ZATTA 2017: 71–77 and ZATTA 2023b: 251–272.

We too often approach doxography as an unphilosophical attempt to organize ancient views with respect to a given topic. In fact, doxography is a perfectly respectable form of philosophical history.²⁰ Our doxographical report is no exception to the rule: it is a philosophically minded attempt to delineate the theoretical options available at the time on the topic of the powers of plants. They are three: (1) plants are ensouled and they are ζῷα (Plato, Thales);²¹ (2) plants are ensouled but they are not ζῷα (Aristotle); and (3) plants are not ensouled and by implication they are not ζῷα (Stoics and Epicureans).²² The chapter ends with a rather longish entry on Empedocles, who reportedly considered δένδρα to be the first ζῷα to spring from the earth even before the sun started its rotation around the earth.

I left untranslated not only “ζῷα” but also “δένδρα” because both words are ambiguous. Let us focus on the second first. If one looks up this word in the new CGL, one finds that “δένδρ(ε)ον” – plural “δένδρ(ε)α” – means “tree” (either wild or cultivated). The same result is obtained if one checks the LSJ. But this cannot be the meaning that this word has in our context. Here it is used to refer to all the plants there might be, including trees. This is confirmed by what we read in the extant fragments from the Empedoclean poem. Typically, δένδρεα refers to plants in general rather than a particular kind of them – tree.²³ The term need not have a technical meaning for Empedocles. He chose this word as a *pars pro toto* for metrical

²⁰ For a defense of doxography as an enterprise motivated by philosophical rather than historical concerns, see FREDE 2022: 19–35.

²¹ The credentials of this doxographic report as a genuine testimony for Thales are not very good. This report is not printed by DK among the testimonies for Thales. I suspend judgment on this point since nothing hinges on accepting this doxographical report as a reliable piece of information for Thales.

²² Stoics and Epicureans do not dispute that nutrition is a necessary condition for sustaining living beings (ζῷα), but they think that having a soul has nothing to do with nutrition. As a result, they separate sharply the soul from nutrition and all the life-sustaining processes involved in nutrition. They account for these processes by tracing them back to a *nature* (φύσις) rather than a *soul* (ψυχή). On the Stoic distinction between nature and soul, I refer the reader to JU 2007: 97–108. This distinction would be received and reinterpreted with a new set of arguments in late antiquity.

²³ For instance, Empedocles gives us the following list of living beings (ζῷα):

plants [δένδρεα], men [άνερες] and women [γυναῖκες], beasts [θήρες], birds [οἰωνοί], and the water-nourished kind of fish [ὑδατοθρέμμονες ἰχθύς], and long-lived gods [θεοί] high in honor. (*On Nature*, lines 270–272 Primavesi)

This list was important to Empedocles since it resurfaced elsewhere in the poem (DK 31B3.6–8). There is a great deal that is interesting in it, starting from the inclusion of gods. They are described as long-lived rather than immortal because they too are subject to generation and destruction as part of the cosmic cycle. The position of plants at the beginning of the list might reflect the fact that plants are the first living beings to emerge from the earth in the cosmogonic process envisioned by Empedocles.

reasons. I will return to the significance of this choice in due course.²⁴ For the time being, let me restate the main message conveyed in the doxographical entry on Empedocles as follows: life emerged from the earth with the spontaneous emergence of *plants* (δένδρα).²⁵ Empedocles considered plants, not just trees, to be the very first *living beings* (ζῷα) to appear on earth in the course of a zoogonic process that was itself inscribed in a narrative account of the origin of the world *ab initio*.²⁶

It is time to turn to the ambiguity of the Greek noun “ζῷα,” which cannot be translated consistently in our doxographical report. The noun “ζῷα” is closely related to the verb “ζῆν,” which can be rendered in English as “being alive.” If we have reasons to think that being alive is one and the same thing for all living beings, then we are entitled to say (with Plato, Empedocles, and maybe Thales) that plants (in our doxographical report either φυτά or δένδρα) are *living beings* (ζῷα). But this entails, in turn, finding out a core notion of life that can support the claim that being alive is the same (kind of) thing for animals and plants. If we have to rely solely on what we read in our doxographical entry, plants are credited with the ability to move themselves to the extent that they can recover their original upright position after being forced to bend.

It is impossible to establish what Thales may have said on the topic of the powers of plants. But it is not difficult to find textual evidence that Plato endorsed the view that being alive and being a self-mover are intimately connected. Consider the following passage from Plato's *Laws*:

CLINIAS: “What you ask me is whether we are to speak of something as being alive [ζῆν] when it moves itself [αὐτὸ αὐτὸ κινῆ].”

ATHENIAN STRANGER: “Yes.”

CLINIAS: “How could it not be [alive if it moves itself]?”²⁷

²⁴ Chapter 5, Section 2.

²⁵ Empedocles was far from being the only early thinker to adopt spontaneous generation as the paradigmatic model of generation. If we accept that the cosmogonic account sketched out by Diodorus Siculus at the outset of his universal history goes all the way back to Democritus, the latter may have adopted a similar style of explanation. See Diodorus. *Hist.* I 7, 3 (= DK 68 B 5.2).

²⁶ This zoogonic process is described in a few famous fragments that have captured the imagination of ancient and modern readers alike. Unfortunately, the details of this process have been the subject of considerable dispute. The most recent attempts at a reconstruction of how Empedocles envisioned this zoogonic process are WELLMANN 2020: 128–158 and FERRELLA 2021: 1–26. On the role assigned to plants in the zoogonic process, see FERRELLA 2019: 75–86.

²⁷ Plato, *Leg.* X 895 C 8–9.

The idea seems to be that all living beings (ζῷα) insofar as they are alive have the power to move themselves. On this view, plants are no exception to the rule. They too move themselves even though they do not displace their bodies in the way other living beings do by moving from one place to another. Admittedly, the evidence offered in our doxographical report for the self-motion of plants is somewhat opaque: plants move to and from (presumably when the wind is blowing) but then they return to their vertical posture, holding their branches extended. But we can easily supply additional, indeed better, putative evidence for the self-motion of plants. Think of a phenomenon such as the movement of plants in response to the variable direction of the sun (or another source of light). For someone who is working in the philosophical tradition, we are now considering such a movement (we call it “heliotropism” or “phototropism”) as a prime example of self-motion.

The claim that plants are *ensouled living beings* (ἐμψυχα ζῷα) finds confirmation in Aristotle, who tells us that his predecessors took ensouled beings to exhibit two conspicuous features: self-motion and cognition.²⁸ Aristotle goes on to say that they all (no one excluded) explained self-motion by positing the existence of a soul understood as a self-mover at the beginning of the chain of motion.²⁹ Aristotle takes this view to be philosophically unsatisfying because it does not explain self-motion; rather, it ends up making it a primitive (and so unexplained) fact. Furthermore, while Aristotle credits both human and nonhuman animals with the power to move themselves, he shows no inclination whatsoever to ascribe this power to plants.³⁰ Last but not least, he does not credit plants with cognition either (the other feature associated with being alive).³¹ In the

²⁸ Aristotle, *DA* I 2, 403b25–27:

The starting point of the research [into the soul] is to set out what is most of all thought to belong by nature to the soul. Now, that which is ensouled is thought to differ from that which is not ensouled chiefly by two things: by self-motion [κίνησις] and by cognition [τῷ αἰσθάνεσθαι].

I take αἰσθάνεσθαι to cover all the phenomena we can trace back to cognition. At any rate, the word cannot be used here to refer, narrowly, to the exercise of the power of sense-perception because Aristotle has yet to argue for the existence of different modes of cognition (sense-perception and thinking). Likewise, it makes no sense for him to refer to motion in general as a sign of life. In this context, he must be thinking of self-motion as one of the most conspicuous activities in which living (i.e., ensouled) beings are engaged.

²⁹ Aristotle, *DA* I 3, 405b31–406a12.

³⁰ A recent discussion of the reasons why, according to Aristotle, plants are alive but are not self-movers can be found in COREN 2019: 33–69.

³¹ By contrast, we have seen that in *Tim.* 77 B 3–6 Plato is willing to ascribe plants a rudimentary form of cognition that does not entail a share in memory, opinion, reasoning, or understanding.

end, Aristotle thinks that we cannot engage in a fruitful study of living beings by adopting a univocal notion of life. An important consequence of this approach is the distinction of perishable living beings into *animals* (ζῷα) and *plants* (φυτά). While both animals and plants are alive, they are engaged in different ways of being alive.³²

But how different are the ways of being alive of plants and animals? Aristotle rejects the view that life is a univocal phenomenon but he does not embrace its opposite. In other words, he does not think that life is an equivocal phenomenon. I will explore what is involved in his position with a concentration on perishable life, namely life as is encountered here on earth. In this chapter and in the following one, I provide the reader with an initial answer to two questions: (1) How different are the ways of being alive of plants and animals for Aristotle? (2) Do they still allow him to engage in a study of animals and plants insofar as living beings? I plan to return to both questions in Chapter 6. It is only at that point that all the elements for a full answer will be in place. So I urge the reader to be patient. In the meantime, I invite the reader to appreciate the reasons for what looks like a new approach to the topic of life by turning to Aristotle's systematic research into the soul.³³

2 Aristotle's Research into the Soul

Traces of the debate I presented in the previous section can be found right at the outset of Aristotle's *De anima*. In motivating the study of the soul, Aristotle states that his research has a significance that goes beyond the narrow boundaries of natural philosophy. At the same time he makes it very clear that this research contributes most obviously, and most directly, to the study of nature. What is immediately relevant to our discussion is the reason Aristotle gives for this claim:

³² Of course, a distinction between animals and plants can be found before Aristotle. But this distinction is typically not informed by a theory. Think of the so-called cyclical argument in Plato's *Phd.* 70 D 8–9, where ζῷα and φυτά are listed as two intuitively obvious subclasses of living beings.

³³ This is a new approach to the topic of perishable life because there is no precursor in ancient Greek thought for the Aristotelian view. It is misleading to think that Diogenes of Apollonia is a precursor of Aristotle. While it is true that Diogenes distinguished sharply between animals and plants, he appears to have done so on the basis of a univocal notion of life. On his view, to be alive is to be able to engage in respiration. What is at stake is not only an alternative account of the role respiration plays in perishable life but also an alternative account of what it means for an animal or a plant to be alive.

knowledge of the soul seems to contribute greatly to all truth but especially to [truth about] nature *because the soul is like a principle of living beings* [ἐστὶ γὰρ οὖτον ἀρχὴ τῶν ζώων].³⁴

Right after the above passage Aristotle goes on as follows:

we are seeking to study and to know the nature and essence of the soul, and then [to study and to know] as many accidents as there are of it. Some of them seem to be affections peculiar to the soul, while others [seem] to belong also to *living beings* [τοῖς ζώοις] on account of the soul.

This second passage confirms that Aristotle sees a very close connection between his research into the soul and the study of living beings. I gloss over the details of this passage, which are quite intricate.³⁵

What matters is my translation of ζῶα as “living beings.” This translation requires a few words of elaboration, especially since I have already argued that Aristotle uses ζῶα to refer to animals to the exclusion of plants. This is generally true. For example, Aristotle says that being alive (ζῆν) belongs to all *living beings* (ζῶσι), but *animals* (ζῶα) alone have a share in sense-perception because there is more to animals than merely being alive (ζῆν).³⁶ Aristotle can make this claim because his considered view is that being alive belongs in one way to animals and in another way to plants. This result follows from a theoretical commitment Aristotle makes when he famously states that “being alive [ζῆν] is said in many ways.”³⁷ The significance of this statement for Aristotle’s study of the soul can hardly be overstated. Aristotle expands on it by offering a list of life activities introduced by the claim that any one of them suffices for being alive: thinking, perceiving, change with respect to place, and change with respect to nutrition, decay, and growth.³⁸ There is a great deal that is interesting in the strategy employed at this juncture of Aristotle’s argument. To begin with, Aristotle does not try to define life or being alive. Instead, he offers us

³⁴ Aristotle, *DA* I 1, 402a4–7.

³⁵ Briefly, Aristotle distinguishes three kinds of items: the soul, the affections that belong to the soul, and the affections that belong to the living being in virtue of possessing a soul. We will soon learn that it is far from clear that there are special affections of the soul in addition to those that belong to living being in virtue of having a soul. The only possible candidate for this role is thinking (403a3–10).

³⁶ Aristotle, *DA* II 2, 413b1–2. This claim is also found elsewhere in the Aristotelian corpus. But when Aristotle makes this distinction elsewhere, he is relying on results achieved in his *De anima*. See, for instance, *Juv.* 1, 467b16–25, where Aristotle distinguishes between being alive (ζῆν) and being an animal (ζῶον). More on this front in Chapter 2, Section 3.

³⁷ Aristotle, *DA* II 2, 413a22.

³⁸ Aristotle, *DA* II 2, 413a23–25. Here I take *nous* and *aisthesis* to refer to activities rather than powers or capacities. The Greek allows for this ambiguity.

what he takes to be an exhaustive list of activities. Any one of them suffices for life. Furthermore, Aristotle does not distinguish between cognitive and non-cognitive activities; rather, he treats thinking and perceiving on a par with nutrition, decay, and growth. They are all regarded by him as life activities; as such, they are all traced back to a soul as their ultimate source.³⁹ Since any one of them suffices for life, Aristotle must explain how they come together in different kinds of living beings. When Aristotle says that there is more to animals than being alive, he means to say that the kind of life exemplified by animals involves, in addition to change with respect to nutrition, decay, and growth, the presence of sense-perception, minimally in the form of sense of touch. Such a life entails the ability to feel pain and pleasure as well as the ability to desire, minimally in the form of appetitive desires. All this follow, directly and immediately, from having the power for sense-perception.

Aristotle elaborates further on the way he envisions the relation between sense-perception, the ability to feel pain and pleasure, and the ability to desire in the context of his discussion of embodied cognition in *DA* III 7. Here Aristotle discusses how the activation of sense-perception leads an animal to pursue or to avoid something. It is emphatically not the case, Aristotle says, that an animal *first* perceives something pleasant or painful and *then* pursues or avoids it; rather, perceiving something pleasant or painful is *ipso facto* pursuing or avoiding it.⁴⁰ The capacity for pursuit and the capacity for avoidance are not different from one another or from the perceptual capacity; it is only their *being* that is different.⁴¹ In other words, there are not three distinct powers in the animal; rather, there is only one power but this power is either taken by itself as in sense-perception or is taken in relation to how the animal reacts to that which is good (pleasant) or bad (painful) for it.⁴²

³⁹ By saying this I do not mean to suggest that the celestial unmoved movers are ensouled (for Aristotle, they are disembodied intellects engaged in thinking). Rather, I am trying to capture the Aristotelian assumption that the soul as the source or principle of living beings is to be regarded as the form of a living body. The research focus of Aristotle's *De anima* is on ensouled bodies understood as hylomorphic compounds.

⁴⁰ In-depth discussions of this important passage can be found in CORCILIUS 2011: 117–143 and GASSER-WINGATE 2021: 160–176. I find myself in agreement with Gasser-Wingate when he says that “perception is an affectively loaded form of cognition – an awareness of something combined with attending feelings of pleasure or pain” (173).

⁴¹ *DA* III 7, 431a13–14.

⁴² In *DA* III 7, 431a10–14, Aristotle tells us that the activation of the perceptual mean with respect to the good (pleasant) or the bad (painful) as such is a necessary and sufficient condition for the explanation of why the animal pursues or avoids something. The addition of the qualification “as such” (ἡ τοιαῦτα) is important. An episode of perception has a perceptual content; however, it is not because of that perceptual content that the animal pursues or avoids something but rather because

Unlike animals, plants are merely alive in the sense that they are barred from having a share in the higher (cognitive) powers of the soul. Aristotle separates plants from animals and makes room for a type of life that does not involve cognition – namely, plant life. It may turn out to be quite difficult for Aristotle to decide whether a certain creature is an animal or a plant. But this is an epistemic difficulty that does not preclude him from holding that a perishable creature must be either an animal or a plant. *Aristotle can maintain that there is a dividing line between animals and plants even if he is not able to discern that line.* His clearest pronouncement on this front is found at the outset of *HA* VII (VIII), where he announces that nature does not make leaps but rather proceeds by small steps to the point that we may fail to see the boundary between animate and inanimate things, as well as the boundary between plants and animals.⁴³ Gradualism need not entail the absence of boundaries in nature. It only means that these boundaries are hard to find. Aristotle discusses a few borderline cases in his study of animals. They are all sea creatures that are plant-like in the sense that they resemble plants. Some of these creatures are attached to rocks or other hard surfaces in the sea and cannot survive when detached (pinnae and razor-mussels are explicitly mentioned). Still, the presence of a rudimentary form of cognition in these borderline creatures is sufficient for considering them animals rather than plants.⁴⁴

the animal perceives a content of sense-perception that also happens to be good (pleasant) or bad (painful) for the animal.

⁴³ Aristotle, *HA* VII (VIII) 1, 588b4–30. Virtually the same point is made in *PA* IV 5, 681a10–15. The Roman number in round brackets for *HA* is a reference to the book in the ordering printed in BEKKER 1831. This ordering goes back to Theodore Gaza and his enormously influential edition of Aristotle's *De animalibus* (first edition printed in 1476). David Balme reinstated the pre-Gaza ordering of the books in his *editio maior* of the whole *HA* (BALME 2002) as well as in his *editio minor* of *HA* VII–IX (BALME 1991). The reasons for returning to the pre-Gaza ordering are discussed in BEULLENS-GOTTHELF 2007: 471–477. The ordering adopted by Gaza is forcefully defended in KULLMANN 2014a: 291–294 (followed by SCHNIEDERS 2019: 97–106 and EPSTEIN 2019: 82). While this ordering is not adopted on the authority of Gaza, and it depends on a certain reading of the argument that they share with Gaza, I still find it safer to adopt the traditional ordering found in the Greek and Latin manuscript tradition.

⁴⁴ Goffrey E. R. Lloyd has developed an alternative reading of these borderline cases (in LLOYD 1996c: 67–82). He has argued that these cases present Aristotle with a real difficulty. This difficulty cannot be explained away by considering it an epistemic difficulty. It has to do with the very *nature* of these sea creatures (emphasis mine). These creatures meet certain criteria for being animals while they also meet other criteria for being plants. Hence, they are neither fully animals nor fully plants. According to Lloyd, this does not entail that “animals” and “plants” are not viable scientific categories for Aristotle, let alone that there are no boundaries at all in the natural world. It only means that these boundaries are not as sharp as we may think they are *if we stop at the theoretical pronouncements made in Aristotle's De anima*. But when we go beyond those pronouncements and look at how Aristotle proceeds in his actual study of animals, we see that he is a careful investigator who is willing to reflect on the applicability of his theoretical distinctions once he is presented with a problematic case.

The division into animals and plants cannot be presupposed at the outset of Aristotle's research into the soul; rather, it is a theoretical achievement that is secured only in the context of this research. Moreover, it is an achievement that requires elaboration and defense. My brief review of the discourse on and around living beings before Aristotle suggests that the distinction between animals and plants was not seen, let alone shared, by everyone at the time. While Aristotle's predecessors and contemporaries would have agreed that the soul is a source of life in the sense that it is that which distinguishes what is alive from that which is not, they would not have granted him the distinction between animals and plants. Alternatively, they would have drawn this distinction in a different way. For instance, they would have granted that plants are a different kind of living beings, but they would have insisted that plants do have a share in cognition nonetheless. A prime example for this strategy is Plato, who in the *Timaeus* describes plants as *another* (kind of) *living being* (ἕτερον ζῷον) different from the human being.⁴⁵ While he holds that plants do not have a share in judgment, belief, and intelligence, he grants them sense-perception and feelings of pleasure and pain accompanied by appetitive desires.⁴⁶

We can firm up the results reached so far with the help of a passage from the *Epinomis*, a dialogue attributed to Plato:

ATHENIAN STRANGER: When a soul and a body come together to form a single structure and produce a single form, do we assent that this is most truly said to be a *living being* [ζῷον].

CLINIAS: Yes.

ATHENIAN STRANGER: So this kind of thing is most correctly called a *living being* [ζῷον].

CLINIAS: Indeed.⁴⁷

This passage suggests that when Aristotle was about to embark on his research into the soul, a living being (ζῷον) was considered a complex of soul and body in which the soul is the ultimate source of life.⁴⁸ So Aristotle is fully justified in assuming, right at the beginning of *De anima*, that the

⁴⁵ Plato, *Tim.* 77 A 5.

⁴⁶ Plato, *Tim.* 77 A–C. For an in-depth discussion of what may be involved in Plato's claim that plants have a share in sense-perception, see CARPENTER 2010: 281–303 (reprinted, with minor changes, in BALDASSARRI-BLANK 2021: 37–53).

⁴⁷ [Plato], *Epin.* 981A–B. The dialogue is spurious. Our ancient sources attribute its authorship to Philip of Opus.

⁴⁸ A few other passages from the Platonic corpus can be offered as additional evidence for the link between having a soul and being alive. Here I quote *Phd.* 105 C9–D5:

“So answer,” [Socrates] said. “*What is it that which, whenever it comes to be present in a body, makes the body alive?*” [ὥς ἂν τί ἐγγένηται σώματι ζῶν]”

“It is *soul* [ψυχή],” [Simmiias] replied.

soul is “like a principle of living beings.”⁴⁹ We can take this initial statement as an *indistinct whole* (καθόλου) of the sort described at the outset of *Phys.* I 1.⁵⁰ At this early stage of the argument, we are introduced to something that requires a great deal of elaboration and articulation. More directly, both “principle” and “living beings” are ambiguous. A main task of the subsequent research consists in clarifying this initial statement. Among other things, Aristotle is expected to tell us (1) what kind of principle the soul is, (2) how many kinds of living beings there are, and (3) which of them is (or are) immediately relevant to the project attempted in *De anima*.

The ambiguity and tentativeness of ζῶα at the outset of Aristotle's *De anima* is often overlooked or minimized. I will not engage in a full review of the numerous translations of this passage.⁵¹ I am content to single out the new translation produced by Christopher Shields for the Clarendon Aristotle Series because of its visibility and importance. Shields translates our sentence as follows: “for the soul is a sort of principle of *animals*.”⁵² On this reading, Aristotle's *De anima* may be taken to have a distinctively zoological orientation right from the start. The most outspoken defender of a zoological reading of Aristotle's *De anima* is Pierre Pellegrin, who has developed an interpretation that makes it a treatise about animal psychology.⁵³ It is far from clear that Shields is advocating such a reading. His view seems to be that animals are mentioned at the outset of Aristotle's research into the soul because they are the most obvious (and least controversial) example of living beings. Animals so understood include the human being. On this reading, the opening lines of *De*

“Is this always the case?”

“Absolutely.”

“Is it, therefore, the case that *whenever soul takes possession of a body, soul always come to it bringing life?* [ψυχὴ ἄρα ὅτι ἂν αὐτὴ κατὰσχη, αἰεὶ ἥκει ἐπ' ἐκεῖνο φέρουσα ζωὴν]”

“Yes, it does.”

⁴⁹ Aristotle, *DA* I 1, 402a6–7.

⁵⁰ In *Phys.* I 1 Aristotle sketches out an account of how we come to know first principles. This is an account that requires the investigator to inject clarity into something that is initially confounded (see FALCON 2017: 41–59). This sketch must apply to any kind of research, so it must also apply to research into the soul as the principle of living beings.

⁵¹ For a review of the English translations of this passage, see LENNOX 2021a: 175–176.

⁵² SHIELDS 2016: 1 (emphasis mine). The old Clarendon translation (HAMLYN 1993²) renders the Greek as follows: “for the soul is as it were the first principle of *animal life*.” An educated guess is that this translation is motivated by the same set of concerns at work in the new Clarendon translation. But the old translation is inferior to the new one: without consulting the Greek text, no one would be able to tell that “animal life” stands for ζῶα.

⁵³ PELLEGRIN 1996: 465–492. In his view, right at the outset of the work, Aristotle would be looking ahead to his study of animals: “the *De anima* must be annexed to the zoological writings, to which it is a sort of general introduction” (466).

anima do not exclude that there are living beings other than (human and nonhuman) animals. Part of the task that Aristotle takes upon himself, right from the start, consists in clarifying what sort of principle the soul is, and whether there are ensouled beings beyond the most obvious case of human and nonhuman animals.⁵⁴

Such a reading ends up being close but not identical to the one I have developed so far. My view can be restated by saying that ζῶον/living being is a *pre-theoretical concept*. This is a concept that is not informed by the subsequent theory advanced in *De anima*. By contrast, ζῶον/animal is a concept isolated in the course of Aristotle's research into the soul.⁵⁵ As such, it is a *normative concept* that Aristotle is expected to adopt in his study of animals. Quite tellingly, he explicitly invokes this second concept whenever it is needed or appropriate for him to do so.⁵⁶ At least in this sense, it is correct to say that the research into the soul conducted in *De anima* plays a foundational role for the zoological writings. This research orients, and indeed structures, the study of animals by providing the investigator with a suitable theoretical framework. More to the point: the very possibility of focusing animals to the exclusion of plants depends on adopting the normative concept introduced in *De anima*.⁵⁷

Let me elaborate further on Aristotle's task as it emerges from the opening statement of his *De anima*. At the outset of the treatise, ζῶα can only mean "living beings." But ζῶα is not simply ambiguous between (1)

⁵⁴ One may try to expand on the little Shields says on this front. For instance, one may try to argue that it is the ordinary use of the Greek ζῶα that makes animals a *prima facie* uncontroversial instance of living beings. But this would require establishing that there is such an ordinary use of ζῶα as animals and that Aristotle is taking his lead from there.

⁵⁵ An instructive attempt to outline what is entailed in such a concept can be found in ALTHOFF 2005: 616–620. It is immediately clear that ζῶον/animal is part of a dense network of concepts Aristotle develops in *De anima* and elsewhere. The first and most obvious is αἴσθησις/sense-perception (as understood by Aristotle).

⁵⁶ Here are a few examples (without any pretense of being exhaustive): *Sens.* I, 436b10–12; *Juv.* I, 467b18–25; *PA* II 1, 647a20–21; *PA* III 1, 666a34; *GA* I 23, 731a30–34, 731b4–5. In all these cases, the criterion for being an animal (ζῶον) is the presence of the power of αἴσθησις/sense-perception. Moreover, in a few of these cases, Aristotle makes explicit contact with the results reached in his research into the soul. This is additional evidence that Aristotle assigns a foundational character to this research.

⁵⁷ The strategic relevance of the research into the soul conducted in *De anima* for Aristotle's study of animals has never been in question. What has been (and still is) debated is whether, and eventually to what extent, the framework provided by Aristotle's research into the soul is normative for his study of animals. Goffrey E. R. Lloyd acknowledges the programmatic relevance of Aristotle's *De anima* for the science of the living beings (LLOYD 1992: 146–167 [reprinted in LLOYD 1996a: 38–66]). At the same time, he argues that Aristotle remains an open-minded investigator who is willing to revise the theoretical pronouncements made in *De anima* (and elsewhere) whenever he is presented with a difficult case (LLOYD 1996b: 67–82). For Lloyd, the difficult cases are all borderline cases where the distinction between animals and plants is difficult to enforce.

living beings, including plants, and (2) animals, to the exclusion of plants. The situation is decidedly more complicated. When, in the *Epinomis*, Clinias agrees to call an ensouled being a living being (ζῶον), he agrees to call a *heavenly body* a living being. If the reader is not persuaded that the ζῶον can be used to refer to both mortal and immortal living beings, I suggest turning to the *Timaeus*, where Plato says that “everything that partakes of life [ζῆν] may justly and with perfect truth be called a *living being* [ζῶον].”⁵⁸ Plato makes the etymological connection between life and living being as he introduces plants as another kind of living beings next to the human being. According to him, plants ought to be called living beings (ζῶα) because they partake in being alive. His polemical target is the position that denies that plants are living beings by denying that they are ensouled.

When we reflect on what Plato says on the topic of plants, we appreciate why the doxographical tradition has no qualms registering Plato as a defender of the view that plants are living beings (ζῶα). And yet, when we look at the actual use that Plato makes of ζῶον in the *Timaeus*, we discover that he uses it to refer to things as different as:

- (1) the *cosmos*, which is described as an intelligent, ensouled ζῶον (*Tim.* 30 B 1) and a visible ζῶον containing all the ζῶα that there might be (*Tim.* 30 D 3–31 A 1)
- (2) the *fixed stars* and the *planets*, which are described as ζῶα (*Tim.* 92 B 5)
- (3) *animals*, which are called ζῶα (*Tim.* 92 C 2)
- (4) *plants*, which are collectively referred to as another (kind of) ζῶον (*Tim.* 77 A 5 and *Tim.* 77 C 3)
- (5) the *sexual parts* of the male and the female human being, which are described as a self-willed ζῶον (*Tim.* 91 A 2 and *Tim.* 91 C 2).⁵⁹

For Plato there exist both perishable and imperishable living beings (ζῶα). Moreover, not only the cosmos but also the heavenly bodies are imperishable living beings (ζῶα). Both deserve to be called “gods” (θεοί). For instance, Plato refers to the cosmos as a *blessed god* (*Tim.* 34 B 8–9) and to the heavenly as *visible gods* (*Tim.* 40 A 1–3, *Tim.* 40 D 4).⁶⁰ In other

⁵⁸ Plato, *Tim.* 77 B 1–3.

⁵⁹ I note, in passing, that Aristotle adopts similar language in *MA* II, 703b20–22. He speaks of each of these parts as a *separate* living being (ἑσπερ ζῶον κεχωρισμένον).

⁶⁰ By speaking of “visible gods,” Plato is contrasting the heavenly bodies, whose conspicuous revolutions we can see and study, with the capricious gods, who show themselves only when they want and to whom they want (*Tim.* 41 A 3–6). For an idea of what Plato may mean by capricious gods, whose epiphanies are erratic and unpredictable, think of the Muses who appeared to Hesiod when he was

words, the connection between living beings/ζῶα and gods/θεοί is explicitly made in the *Timaeus*.⁶¹ With this observation in place, we can now return to Aristotle's *De anima*.

Up to this point, I have placed great emphasis on the first two occurrences of the term ζῶα at the beginning of Aristotle's *De anima*. However, this term resurfaces again a few lines later in the following passage:

As it is now, those who speak and research into the soul seek to study the human soul only. But we must be careful not to ignore the question whether its account is one, like in the case of *living being* [ζῶον], or different for each soul, like in the case of horse, dog, human being, and *god* [θεός]; *living being* [ζῶον], the universal, being either nothing or posterior.⁶²

Here Aristotle sets himself apart from all his predecessors. While they were mostly concerned with the human soul, he is ready to engage in research that is not programmatically restricted to any kind of soul. An obvious question for anyone who wants to embark on such an unrestricted investigation is whether the soul is a sufficiently homogeneous principle of living beings. In fact, the insertion of “god” next to “horse, dog, human being” makes the case for the heterogeneity of the soul quite pressing. To begin with, it is not at all obvious that the soul has sufficient unity to be the object of a single investigation. If the soul understood as the principle of life can give rise to vastly different ways of life, such as the life of a human being, the life of a horse or a dog, and the life of a god, one may legitimately wonder whether we can engage in an unrestricted study of the soul. Furthermore, it is not at all clear how such a study is to be conducted if the goal is to give an account of the soul that applies to human beings, dogs, horses, and gods. We should resist any easy way out of these methodological concerns. We cannot dismiss the presence of “god” next to “horse, dog, human being” by positing that this word was originally added as a marginal gloss and was subsequently incorporated into the main text. The presence of “god” in our text is dictated by the logic of ancient Greek thought: anything that partakes of life can be called a living being – a ζῶον. A god, *qua* living being, is no exception to the rule.⁶³ Aristotle goes on to say that living being (ζῶον), the universal, is either nothing or something

tending his sheep at the foot of Mount Helicon. They chose to appear to Hesiod but not to other shepherds (*Theogony* 22–23).

⁶¹ The earth is described as the first and most senior among the gods in *Tim.* 40 C 2–3. As a result, the earth too must be regarded as an ensouled ζῶον.

⁶² Aristotle, *DA* I 1, 402b3–8.

⁶³ Recall the pseudo-Platonic definition of god as imperishable living being advanced in [Plato], *Def.* 411a3–4.

posterior. Either option becomes attractive only if gods are regarded as living beings alongside dogs, horses, and human beings. But if so, then we may be left with no choice but to entertain the thought that “living being” (ζῶον) is a term that can be predicated of vastly different kinds of beings. In this scenario, we should therefore take very seriously the possibility that “living being” is not predicated in the way a genus is predicated of its species but in some other attenuated way to be further explored.⁶⁴

For an idea of how Aristotle would like to deal with these methodological concerns, we must jump to the beginning of the second book. There, Aristotle is no longer concerned with all the living beings that there might be. By his own admission, he is now primarily concerned with *perishable living beings*.⁶⁵ This restriction is already in place when Aristotle gives his most common (and non-reductive) account of the soul. For Aristotle, the soul is the first actuality of a natural, organic body that has life potentially.⁶⁶ We do not have to wonder what “life” may mean in this context since just a few lines before giving his most common account of the soul Aristotle tells us that being alive entails being able to engage in *self-nutrition, growth, and decline*.⁶⁷ What these life activities have in common is that they are necessary for the life of *perishable living beings*.⁶⁸ The obvious question is why the restriction to perishable

⁶⁴ I am in broad agreement with the conclusion reached in JOHANSEN 2012: 47–48, even though Johansen omits discussion of the significance of the insertion of “god” next to “horse, dog, and human being.”

⁶⁵ Aristotle, *DA* II 2, 413a31–32. I add the qualification “primarily” because the focus on perishable living beings does not rule out that some of the results can be extended to imperishable living beings. The difficult question of how this extension is to be pursued remains outside the scope of this chapter. For additional reflections on this front, I refer the reader to FALCON 2009: 167–181.

⁶⁶ Aristotle, *DA* II 1, 412b27–28.

⁶⁷ Aristotle, *DA* II 1, 412a14–15: “we call life nutrition [of the living being] through itself, growth and decline” (ζῶν δὲ λέγομεν τὴν δι’ αὐτοῦ τροφήν τε καὶ αὔξησιν καὶ φθίσιν).

⁶⁸ Whether these activities are also *sufficient* for the life of perishable living beings depends on whether we can read reproduction into this short list of life activities. Reproduction is instrumental to the perpetuation of perishable life, so its absence from the list is conspicuous and puzzling. One way to deal with this absence is to try to read reproduction into the text. Recall that Aristotle traces not only nutrition and growth but also reproduction back to the nutritive power of the soul. His considered view is that self-nutrition, reproduction, growth, and decline are manifestations of one and the same power, which he describes as the power to preserve itself (*DA* II 4, 416b17–19). But this move is far from convincing. How can the readers of *DA* II 1 presuppose results that become available only in *DA* II 4? The alternative is to consider the definition Aristotle gives us at the outset of *DA* II (“we call life nutrition [of the living thing] through itself, and growth and decline,” *DA* II 1, 412a14–15), a preliminary definition. As such, this definition could not be the final word on the topic by Aristotle. It could only serve as an *interim* definition giving us a first orientation as we progress with our research into the soul. Richard King has explored a version of this strategy in a recent article. He thinks that this definition of life in terms of nutrition and growth gives us a physical grounding forhylomorphism in living things, while it does not represent the final word on the topic by Aristotle (KING 2021b: 43–61).

living beings is not an arbitrary one. Since right at the outset of his investigation Aristotle has criticized his predecessors for having arbitrarily restricted their study of the soul to the case of the human being, we want to know why his own restriction is not vulnerable to the same criticism.

An answer to this question can be given by reflecting on the analogy Aristotle establishes between powers of the soul and rectilinear plane figures:

Now it is clear that there will be one account in the same way of soul and rectilinear plane figure: for just as there is no rectilinear plane figure beyond the triangle and the rectilinear plane figures ordered in the series, so here soul is nothing beyond the [powers of the soul] mentioned.⁶⁹

The centrality of the analogy between powers of the souls and rectilinear plane figures for a correct understanding of the project attempted in Aristotle's *De anima* cannot be disputed.⁷⁰ Among other things, this analogy reveals that Aristotle has a plan for the study of the soul, and this plan not only dictates how Aristotle deals with the powers of the soul in the rest of the work but also helps him draw the boundaries of his own research. Aristotle argues that just as rectilinear plane figures are ordered in a series beginning with triangle, so are the powers of the souls. The first in this second series is the so-called nutritive power of the soul. The relevant powers of the soul are distributed across perishable living beings in such a way as to give rise to different kinds of souls. In other words, Aristotle can speak not only of a nutritive power but also of a nutritive soul. As a result, not only the relevant powers of the soul but also the different types of souls are ordered in a series beginning with the nutritive soul. This explains why Aristotle can say that the study of each (type of) soul is also the most appropriate study of the soul.⁷¹

To be sure, the analogy with rectilinear plane figures provides Aristotle with a non-arbitrary method to study the relevant powers of the soul. But it also provides him with a non-arbitrary method to approach the related phenomenon of perishable life. What is alive and perishable is minimally subject to growth and decline, and neither growth nor decline are possible without engaging in self-nutrition. What Aristotle says on the topic of thought and thinking is surely relevant to a study of a life that does not

⁶⁹ Aristotle, *DA* II 3, 414b20–22.

⁷⁰ See WARD 1998: 113–128, who insists on the “logical interpretation” of our passage. And yet this analogy also has important ontological implications for the unity of the soul. I will return to those implications in Chapter 6, Section 2.

⁷¹ Aristotle, *DA* II 3, 415a12–13.

include self-nutrition, growth, and decay – namely, the life of a god. According to Aristotle, there exist both disembodied (separate) intellects and heavenly bodies. Not only the former but also the latter are divine living beings engaged in thinking. So a few of the results reached in the course of the study of *nous* as the principle of thought and thinking can be extended to these divine living beings.⁷² At the same time, however, both the life of separate (immaterial) substances such as the disembodied intellects and that of imperishable material substances such as the celestial bodies remain outside the scope of Aristotle's *De anima*. From the second book onward, Aristotle's research into the soul is programmatically restricted to the soul as a source of perishable life. As a result, this research concentrates, at least primarily, on the kinds of perishable living substances we encounter here on earth.

In the subsequent Peripatetic tradition, the study of the soul was from the very start programmatically restricted to the study of the soul of perishable living beings. In this tradition it was customary to take a shortcut by focusing right from the beginning on a particular group of living beings. Here is, for example, how Alexander of Aphrodisias introduces his own *De anima*:

It is our aim to speak of *the soul of the body subject to generation and perishing* [περὶ ψυχῆς τῆς ἐν γενέσει τε καὶ φθορᾷ σώματος]. We will discuss its substance and its powers: what they are, how many they are, and how they differ from one another. (Alexander of Aphrodisias, *De anima* 1.1–3; emphasis mine)

Alexander goes on to say that he finds more truth in the views passed down from Aristotle than in what other thinkers have claimed on the same topic, and that he will fulfill his stated aim by setting out Aristotle's views on the soul as clearly as possible. Alexander is promising an account that will follow the one advanced in Aristotle's *De anima* very closely. There remain a few small but philosophically significant differences. The one that matters here is how Alexander embarks on his research into the soul. He does so by restricting his investigation right from the start to the soul that is a principle of perishable life. This restriction is surely faithful to Aristotle's thought. By now, however, it should be abundantly clear that the shortcut adopted by Alexander was not available to Aristotle. Aristotle must work his way into the position that Alexander

⁷² But how this can be done is a large and complex issue that does not concern us here. For more on the challenges facing the investigator who tries to extend results reached in Aristotle's *De anima* to the study of imperishable life, see FALCON 2005: 85–112.

takes for granted. Alexander can take this shortcut only because all the conceptual groundwork was already done by Aristotle.

3 Aristotle and the Study of Animals and Plants

Aristotle's *De anima* provides the foundation for a theoretically informed study of life on the crucial assumption that the soul is that which distinguishes what is alive from that which is not. Aristotle's first, and arguably most important, step in the study of life is his decision to focus on perishable life. The significance of this initial move can hardly be overstated. Given that for Aristotle there is life in the superlunary world, one may legitimately wonder whether he has developed the conceptual resources to justify his concentration on perishable life to the exclusion of imperishable life. The answer to this question is to be found in the analogy between rectilinear plane figures and powers of the souls. This analogy supplies Aristotle with a non-arbitrary method for the study of the soul as a source of life for perishable living beings.

The analogy between rectilinear plane figures and powers of the souls suggests that there are three kinds of souls. Consequently, there are three kinds of perishable life: plant life, animal life, and human life. The capacity for thought and its exercise, thinking, are a distinctive mark of the third kind of life. But while the study of this capacity is an integral part of research into the soul, it is not itself an integral part of natural philosophy. Aristotle makes this point in his general introduction to the study of animals: "one should not speak of the soul in its entirety, for it is not the soul in its entirety that is a nature but [only] some part of it (either one part or more parts)."⁷³ The same point resurfaces in the *Metaphysics*:

it is the task of the natural philosopher to study the soul *to some extent*, namely [to study] all [the parts of] the soul [that are] not [conceivable] without matter.⁷⁴

From what Aristotle says elsewhere, it is clear that he means to rule out the capacity for thought from the purview of natural philosophy.⁷⁵ For Aristotle, natural philosophy is concerned with the soul under a certain description – namely, the soul as the nature of a living body. This description does not apply to *nous* as the principle or source of human thought.⁷⁶

⁷³ Aristotle, *PA* I 1, 641b9–10. ⁷⁴ Aristotle, *Metaph.* VI 1, 1026a5–6.

⁷⁵ Aristotle, *Metaph.* XII 3, 1070a24–27.

⁷⁶ I defend this claim in FALCON 2005: 19–22. On *nous* and nature, see BROADIE 1996: 176–193; HUSSON 2012: 207–237; LENNOX 2009: 1–18 (somewhat updated in LENNOX 2019a: 100–107); LENNOX 2021a: 193–198. The view that there are limitations to what is studied by Aristotle's natural

While Aristotle cannot accommodate *nous* as a principle of human thought within nature, he is able and willing to make a reference to such a principle in the study of nature. This becomes clear as soon as we realize that Aristotle explains certain features of the human body teleologically with reference to the human capacity for thought. Aristotle can consistently claim that we must refer to *nous* as the principle of human thought if we want to arrive at a scientifically adequate understanding of the human body, and at the same time he can maintain that *nous* falls outside the boundaries of natural philosophy. The explanation of the human erect posture illustrates this point very well. For Aristotle, the upright posture distinctive of the human being is for the sake of facilitating human thinking.⁷⁷ The explanation of the human tongue is another instance of the same phenomenon. According to Aristotle, the human tongue is different from that of all other animals because it is exceptionally soft and flexible to allow for human speech, which is a necessary (but not sufficient) condition for human thought.⁷⁸ Clearly, (1) the human body and its various parts are a legitimate topic for natural philosophy, and (2) a full explanation of their arrangement and functioning requires a reference to the human capacity for thought; but (3) this does not entail that this capacity falls within the realm of nature. We can restate points (1) to (3) by saying that *nous* functions as an explanatory principle in rendering premises relevant to the explanation of the human animal, but it is not itself a fitting object of study for natural philosophy. In due course I will argue that the human animal is not only a fitting object of natural investigation but it also plays a somewhat special role in the context of Aristotle's study of animals.⁷⁹ For the time being, let me stress that once we remove the study of the capacity for thought from the realm of natural philosophy, we are left with two forms of perishable life: plant life and animal life, with

philosophy when it comes to the soul is minoritarian. Most scholars think that Aristotle can accommodate *nous* within the domain of natural philosophy. For the majoritarian view, see SEGEV 2017: 177–209 and FREY 2018: 160–174. These scholars tend to push the passages from *PA* I 1, *Metaph.* VI 1, and *Metaph.* XII 3 to the margins of their interpretation of Aristotle. This is part of a long tradition that goes back to Alexander of Aphrodisias. On Alexander and his highly selective reading of Aristotle when it comes to the topic of *nous*, I refer the reader to FALCON 2021C: 246–260.

⁷⁷ See Aristotle, *PA* II 16, 660b29–661a14. For a discussion of the explanation of erect posture offered by Aristotle (and Plato), see GREGORIC 2005: 183–195.

⁷⁸ *PA* II 16, 659b30–34 combined with *PA* II 17, 660a19–23. In addition to the ability to speak a language, the powers for memory and *phantasia*, as well as a great deal of experience (*empeiria*), are also required for thought. The capacity for thought must not be confused with its enabling conditions, even though it cannot be exercised in their absence.

⁷⁹ See Chapter 3, Section 2.

human life as a particular kind of animal life. It is because Aristotle takes animals (human beings included) and plants to be different kinds of perishable living beings that he is justified in approaching the study of perishable life via separate studies of animals and plants.

This conclusion can be squared with the view that the human being occupies a somewhat unique place in Aristotle's cosmos. A famous passage from *DC* II 12 can help us make progress on this front.⁸⁰ Here Aristotle confronts a difficulty that casts doubt on the claim that there is order in the natural world. One might expect order to entail that the things that are closer to the first unmoved principle of the cosmos engage in fewer activities, while those that are further away from that principle display an increasingly complex behavior. This is in fact not the case, either in the celestial region or in the sublunary world. For the sake of our argument we can concentrate on the sublunary world, where human beings display a vastly more complex behavior than animals and plants. Furthermore, plants are stationary living beings, and they are only engaged in self-nutrition and reproduction. Should we conclude that plants are closer to the best condition enjoyed by the first unmoved mover? Of course not.

Aristotle offers his solution to this difficulty with the help of an analogy: some people may remain fit without physical exercise; others may need little exercise to stay fit; others still may need to engage in a variety of strenuous physical exercise to attain the same goal; finally, there are also a few who must settle for a lesser goal because they can never be fit regardless of how much physical exercise they undertake. This lesser goal can be one of the very things done for the sake of the higher goal – for instance, weight loss. Losing weight when one is overweight is a necessary but not sufficient condition for fitness. But how are we expected to apply this elaborate analogy at the cosmological level? Here is the answer: while animals and plants are like those people who must settle for a lesser goal because they cannot achieve fitness, human beings are in a predicament comparable to those people who are required to engage in an elaborate

⁸⁰ A recent, in-depth analysis of this passage and its anthropological implications can be found in RAPP 2019: 77–96. The epistemological status of what Aristotle accomplishes in this passage is disputed. Jointly with Mariska Leunissen, I argued (in FALCON-LEUNISSEN 2015: 217–240) that by appealing to what is reasonable Aristotle is not merely offering a dialectical solution falling short of the strict standard of natural scientific knowledge, nor is he providing us with natural scientific knowledge in the strict sense. Rather, he is trying to reduce our puzzlement by offering convictions that are suitable for humankind. I bracket the epistemological complications generated by Aristotle's appeal to what is reasonable. For the sake of the present argument, I take the account as if it were a straightforward contribution to natural science.

scheme of action to stay fit. In this respect, human beings are different not only from higher (divine) living beings, which achieve their goal with little or no action, but also from lower living beings, which are permanently barred from achieving that goal.

Human beings enjoy a somewhat special status among perishable living beings. They alone have a share in the divine goal, which is to be understood as the exercise of the activity characteristic of imperishable (divine) living beings. This activity is theoretical thinking. When we are engaged in this sort of activity, we are active with our best part, which is also a divine part. But the exercise of this activity requires us to engage in a variety of more mundane activities. I have in mind activities such as perceiving, storing memories, and speaking a language. It does not take long to see that these more mundane activities are not on a par with theoretical thinking. They are all activities that are common to the soul and the body; as such, they cannot be adequately explained without a reference to the body. By contrast, theoretical thinking can, indeed should, be considered apart from its bodily implementation, especially if it is an activity we share with the disembodied intellects. In this sense, it exceeds the boundaries of nature. We are back to the same conclusion as before: while we cannot make sense of the complexity of human life without a reference to the human capacity for thought, *nous* understood as the principle that explains this capacity is excluded from natural philosophy. This exclusion makes it possible for Aristotle to subsume human life under animal life and makes it possible for him to consider human and nonhuman animals as a single investigative domain.

Separate studies of animals and plants are announced at the outset of Aristotle's *Meteorology*:

It has already been spoken about the first causes of nature and all natural motion; also about the stars that are ordered in the motion of the heavens, and about the bodily elements, [establishing] how many they are and what their nature is, and how they change into one another, and about generation and perishing in general. There remains for consideration a part of this investigation that all predecessors called "meteorology." These things are natural, although their order is less perfect than that of the first bodily element. They take place in the region nearest to the motion of the stars, such as the Milky Way, the comets, and the inflamed and moving portents. They are also the affections that we may posit to be common to air and water, and furthermore the kinds, parts, and affections of the earth, from which we might study the causes of winds and earthquakes and all the things that happen in accordance with their motions. Some of these things puzzle us, while we may be able to touch upon others in some way. Furthermore,

[the investigation] is concerned with the falling of thunderbolts, with whirlwinds and fire-winds, and furthermore with the recurrent affections that are produced in these same bodies by concretion. Once we have dealt with these things, we will see whether we are somehow able to give an account, in accordance with the method indicated, *of animals and plants, both in general and separately* [περὶ ζώων καὶ φυτῶν, καθόλου τε καὶ χωρὶς]. Once this is done, perhaps the whole of what was established by us at the outset will be completed.⁸¹

This passage presents us with a sketch of the study of nature as envisioned by Aristotle. Like any other sketch, this one lacks in detail. For one thing, there is no reference to the human being. For another, there is no mention of the research into the soul. It is hardly controversial that we can read a reference to the human being in our passage. Much more delicate is the absence of any explicit reference to research into the soul. This absence can be handled in more than one way. It can be explained away by saying that we are only given the main lines of natural philosophy as understood by Aristotle and saying that certain details are inevitably left out. But it cannot be ruled out that Aristotle's research into the soul, while it has foundational character for the study of living beings, is not itself a part of natural philosophy. If so, the study of the principle of perishable life (the soul) is not to be conflated with the study of perishable life (animals and plants).

Recall the passages from *PA I* and *Metaph.* VI where Aristotle states that the power of thought and the ensuing activity of thinking go beyond the scope of natural philosophy. What Aristotle says at the beginning of his *Meteorology* can be taken to be additional evidence (although only negative) that the relation of the research into the soul to natural philosophy is not as straightforward as the relation of a part to the whole.⁸² We may not be able to decide, once and for all, between the two exegetical options outlined above. What is certain, however, is that a chronological move is not available to us. We cannot say that the absence of any reference to the research into the soul is evidence that Aristotle wrote his *Meteorology* before

⁸¹ Aristotle, *Meteor.* I 1, 338a20–339.

⁸² I argued for this view in FALCON 2005: 16–22. The practice of reading Aristotle's *De anima* into the research project outlined in the *Meteorology* goes back at least to Alexander of Aphrodisias. However, Alexander cannot be especially authoritative on this very point since he is manifestly engaged in a selective reading of the relevant texts. Alexander never mentions the passage from the *Parts of Animals* where Aristotle tells us that the study of the power for thought is not a part of the study of nature. In fact, Alexander acts as if this passage does not exist. Elsewhere I argued that this silence is a deliberate choice on his part since this passage does not fit well with his overall interpretation of Aristotle's natural philosophy (FALCON 2021C: 246–260).

his *De anima*. Even if there is no explicit mention of the research into the soul in the programmatic passage at the beginning of Aristotle's *Meteorology*, it is easy to see that this research is part of the relevant theoretical background. Without the results achieved in the context of Aristotle's *De anima*, we would not be able to understand why we need to study *animals* and *plants* rather than *perishable living beings*.

Aristotle does not only outline the main topics of natural philosophy at the outset of his *Meteorology*; he also lists them in a definite order. This is the order in which they are to be studied.⁸³ Consider the first topic: a study of the first causes of nature and all natural motion (*Meteor.* I 1, 338a20–21). This is a brief yet precise reference to the investigation contained in the eight books of his *Physics*. It is even possible to read into this description a division of the investigation offered in the eight books into two distinct *pragmateiai*: a study of nature and a study of motion.⁸⁴ Whether or not we accept this reading, it is uncontroversial that a general study of nature, combined with a general study of motion, serve as a sort of theoretical prolegomenon to the ambitious research that comes to an end only when we have also given an account of “*animals and plants*.” When we consider the commitment to the study of animals and plants within this theoretical framework, we see that there is nothing conventional about the order in which Aristotle lists the various natural investigations at the outset of his *Meteorology*. An optimal study of the natural world requires that the general study of nature offered in the eight books of Aristotle's *Physics* be in place before we embark on any one of the specialized studies that jointly constitute natural philosophy.⁸⁵

For different reasons, I would like to argue that the order in which animals and plants are listed in the opening lines of Aristotle's *Meteorology* is an indication of the order in which their study should be approached. The research in natural philosophy outlined by Aristotle ends with a study of perishable living beings, which consists of separate studies of animals and plants to be carried out in the following order: *first* animals, *then* plants. This order of inquiry is far from obvious. In fact, it is mildly surprising. Let us return, briefly, to the inquiry into the soul offered in Aristotle's *De anima*. When we look at how Aristotle proceeds in the second book, we see that he ascribes nutrition, growth, and reproduction to one and the same part of the soul, the so-called nutritive (alias vegetative) soul. We also see that he engages

⁸³ See BURNYEAT 2001: 7–24; FALCON 2005: 2–7; RASHED 2005: cxliv–clii.

⁸⁴ BRUNSCHWIG 1991: II–40.

⁸⁵ The unity and organization of Aristotle's writing on natural philosophy is a major theme in FALCON 2005 (especially 1–30).

in a study of the various parts of the soul starting from the nutritive soul. This suggests a bottom-up approach to the study of the basic powers of the soul and their corresponding life activities. Why not transpose this overall approach to the study of perishable living beings? Why not begin the study of perishable living beings with a study of plants and then move on to a study of animals?⁸⁶

My answer to the above questions is offered in the rest of this book. Here I am content to stress that *studying the principle of perishable living beings (the soul) need not be the same as studying perishable living beings (animals and plants)*. Aristotle is not compelled to follow the strategy adopted for the study of the powers of the soul when he turns to the study of animals and plants. His reasons for the explanatory strategy adopted in the study of animals and plants must be found within that study rather than outside it. At this early stage of my argument, let me only highlight a further aspect of my overall interpretation. Aristotle assigns a paradigmatic status (as opposed to a merely heuristic one) to animals in his study of perishable living beings. His working hypothesis is that the methodological results achieved in the context of the study of animals can somehow be extended to the study of plants. The qualification “somehow” is important. Part of my task in Chapters 4 and 5 consists in clarifying how, and indeed to what extent, these results can be extended from one investigative domain (animals) to the other (plants). For the time being, let me recall one important rule of inquiry that controls Aristotle's overall strategy: all investigations ought to start from the thing that is most developed and as such is also better in nature.

An especially clear formulation of this rule of inquiry is found in a fragment from the now lost *Protrepticus*:

Prior things are always more knowable than posterior things, what is better in nature [is more knowable] than what is worse: *there is knowledge more of what is organized and determinate than of their opposites* [τῶν γὰρ ὀρισμένων καὶ τεταγμένων ἐπιστήμη μᾶλλον ἐστὶν ἢ τῶν ἐναντίων].⁸⁷

⁸⁶ I note, in passing, that this order of investigation is found in all the medieval Arabic and Latin classifications of the so-called natural sciences. In al-Fārābī's *On the Sciences* (*De scientiis*), we find the study of plants and the study of animals listed respectively as the seventh and eighth parts of natural philosophy. The same order is found in the Avicennian corpus of natural philosophy, where the discussion of the soul (*liber sextus naturalium*) comes before the study of plants (*liber septimus naturalium*) and animals (*liber octavus naturalium*). This reversal of the order found in Aristotle's *Meteorology* resurfaces in the Latin tradition (e.g., in Gundissalinus's tract *On the Division of Philosophy*). More instances of the same phenomenon could be given. All the above authors seem to think that the order of investigation we adopt for the study of the principle of perishable living beings (i.e., the soul) should also be adopted for the study of perishable living beings.

⁸⁷ Aristotle, *Protr.* B 33 Düring (= Iamblichus, *Protr.* 38.7–8 and *De comm math sc.* 81.7–11).

Additional passages from the Aristotelian corpus in which the order of explanation follows the order of nature – with the order of nature having normative force over the order of exposition – can be highlighted.⁸⁸ According to Aristotle, animals are more developed, and so more complete (and more perfect), living beings than plants; as a result, we must begin our investigation of perishable living beings from them rather than from plants. Theophrastus appears to share this idea. In Chapter 4, I argue that he embarks on his study of plants on the implicit assumption that the study of animals is already in place.

In Chapter 5, I show that Theophrastus adopts explanatory strategies that are reminiscent of those that Aristotle himself employs in his study of animals. Like Aristotle, Theophrastus approaches the study of living beings via separate studies of animals and plants. Like Aristotle, he gives explanatory priority to the study of animals. By deploying analogical reasoning, Theophrastus appears to be confident that a few results reached in the context of the study of animals can be extended to the study of plants. When we take all this into consideration, we see that the Peripatetic study of animals and plants as outlined at the outset of the *Meteorology* betrays a definite order of inquiry: *Aristotle and Theophrastus study the more complete and more perfect form of life (animals) before embarking on a study of the one that is less complete and less perfect (plants).*

The epistemic principle mandating that we start our inquiry from that which is more organized and more complex need not clash with the one that requires us to begin our investigation from that which is simpler. As will become clear in due course, animals do not only display more organization and more structure than plants; they also display a more *unified* organization and a more *unified* structure than plants. We can restate this point by saying that the complexity and structure present in animals display *organic unity* in a better and more perfect way than the complexity and structure present in plants. I will elaborate further on this front in Chapter 3. For the time being, I would like to return to the other promise made at the outset of Aristotle's *Meteorology*. Aristotle promised not only to study "*animals and plants*" but also to study them "*both in general and separately.*" These words are evidence that the complete science envisioned at the outset of the *Meteorology* contains separate studies of animals and plants, and that each of the two studies has a common as well as a special component. Scholars have often found the rationale for what

⁸⁸ For example, Aristotle, *GA* II 4, 737b25–27. For a recent discussion of this methodological principle, see LEUNISSEN 2017: 56–74 (especially 58–66).

appears to be a complex explanatory structure in *PA* I. There, Aristotle says that the explanation of certain features of animal life are to be sought across different kinds of animals. He adds that such explanations are required to avoid tedious repetitions. His examples are sleep, respiration, growth, decline, and death.⁸⁹

What Aristotle says in this passage is eminently reasonable. And yet, avoiding needless repetitions cannot be his sole (let alone main) motivation for this explanatory strategy. The theory of scientific explanation outlined in *Posterior Analytics* requires Aristotle to give explanations at the correct level of generality. This requirement is central to his explanatory project. It is only by giving explanations at the right level of generality that we can capture salient features that might otherwise be missed. What Aristotle has in mind is best illustrated by recalling a famous example introduced in Aristotle's *Posterior Analytics*: we have proper knowledge of the fact that the sum of the triangle's internal angles is equal to two right angles if, and only if, we know that this property belongs to all triangles insofar as they are triangles.⁹⁰ Since this geometrical property belongs to all triangles, it also belongs to equilateral, isosceles, and scalene triangles. But it does not belong to them in virtue of the fact that they are equilateral, isosceles, or scalene. Rather, it belongs to them because they are triangles, or else in virtue of the fact that they are three-sided figures. Aristotle employs this example to show that there is a common explanatory level beyond that of equilateral, isosceles, and scalene triangles. He argues that this common explanatory level is reached by ignoring those facts that are specific to equilateral, isosceles, and scalene figures.

The sketch outlined at the beginning of Aristotle's *Meteorology* is seriously underwritten, so it is an entirely open question how much we are entitled to read into it. But we cannot rule out, it seems to me, that the explanatory principle introduced in Aristotle's *Posterior Analytics* informs the study of animals and plants announced in the opening lines of his *Meteorology*. There is, however, a residual ambiguity. We can read these lines as containing the promise to engage in separate studies of animals and plants (to be approached in this very order). On this reading, both studies consist of a common component followed by more specific components. But we cannot rule out that these lines announce a general study of animals and plants *in addition to* separate studies of animals and plants. We can

⁸⁹ Aristotle, *PA* I 1, 639a19–21.

⁹⁰ Aristotle, *APo* I 4, 73b32–74a3. Aristotle illustrate this epistemological request in *APo* I 5 by discussing three ways in which we can fail to provide explanations at the right level of generality. An excellent discussion of this chapter can be found in HASPER 2006: 252–284.

think of this general study of animals and plants as an analogue to the general study of triangles that is required along with narrower explanations given for the different kinds of triangles. When we are engaged in this general study, we consider animals and plants in common insofar as they are perishable living beings. As readers of Aristotle's *Meteorology*, we do not know how much there is to be explained in common for animals and plants *qua* perishable living beings. I am centrally concerned with this question in the next chapter. Here I would like to highlight that the project of a general study of perishable life – that is, a study that treats certain aspects of animal life and plant life in common – is not ruled out by what Aristotle promises at the outset of the *Meteorology*. On the contrary, such a project must be taken seriously because it is mandated by the theory of scientific explanation advanced in Aristotle's *Posterior Analytics*.

In this chapter we have encountered for the first time the two epistemic principles outlined in the Introduction. While the first requires us to begin our investigation into perishable life from the most complex and most determinate form of life, the second may be read as entailing that we start this investigation from the most widespread phenomenon. These principles pull us in different directions. While the first requires us to engage in an investigation into perishable life starting from animals rather than plants, the second mandates a focus on what is common to both animals and plants. At this early stage of our argument, we do not know how Aristotle resolves this tension. We only know that both principles are equally important for Aristotle. The next chapter will take our discussion to the next level by showing how Aristotle negotiates their application in the context of the so-called *Parva naturalia*.