

# Ancient Commentators on Aristotle

GENERAL EDITOR: RICHARD SORABJI

## PHILOPONUS: On Aristotle Physics 1.4–9

Translated by  
Catherine Osborne

B L O O M S B U R Y



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# Contents

Abbreviations	vi
Introduction	1
Textual Emendations	27
Translation	29
Notes	135
Bibliography	154
English-Greek Glossary	155
Greek-English Index	160
Subject Index	180
Index of Passages	183

## Abbreviations

CAG = *Commentaria in Aristotelem Graeca*, ed. H. Diels, 23 vols (Berlin: Reimer, 1882-1909).

DK = Hermann Diels and Walther Kranz, *Die Fragmente der Vorsokratiker*, 3 vols (Berlin: Weidmann, 1951).

KRS = G.S. Kirk, J.E. Raven and M. Schofield, *The Presocratic Philosophers*, 2nd edn (Cambridge: Cambridge University Press, 1983).

Ross = W.D. Ross, *Aristotle's Physics: A Revised Text with Introduction and Commentary* (Oxford: Clarendon Press, 1936).

# Introduction

## 1. Aristotle *Physics* Book 1

At least on the surface, Aristotle devotes most of the first book of the *Physics* to an investigation of the Presocratic philosophers: to their attempt to identify the first principles of being, and their difficulties concerning change. Even where these difficulties are concerned with change in the natural world, in things subject to natural processes of change – hence falling under what Aristotle calls ‘physics’ – they are issues that we would today identify as falling under the domain of *metaphysics*. In the chapters discussed in this section of Philoponus’ *Physics commentary* Aristotle explores a range of questions about the basic structure of reality, the nature of prime matter, the principles of change, the relation between form and matter, and the issue of whether things can come into being out of nothing, and if so, in what sense that is true.

These are key issues in Aristotle’s own thought and much of Aristotle’s work in these chapters is, in fact, offering new and positive contributions from Aristotle’s own voice, despite the fact that the structure of the book continues, at least superficially, to follow the pattern of reviewing the past contributions in the field, which we tend to regard as the standard Aristotelian method on beginning a new subject.<sup>1</sup> Here in Chapters 4 to 9, having already dismissed the Eleatics (in Chapters 2 and 3) on the grounds that they do not make a contribution within the field of natural philosophy at all,<sup>2</sup> Aristotle turns to look at those Presocratic thinkers who were making a positive contribution to the analysis of the first principles underlying natural things, and to the explanation of natural change (according to Aristotle’s criteria). Aristotle’s discussion purports to be a survey of all the possible positions that one can take on these issues, but with particular reference to the various positions that Aristotle’s predecessors have severally chosen to take. Is there one first principle, or more than one? What options are there for how we generate things from the basic principles? In what sense do things come from *what is not*?

In reality almost none of Aristotle’s work in these chapters is focused on exegetical analysis of the Presocratics. Almost all of it is his own constructive work, designed to yield results on topics such as the relation between form and matter, and the best way to analyse change.



The survey of past thinkers assists Aristotle in explaining what are the seductive traps that we need to avoid in developing a satisfactory position on these matters, and how his own proposed theories will address these risks in a more satisfactory way. The Presocratics are mentioned, of course, but not for the sake of accurately reporting what they said so much as for the sake of diagnosing and addressing issues of metaphysical importance.

## 2. Key features of Philoponus' commentary style

In this volume we encounter Philoponus in mid-stream, taking up the thread at page 86 of the *CAG* edition, which is the beginning of his discussion of Chapter 4 of *Physics* Book 1. There is, therefore, no introductory material as there might be at the start of a new book or lecture course. However, the entire text is a model of clarity and good order, and follows Philoponus' normal method of presentation of his commentary in the form of a twofold exposition of carefully defined sections of text. Each section, which perhaps formed the work for a single session of the School seminar, comprises a double treatment of the chosen portion of text. The first treatment is expository. Elsewhere Philoponus sometimes called this section the *protheôria*.<sup>3</sup> It explains the issues that arise in the chosen section of text and Aristotle's motivation for treating these issues. This is followed by a more detailed section of exegesis and textual analysis, sometimes called *lexis* or *exêgêsis tês lexeôs*,<sup>4</sup> which deals with problems or puzzles about the precise way to understand what Aristotle wrote.

In this translation these divisions in Philoponus' work are explicitly articulated with the use of numbered headings, showing how the first section of expository discussion precedes a related section (sometimes very brief) of short textual commentary. The headings here are all editorial. Philoponus does not use headings, and in some cases the editor of the Greek text in the *CAG* (Vitelli) did not clearly identify the structure either. In certain cases the *CAG* edition fails to mark out the new lemma at the start of the *lexis* section, frequently, though not invariably, because it repeats the words of the lemma that started the entire section.<sup>5</sup> Furthermore, a number of lemmata in the *lexis* sections run on as continuations of a preceding passage, and in these cases it can be difficult to judge how strong a division to make, since Philoponus often builds the lemma into his own sentence.<sup>6</sup>

As we might expect, then, the section of commentary translated here opens with an outline of the contents of part of Chapter 4 of the first book of the *Physics*; that is, the section from 187a10 to 187b4. Most of Philoponus' sections are subdivisions within the larger chapters that we have in our editions but on occasion his division of Aristotle's text does not exactly match the chapter divisions in our modern editions. For instance, in the part identified in this translation as section 7 he treats

a large portion of text that goes across the division currently made in our texts between Chapter 6 and Chapter 7, and does not break at all at what we take to be a new chapter.

### 3. Key issues in the interpretation of Aristotle and the Presocratics

The discussion opens with an analysis of the work of several Presocratic thinkers who (according to Philoponus, reporting Aristotle) had an acceptable account, whereby it is rightly said that all things are in some sense one: namely because they originate from a single source. This is by contrast with the *unacceptable* monism of the Eleatics which had been discussed in the earlier chapters.

Philoponus offers a brief survey (86,21-87,10) of the ways in which this development from a single source is realised by the various non-Eleatic thinkers who offered a single material principle (that is, Thales, Anaximenes, Anaximander and Heraclitus), and then proceeds (87,11) to analyse the work of Anaxagoras (a thinker identified not with a single first principle but with the idea of deriving a plurality from a *mixture*, by extraction).

The account of Anaxagoras is recognisable, in so far as Philoponus mentions Anaxagoras' 'uniform parts' (the so-called *homoiomeries*) which contain portions of everything in them, and Mind or *Nous* which is the force that is responsible for separating things out. However, Philoponus implies that the failure to secure the total separation of *pure* substances from the mixture has something to do with Mind's failure to complete the task, as though there were no obstacle in principle to the idea that Mind might extract a pure sample of some stuff. Indeed Philoponus speaks (87,21) as though the 'portions' within the mixture are particles, like seeds in a heap of mixed grain. However he swiftly acknowledges (87,30) that this model does not exactly achieve what is intended since in the case of a heap of grain it is perfectly possible to pick out a grain that is pure barley. By contrast in Anaxagoras' world, the divine Mind can never pick out a pure stuff. That task is impossible. We might ask whether Mind fails to pick out single grains only because it is still at the stage of taking scoops that do, as it happens, contain a mixture of different things, as though the mixture is not in fact uniform through and through *ad infinitum*, but is just so thorough that the task has yet to be completed (and will perhaps always be uncompleted however long you go on). Or is it that there is an important disanalogy between Philoponus' heap of grain and the model envisaged by Anaxagoras, so that the reason that it is impossible for Mind to reach a pure substance by extraction is that there really are not pure particles there to be had? Philoponus seems to note a failure in his analogy, but does not adequately diagnose where the disanalogy lies, except in respect of the mismatch between possibilities.

Philoponus subsequently returns to a more detailed discussion of issues relating to Anaxagoras, in connection with the criticisms mounted by Aristotle, against Anaxagoras, at *Physics* 187b7 to 188a18. These criticisms are reviewed and discussed by Philoponus in the two parts of Section 2 of this volume (96,3 to 101,28 and 101,29 to 108,11), although the topic is also introduced in the preceding section (from 89,3).

Philoponus identifies five arguments against Anaxagoras in Aristotle's work. The first is an *ad hominem reductio*, Philoponus says.<sup>7</sup> That is, it is not based on anything to do with the facts of the matter but is merely designed to show that Anaxagoras' position undermines itself. The idea here is that Anaxagoras' position on the infinity of the principles makes scientific knowledge impossible, so that his claims to scientific expertise cannot be upheld. Here Philoponus does not himself offer an opinion for or against Aristotle's claim that knowledge is impossible in the case of *ad infinitum* divisibility; he just reports Aristotle's argument. In so far as there is input from Philoponus it is in his work on identifying how the argument serves as an objection to Anaxagoras, and in particular in showing that it is couched as an *ad hominem* argument designed to undermine Anaxagoras' thesis on the basis of his own views.<sup>8</sup> However, while Aristotle himself seems to draw the conclusion that what is infinite cannot be known (and hence concludes that Anaxagoras could not know his *principles*), Philoponus draws the further inference that science in general thereby becomes impossible.

The second argument is the one that Aristotle offers at 187b13-21. This one is said to be 'factual' (96,26) by contrast with arguments by *reductio* or *ad hominem*. This seems to mean that it is based on axioms that Aristotle himself would accept, and that are taken to be true, whereas the *ad hominem* argument adopts the hypotheses of the opponent and shows them to be self-refuting.

In this case Philoponus does more to engage with the problems in his own right. To start with he sets out to explain what Aristotle's argument is. The idea is that there is a natural limit on how large an animal or plant can be, and it follows that although the size of things varies, and the size of their parts varies accordingly, there is a natural limit on how small or large any part will ever be. This counts against Anaxagoras' claim that the smallness of the ultimate parts is unlimited. Philoponus re-expresses this as an axiom about forms:

The second objection is factual. Aristotle adopts an axiom of the following sort: all the forms naturally subsist in some finite quantity, and do not naturally grow to just any size, nor naturally shrink to just any smallness, but there is a limit both to the greater and to the smaller, beyond which the form cannot exist. (*in Phys.* 96,26-30)

Philoponus then proceeds to illustrate the idea with some examples, showing first that although one is accustomed to giants and dwarfs, there are limits on the size that a human being might come in: one cannot imagine a human being (say) as big as the universe, nor one smaller than a fig pip. Similar arguments go for things like ships, jars and so on, and then the point is applied to the parts of which such things are composed, which will have the same proportion to the whole as the parts have in a normal specimen. The thought, then, is that the parts (say flesh and bone) that compose a human being will never be smaller than the size they would be in the smallest conceivable human being.

Thus far, Philoponus' comments seem to have been designed as faithful exegesis and illustration of the point that he finds in Aristotle. The next paragraph, however, looks to be his own additional offering. He goes on:

One might also discover that this is so from the following: all composite bodies are formed not of matter mixed just anyhow, but each form needs matter mixed just so, in order that the form should supervene on the matter once the matter has thus become suitable for receiving it. (*in Phys.* 97,23-7)

The earlier practice of offering examples in support of Aristotle's argument here blends seamlessly into a new practice, namely offering another observation, even another argument, that is not present in Aristotle but leads to the same conclusion. Here the new argument seems to be based on premises that Philoponus and his readers are supposed to accept, although it is not clear whether they are supposed to be authentically Aristotelian. The idea is that there is a particular material mixture that is required for a particular form to be present, as though the structure of the matter is set up first and then the appropriate form 'supervenes' once the mixture is just right.<sup>9</sup> Probably the procedure is not meant to be temporal but rather logical: a particular form (say 'flesh') presupposes a particular kind of matter (some proportion of earth, air, fire and water) while bone, say, will require a different proportion in the mixture. In the absence of the right matter, or in the presence of the wrong matter, you will not have the right form. Philoponus wheels in this understanding of the hylomorphic structure of reality in order to support the idea that there is a limit on the smallness of the quantity of any particular substance, because it transpires that correct *quantities* and not just correct *qualities* in the underlying matter are part of what makes flesh and bone the stuffs they are. Philoponus' thought is that by parity of reasoning, if we suppose that the quality of the underlying stuff has got to be definite and not just vague, so too the quantity, since that is crucial to the resulting body.

The argument looks weak, since it is surely the proportion in the mixture that determines its character, not the absolute size of the

quantities. It looks as though Philoponus has slipped from the thought that there must be some definite proportion to thinking that there must be some finite size. However he now goes on to respond to a potential objection on those lines:

In response to these points, the mathematically trained raise a difficulty for us. If it is granted, say they, that the given straight line is divided in two, since every magnitude is divisible *ad infinitum*, evidently we might also divide the flesh, which you say is minimal, into two. Well then, are the divided bits flesh or not? If they are of flesh, then it is possible to get flesh smaller than the given one, and that was not the minimum. On the other hand if the divided bits are not of flesh, how do they make flesh when they are put back together again? And if flesh is uniform, evidently its parts would be flesh. So it is possible to get a smaller piece than any flesh you have got, since all flesh is also uniform. (*in Phys.* 98,13-21)

Here the people who talk to mathematicians invoke infinite divisibility, since flesh is a homogenous compound. Should it not be the case that it is divisible *ad infinitum*, and the parts of flesh will always be flesh no matter how small you divide it? Philoponus raises this objection on behalf of mathematics, but then offers his own rebuttal:

In response to these points we say that it is possible to take flesh either as a form or as a magnitude. As a magnitude, flesh is divisible *ad infinitum* (so that it is not possible to get a minimal magnitude) whereas as a form it is no longer possible to divide it *ad infinitum*, but it will invariably stop at some minimal flesh. (*in Phys.* 98,21-5)

The thought here is that, mathematically, it is true that one can subdivide a quantity of flesh *ad infinitum* (if it is conceived abstractly as a quantity), but it does not follow that the smaller quantities that are yielded by such a division are quantities *of flesh*. You may start with a quantity of flesh, at the macroscopic level, and that is a homoiomerous stuff, because the parts of flesh are flesh. Yet it may still be true that there is a limit on how far you can subdivide and still have flesh as the parts. Mathematically the quantity continues to be divided but the result is no longer parts of flesh but parts that are too small to be flesh.

It is not immediately obvious how valid this objection to Anaxagoras is. It seems to be an attempt to show that divisibility *ad infinitum* does not necessarily yield homogeneous results at all levels, even if it does at the macroscopic level. Philoponus illustrates the principle with a number of non-homoiomerous things (human beings, houses and ships) where the thought is that once you have divided them into parts that

are not alike, you have a mere heap of components, which do not form something with the relevant form unless they are correctly composed with the 'presiding nature' (in the case of natural forms) or the 'presiding craft' in the case of artefacts, which imposes the form. These illustrations are not entirely helpful, since the point is supposed to be about materials that are made through and through of parts of the same sort. But Philoponus concludes by repeating his idea that for flesh, say, there is a bottom line to the homogeneity, and further division beyond that point yields a heap of components but not an item that retains the crucial structure and form of flesh.<sup>10</sup>

Philoponus identifies two axioms as premises for this 'Second argument against Anaxagoras', namely (i) at 187b13ff., the axiom that every form subsists in a quantity of finite size and cannot shrink to just any degree of smallness (96,27) and (ii) at 187b25, the axiom that any finite body is exhausted by the extraction of finite bodies, after a finite number of extractions of finite size. The second axiom is expressed in the following way at 99,26: 'A finite body is measured by a finite body, the greater by the lesser'. This appears to mean that there is always a unit of finite size that will exactly divide the larger body, such that the larger body is an exact multiple of the smaller measure (a yard is three feet; a metre is 100 centimetres and so on). In every case, there will be a way of dividing the body, such that the whole is an exact multiple of the chosen unit.<sup>11</sup> It then follows that once that smaller quantity has been extracted the appropriate number of times, the whole body will have been exhausted and there will be no remainder. However small the smaller unit, the number of times taken to exhaust the whole will still be finite.

It seems that Philoponus takes these two axioms together (rather than as two separate objections as is usual in modern commentaries), in order to yield the conclusion that the extraction cannot go on for ever, because the quantities of flesh, say, that are being extracted will in fact be finite quantities, of a certain minimal size (by the first axiom): smaller than that and they would no longer be flesh.<sup>12</sup> But if you extract such minimal quantities, of finite size, repeatedly, then by the second axiom, the whole will eventually be exhausted. Only if the quantity extracted could be reduced to ever smaller quantities *ad infinitum* could the extraction (from a finite body) go on for ever without exhausting the supply. But this is ruled out by the first axiom.

Philoponus identifies a third objection to Anaxagoras, starting at 187b35. This is rather briefly sketched at 100,22-7, and again very briefly at 105,26. It seems to be rather similar to the second objection and invokes a restatement of the second axiom about the fact that extracting finite quantities exhausts the whole. The difference is possibly that we are here asked to consider extracting further quantities from what is said to be the minimal quantity of flesh, not from the whole body.



The fourth of the five arguments against Anaxagoras is sketched at 100,28-101,4, and again at 106,5 when Philoponus comments on the text of the relevant passage (at 188a2-3). This objection is a reflection on the idea that every portion, among the infinite number of portions supposedly contained in a finite body, itself contains a further infinity of portions. The resultant multiple infinities are thought to be absurd. This is then extended (100,35-101,4) to suggest that there will be an infinity times infinity of places, occupied by these distinct portions of stuff, on the basis of Aristotle's reference to these stuffs as 'isolated from each other' at 188a3.

The fifth in this list of objections to Anaxagoras is about Anaxagoras' 'Divine Mind'. At 188a10 Aristotle declares that this Mind is 'absurd' (*atopos*) but Philoponus prefers to re-express this as 'unintelligent' (*anoêtos*), so as to draw out the absurdity of a mind that tries to achieve the conclusion of an infinite task, which is an unintelligible project. *Nous* in Anaxagoras' system is supposed to have set out to separate the components completely; but the components are *ex hypothesi*, incapable of being completely separated because the process of separation is unending. So the supposedly intelligent mind is really not intelligent at all, because it tries to achieve something that is evidently impossible. Philoponus treats this objection at 101,5-17 and 106,20-107,10. Philoponus also notes that Aristotle diagnoses the impossibility of the task of separation not just on the basis of Anaxagoras' own theory (that the things can never be completely extracted) but also on the basis that the items to be extracted include qualities, which can logically never be segregated from their substrates, since qualities only have their existence in a substrate.

The analysis of this series of arguments against Anaxagoras provides a good illustration of Philoponus at work on Aristotle, where Philoponus serves as both an exegete and a critic, adding to and supplementing what he finds in Aristotle, mainly with a view to construing the argument correctly, disambiguating problems and assessing whether what Aristotle says, thus construed, is a valid objection to Anaxagoras' views.

Sections 3 to 12 of this text now turn to consider the truth about the principles of reality – that is, the truth according to Aristotle, as interpreted by Philoponus – starting with the idea that the formal principles always come in contraries, and proceeding to explain the relation of matter to privation, and concluding that there is a kind of triad of principles, the two contraries (form and privation) and matter as the third one, forming the substrate. The first part of this discussion (section 3) once again reviews the work of the Presocratics, as part of the attempt to show that all the ancient thinkers were working towards the truth, at least insofar as they were identifying contrariety as a key concept in the account of the principles. However, Philoponus is faced with a difficulty because Aristotle's rather hasty list of Presocratic thinkers who invoked contrary principles is really not very relevant to

the task of identifying pairs of *formal principles* which are to act upon something else, namely matter. Someone (as Philoponus observes at 110,15) might very well say that these Presocratic thinkers were trying to make the *material principle* a pair of contraries, and this really is not a good route to go. Indeed Aristotle has named some of the most inconvenient and implausible cases: he chooses Parmenides (claiming that he had hot and cold as his principles but admitting that in fact Parmenides called them fire and earth) and Democritus who counts as having two because the atoms and void can be described as full and empty, thing and nothing or being and non-being. Philoponus also gratuitously and unhelpfully supplies Empedocles (110,4), not for his Love and Strife as we might expect<sup>13</sup> but rather because the four elements are to be divided into fire (hot) and all the rest (cold). Additionally he adds that Plato had invoked the large and the small, and that these were material principles for Plato (110,13,16).

At 110,25 Philoponus addresses this imaginary challenge over the fact that these predecessors were surely not talking about the formal causes but rather looking at pairs of *material principles*. He responds not by refuting the challenge, but rather by accepting it, and then suggesting that it is not, after all, irrelevant to observe at this point that Plato and the Presocratics consistently appeal to contrariety even among material principles. For this shows that they were at least grasping something of what it means to be a *principle*. The main criteria for something being a principle are, he suggests, quoting Aristotle (a) 'not to be derivative from other things'; (b) 'not to be derivative from each other'; and (c) that other things be derivative from them. The ancients' efforts at identifying contraries as the principles of matter were not without merit in respecting these desiderata in the search for principles, despite the fact that they failed to investigate the formal principles and settled for contrariety in material principles instead. In addition it is helpful, he suggests, to notice that the Pythagorean table of opposites (which he provides on p. 124 of this commentary), underpins the suggestion that earlier thinkers were appealing to pairs of contraries 'drawn from the same table' or pairs of contraries 'at the same remove' from the good and the bad. The thought here is that the table of opposites is headed by the most generic pair, the good and the bad, and each column has a list of items that are at some remove from the most generic pair. If you take an item from one of those columns as your principle, then you will take the item from the other column that is at the same position as your other principle. This observation tells us something about the way that the Presocratic philosophers were searching for contrariety, and why the ones who chose items higher up the table in the direction of greater generality were 'more on the right lines' (125,10).

Further comments relating to the Presocratics in general, and to Aristotle's predecessors more widely, are made in section 10 of this



work, discussing the passage at 191a23-b35 where Aristotle diagnoses in what respect the ancient thinkers went wrong, particularly in relation to the old doctrine that nothing comes from nothing. For Aristotle, and for Philoponus too, the main purpose of this diagnosis is to explain the advantages of the Aristotelian solution, which invokes the notion of privation (although Philoponus himself will go on to question that principle even for matter in the final section, discussed below). Although the suggestion that the Presocratic project was generated as a result of philosophical confusion about the language of ‘nothing’ and ‘non-being’ is an important one, there is nothing specific of interest to the scholar of Presocratic philosophy in this section of Philoponus’ commentary.

#### 4. Controversy and originality

Philoponus’ commentaries are not merely meant to report and explain Aristotle and the other thinkers whom Aristotle is discussing. They are also the philosophical work of an independent thinker in the Neoplatonic tradition. Philoponus has his own, sometimes idiosyncratic, views on a number of important issues, and he sometimes disagrees with other teachers whose views he has encountered perhaps in written texts, and sometimes in oral delivery. A number of distinctive passages of philosophical importance occur in this part of Book 1, in which we see Philoponus at work on issues in physics and cosmology, as well as logic and metaphysics.

One such passage is the discussion of the difference between privation and negation on pp. 119-120 of this commentary. Philoponus appears initially to be making a merely lexical observation, that some forms have well-formed privation words in Greek much as we have privative words formed with prefixes such as ‘un-’, or ‘in-’ or ‘dis-’. In Greek the form is composed by negating the term for the form (e.g. *sunthesis*, meaning composition) using an alpha on the front (creating a term such as *asunthesia*, meaning non-composition). Other words, by contrast, do not have a term for the privation in common usage, and instead you have to put ‘*ouk*’ on the front, meaning ‘not’ or ‘non-’. Philoponus suggests that we have proper privative terms for what he calls the substrate, which here seems to mean the state of the matter and in particular its generic state of composition or non-composition,<sup>14</sup> but that we do not have proper privative terms for the negation of the particular forms, although we do, in most cases, have a definite name for the positive form. That is, one can say (of the substrate) that harmony emerges from disharmony, and decays into disharmony again, but when we are speaking of specific forms, if the form that emerges is, for example, the form ‘horse’, then what it emerges from is a lack of the form of horse (non-horse), and it is into that lack that a horse decays on losing the form too. This one does not have a special privative name.

The point is about the range of privative vocabulary in Greek. But it leads into the more important claim that such privations, the specific privations of specific forms, are not interchangeable in their explanatory role. That is, although there is a sense in which the non-horse from which the horse develops is also not a stone, the horse is not said to develop from non-stone in the way that it is properly said to develop from non-horse. Forms are to be thought of as developing from their own specific privations, not from the privation of some other irrelevant form. What changes, to become something, first lacked that form and then gained it. To specify some other form that it lacked, and which it did not then go on to acquire, is not any part of the explanation or characterisation of that process of becoming. So, Philoponus urges, becoming is always from the contrary, namely from the exact negation of the very form that is then acquired, the privation that is in this sense 'proximately antithetical':

For the composition of a house develops out of non-composition and the order of a military camp develops out of disorder, and similarly also what is shaped, like the statue, develops from the shapeless: and these are not just any disharmony, non-composition, disorder or shapelessness, but the ones that are proximately antithetical to each composition or harmony or to one of the others. For that of the ship or of the statue would be a non-composition as compared with the composition of the house; but it would not be possible for a house to develop from that. So there must necessarily be *some* determinate non-composition from which the house <emerges>, at least broadly, even if not relative to an individual. Except that not even here is it simply from any old privation, but there is some individuating privation or indeed a certain contrary, out of which it develops and into which it decays. (*in Phys.* 120,23-121,2)

The point is that non-human can refer to anything that is not human, but here we need to narrow the meaning down to refer to the prior state of something that has the potential to become human, and more precisely than that, to the very state that immediately and proximately gives rise to the development of the positive form. Philoponus has taken us beyond what Aristotle says to flesh out in more detail the ontology of privation and form, and the items needed to address issues about the explanatory role of privation in accounts of change.

This issue is further developed in the interesting parenthesis at 122,3-18, where Philoponus discusses in what sense vice is opposed to virtue and ignorance to knowledge. On the one hand, Philoponus says that vice and virtue are not contraries. They are not opposed to one another except as privation and presence of the form. They are not contraries, because that would imply that both sides of the contrast

were determinate, whereas in the case of vice and ignorance there is an indeterminacy about what form the absence of virtue, or the absence of knowledge, takes.<sup>15</sup> Just as various kinds of curve can count as *not straight*, so also various kinds of failure to be virtuous can count as *not virtuous*, or various misconceptions can count as *ignorance*. One might think that virtue and knowledge were likewise similarly indeterminate, in that there are various specific *ways* of being virtuous or knowledgeable, but that is not exactly the point of the indeterminacy of vice. It seems rather that for any item of knowledge, or any particular virtue, that specific virtue has several (or indeterminately many) ways of missing it, whereas, presumably, there is only one fairly specific way of *having that virtue*, or *knowing that thing*. In addition the privation of knowledge can take the form of either various distorted opinions, or (in the case of those not yet old enough to have a view) it can take the form of having no opinion at all. All these reflections on the details of explanations in terms of privation, which go beyond what is in Aristotle's text, seem to be the work of Philoponus in extending the hints given in Aristotle's work.

At page 129,7, where Philoponus is engaged in introducing the section we have called Section 5 in this book (which relates to Chapter 6 of Aristotle's text, 189a11-20) he addresses an issue relating to Aristotle's claim that 'for each class there is one most generic contrariety'. He observes that scholars raise three questions about the meaning of this claim:

Scholars ask, at this point, first what Aristotle means by '*genos*' (class) here; second, in what way 'there is one contrariety in each class'; and third whether the discussion here applies to all change, or rather – if it is about the most widely shared principles of all natural things together, but the other categories too, not just substance are natural things – how come Aristotle thinks that by finding the principles of substance he has found the principles of all the things there are. (*in Phys.* 129,7-12)

One might think that the scholars in question should perhaps include Themistius, since at 135,25, in the very short section of textual analysis relating to this part of the work, Themistius is named as one who had a view on what Aristotle means by '*genos*',<sup>16</sup> which is the first question mentioned here. However, in fact, the exegetes seem to be scholars who argue *against* the view of Themistius, since he seems to be the one whose view (that '*genos*' means what is predicated of several species in the substance category) is being rejected by those 'exegetes' whose analysis is up for discussion here. So we must suppose that the 'Exegetes' or commentators were not the written authorities such as Themistius, but perhaps other more recent or living philosophers with current and rival views on issues that Philoponus is currently working on.

The puzzle that Philoponus is addressing, in connection with this passage, is how Aristotle's argument is sufficient if it merely relates to the category of substance, since Aristotle seems to think that he is in search of the principles of all things, not just those in the category of substance. If *genos* is a class of substances (the class which is predicated of several species in the category of substance) then the argument will apply only to that category and not the rest. The exegetes then try to rescue the argument by taking '*genos*' in another sense. The sense proposed (by these thinkers) is that it refers to the substrate, not to a class of substances. This is then taken to be what underlies the form / privation exchange, and hence counts as a principle of all things. The solution to the problem seems somewhat specious, but was clearly a route that recommended itself to exegetes committed to showing that even if what Aristotle said looks to be badly expressed, a little ingenuity will yield a satisfactory sense. Philoponus moves from reflections on this 'substrate for the differentiae' sense of 'class' to observe, in his own voice, that once one has taken it in this sense, one can still use the word 'class' (or '*genos*') even for the species (or specific form) despite the fact that in another sense of '*genos*' it is contrasted with species and applies only to the generic, not the specific, class of things.

At 133,17 Philoponus embarks on the treatment of a further argument, to be found at 189a17-20, relating to the idea that the principles (or *arkhai*) of natural things are reducible to a single pair of contraries.<sup>17</sup> He says:

In addition to these, Aristotle offers a third attempt by showing that the principles are not infinite. It is as follows: if (p) some contraries are prior to others, he says, and the principles need to last for ever, then (q) it is absolutely essential that the principles be not only finite in number but also not more than two. But p; therefore q. (*in Phys.* 133,17-21)

Philoponus proceeds to look more closely at this argument. In particular his attention is drawn to Aristotle's claim (in the proposition p) that the principles 'need to last for ever'. What are these principles and what is this idea about them *lasting for ever*?

Philoponus knows of three rival explanations of what the point might be. It is not clear whether these rival views had appeared in published commentaries or whether they were opinions offered in live debate, but Philoponus addresses them one at a time. The first suggestion is that the principles in question are celestial things and the reference is to Aristotle's ideas about the eternity of the heavenly bodies:

But let us investigate, in this inference, firstly what exactly it is for the principles to last for ever, and secondly how the antecedent will come out true. Some people think that by 'principles' Aristotle

means the celestial things, and that these are eternal. (*in Phys.* 133,21-4)

Our ears prick up at the mention of a possible reference to eternal heavenly bodies, since this is one of the areas on which Philoponus sometimes expresses his disagreement with Aristotle.<sup>18</sup> But here Philoponus is not going to be drawn into that controversy. Instead he dismisses the issue, on the grounds that this topic simply cannot be what Aristotle is talking about at this point.

But the discussion here is not about the efficient cause, but the formal cause, so he is not talking about celestial things. (*in Phys.* 133,24-5)

How exactly this counts as an objection (and why the mention of heavenly bodies would be to invoke the efficient cause) is not immediately relevant to our purpose. We should simply note the confidence and brevity with which he rules out one tempting, but clearly unsatisfying, thought from the existing literature on this passage.

Next he turns to another suggestion that looks as though it may be Platonist in origin. It appears to record an attempt by other commentators to locate Platonic forms in Aristotle's text at this point:

Others say that by 'principles' he means the forms prior to the many: given that these permanently exist, they say, it is in this way that things down here come into being. (*in Phys.* 133,25-7)

The 'forms prior to the many' are presumably the Platonic forms, which are distinctive for the fact that they are independent and logically prior to any instances of them in physical things. The 'many' here refers to the plurality of particulars. The Form is the one form in which all the particulars participate. But for Plato the form is prior and eternal, whereas the particulars are temporary instantiations of it. For Aristotle, by contrast, forms are not prior to or independent of particulars, but are inseparable except in thought from the instances of them. If forms are to *last for ever* in Aristotle it will have to be because they are permanently instantiated, not because they exist independently of the particulars as they do for Plato.

So it looks as though Philoponus is alluding here to an existing interpretation in which someone has tried to saddle Aristotle with eternal pre-existent forms of a Platonic kind, on the basis of this passage in which the principles are said to be everlasting. The reference to 'things down here' (*entautha*), in this rival commentator's interpretation, suggests that the interpretation locates the eternal forms in another world, a heavenly realm of separated forms, and the particulars 'here', in this world, as it were, by contrast with that other realm.

Philoponus, however, has no time for such fantasies, despite his Neoplatonist inclinations. He proceeds to dismiss the proposed interpretation on the grounds, first, that it conflicts with Aristotle's known commitments, in respect of 'forms prior to the many':

But this is not true either. For firstly, Aristotle does not want there to be forms prior to the many ... (*in Phys.* 133,27-8)

So Philoponus places overriding importance on the need to preserve the Aristotelian position on forms. That requirement disqualifies any interpretation that assimilates Aristotle's views to Plato's, at least on this issue. In this respect he is following principles that we would recognise as proper to scholarly exegesis, by trying to avoid reading one's own views into the work of others at too great a cost in authenticity.

Secondly Philoponus offers a reason (besides mere authenticity) against reading the forms into this passage, a reason based on the philosophical point that is being made. It cannot be about forms, he claims, not just because Aristotle did not hold with 'forms prior to the many' but also because 'forms prior to the many' would not serve the purpose that is intended here. This is what he says:

Secondly he is talking about principles that are opposed and that mutually act upon and are affected by each other, and which by their presence or absence effect creation and destruction. But the forms prior to the many are not like that. (*in Phys.* 133,29-31)

The point here is that the claim that 'the principles need to last for ever' is part of a double premise in an argument about the number of principles required to explain things. It is an issue about *formal causation*, as Philoponus will go on to remark in the next bit (to which we shall come in a minute). The reference to 'creation and destruction' here in this passage is to the idea that the *presence* of a certain necessary and sufficient condition makes a thing the thing that it is; the *absence* of that condition makes it *not* that thing. So that, in cases of change such as coming to be and passing away, a thing counts as *having become x* if and when it has the necessary and sufficient condition for being *x*, and it *ceases to be x* when it loses that. It appears that those necessary and sufficient conditions are what are here called 'principles', and the issue is *how many such principles* we are going to need in order to explain the logic of change.

It now becomes clear why one might think that the Platonic forms should do the job. The idea that the Form is explanatory in accounting for the identity of things is familiar from Plato, and features in the notion of 'Forms as causes' in the *Phaedo* (for instance).<sup>19</sup> The idea there is that for something to be large (say) it is both necessary and sufficient that it have *largeness* in it. If it has that form, it is large. If it loses that form, and takes on another – say smallness –, it has ceased to be large

and become small instead. The formal cause that makes a thing the thing that it is can thus be integrated into an account of change. We can account for how things turn into other things (as and when they acquire or lose the forms that make them what they are) by appealing to the *presence* or *absence* of the relevant form, although such an account does not offer any account of *why* or *how* they acquire or lose those forms. It is, as we might say, a purely formal account of the logic of change, and makes no distinction between alteration and mere Cambridge changes, such as when some description ceases to be true of an object due to alteration in a different object.

This makes it easier to see why a Platonising commentator might introduce the idea of forms at this point. Indeed there is some similarity between the tasks that the Platonic forms have to perform, in that analysis of change, and the task that Aristotle is addressing in this passage, even on Philoponus' own interpretation. But Philoponus attacks the idea, on the basis that *those forms*, the 'forms prior to the many', are not conceived as opposites in the way required for this argument. The 'forms prior to the many' are the forms of different *kinds* of things, universals if you like. Aristotle, however, is looking at the idea of contrariety among the principles, and although in our chosen example of large and small the change seems to involve contrariety among forms, that is not typical. In ordinary cases of change there is no systematic structure of oppositions determining the forms that can succeed each other. Seeds become trees and leaves become yellow and orange and red. By contrast, Philoponus insists, Aristotle is looking for principles that are inherently and essentially conceived as contraries, while also explaining the development or destruction of a thing by their presence or absence.

As we have seen, that second condition is true, or would be true, of the 'forms prior to the many'. For the Platonist too, the presence of the form makes the thing what it is, and the absence of that form is part of the explanation of why it is no longer what it was. Philoponus is more concerned with the first condition, the notion of contrariety among principles, and with the idea that the contraries mutually act upon each other.<sup>20</sup> It is this feature that he thinks is crucially missing from the analysis in terms of Platonic forms, and is provided correctly by the notion of *form and privation*. These two points, the contrariety of the principles and the expectation that they should act upon one another, are thus taken to undermine the claim that the principles that 'need to last for ever' might be supposed to be the Platonic Forms.

Philoponus now proceeds to a third option, which will also turn out to be unsatisfactory.<sup>21</sup> This time the suggestion is that the principle in question is something like matter:

Others say that he means what is extended in three dimensions: for this stays for ever due to being immutable. But this is not true



either. For the discussion is about formal principles, but this idea impinges more upon a discussion of matter, not a discussion of form. (*in Phys.* 133,31-134,2)

Here again our ears prick up at the mention of 'what is extended in three dimensions', because this too (like the first issue of the eternity of the heavenly bodies) is an area in which Philoponus has a particular interest, which emerges in at least some of his writings. It is usually held that only later in his career did Philoponus develop the idea that the ultimate substrate of things is *three-dimensional extension without matter*, as opposed to the prime matter that he took Aristotle to be placing in that role.<sup>22</sup> I have argued elsewhere that we can find the origins of this idea already present in Book 1 of the *Physics* commentary (and that we do not need to posit a second redaction of the work to explain its presence there).<sup>23</sup> The issue is a matter of some controversy, and this passage deserves attention for that reason, as well as for its intrinsic interest as an example of Philoponus' method of work.

The debate about prime matter and the place of the three-dimensional is connected with the debate about the creation of the world, because there is an issue as to whether creation presupposes the prior existence of prime matter (existent from all eternity), or whether the matter comes into being at the same time as the bodies that that make up the world. That issue has also been broached earlier in the same book of this commentary, although Philoponus does not endorse a settled position on the question.<sup>24</sup> Here however, at 133,31, Philoponus refers to 'others', apparently not himself, who find a hint of the notion of *three-dimensional extension* in the reference to principles that 'need to last for ever'. The thought must be that *three-dimensional extension* is not created but exists in perpetuity, as the substrate for the things that come to be, and hence serves as an eternal *arkhê*, one of the ultimate explanatory factors in the generation of things. According to the unspecified interpreters who make this suggestion, the three-dimensional 'stays for ever, due to being immutable'.

Philoponus' objection to this thesis is not that its proponents are mistaken *about the role of three-dimensionality as a substrate for change*; that he actually seems to grant. Rather, he objects that it *cannot be what is meant in this passage*, since the role of the three-dimensional is a role we associate with explanations of the material-cause type. We would be specifying the *stuff out of which* things came to be, which at its most basic is mere extension. But, Philoponus observes, Aristotle is not currently engaged in that sort of enquiry, but is rather investigating the *formal* principles of change. For this purpose, mentioning a substrate or stuff from which the thing emerges is not a solution. In other words, he does not necessarily want to reject such an analysis of the relation between matter, creation and three-dimensional



extension in itself, but he thinks that it cannot be a correct explanation of what Aristotle is saying *at this point*.

Who are these 'others' who appeal to the idea of three-dimensionality at this point? No names are given for these, nor for either of the earlier exegetes. There is no evidence of this debate at all in Simplicius' commentary. Perhaps we might be tempted to conclude that there must have been someone other than Philoponus himself seeking possible references to three-dimensional extension as a basic substrate for creation. Or we might conjecture that there were perhaps students in his class who were toying with such a reading, and that the finished commentary records something of the dialectical debate in Philoponus' Aristotle reading group over one or more years of work. However, we must also consider the possibility that these erroneous ideas are in fact not the ideas of other opponents, but rather ideas that Philoponus himself had invented and explored, before deciding that they were not plausible for the reasons given here. For, as we shall see, it looks as though he was himself the one who had once thought that the principles that last for ever must be the forms prior to the many.<sup>25</sup>

So in this passage, once again, we find that Philoponus' criterion for accepting or rejecting a proposed reading of the text is not whether he himself agrees with the metaphysics that it presupposes, nor whether Aristotle might be thought to agree with the metaphysics, although in the case of the Platonic Forms that does figure as a limiting factor. Fundamentally, however, what matters for Philoponus is whether it makes good sense of the direction of Aristotle's argument in the passage.

Finally, at 134,2 Philoponus turns to his own answer to the puzzle about the reference to an everlasting principle, introducing this (as he usually does) with the phrase *phamen oun hêmeis* ('Well we say ...'). The solution is a therapeutic deflation of the whole issue. Effectively, he suggests, we should never have seen here any reference to eternity, or to existence from before creation. Rather the phrase *aei dei menein* ('needs to last for ever') is not to be taken temporally, but rather as a reference to the *omnipresence* of the principles in question. Here is what he says:

My view is that the phrase 'last for ever' here means, for Aristotle, being found in every change and every change occurring on the basis of these. (*in Phys.* 134,2-4)

That is, the notion expressed by *aei*, 'for ever', is not permanence but merely invariability: these principles are supposed to be principles of every change. There must be no changes that do not involve these as explanatory. Philoponus goes on to explain this idea by means of an analogy: suppose we were looking for the common material cause (the thing out of which everything is made) and someone suggested that it

was wooden timbers, we'd reject the suggestion because there are some material objects that are not made out of wooden timbers.<sup>26</sup> So similarly in this case, although we are not looking for a common *matter*, we're looking for a *formal* principle that meets the same demand, namely that it must invariably occur as a factor in all natural things, and where it occurs it must be explanatory. That is all that is meant by *aei dei menein*.

Effectively Philoponus has deflated the significance of a phrase that might look superficially inviting to a Neoplatonist, or indeed to a Christian Neoplatonist interested in questions about the eternity of the world. Instead of indulging in the activity of reading his own views into the sentence, or using it as an excuse to hang a discussion of the origin of the world, or to challenge his rivals about the nature of creation, Philoponus proposes a minimalist interpretation, which eliminates the tempting hints at eternity or at metaphysical entities prior to creation. This sentence is not, after all, about eternity; it is about regularity. The elaborate interpretations canvassed above are all wide of the mark, and can be dismissed without entering the controversy to which they belong at all. They can be dismissed simply because they do not make sense of the philosophical point that Aristotle has to be making here.

At least, this is what we would conclude if we stopped reading at p. 134. But there is a coda to this passage. For right at the end of the book Philoponus makes some further remarks on this topic, and what he says there seems to be incompatible with what he has said in the passage we have just been discussing. 'So Aristotle too,' he says, 'in accordance with Plato, knew the forms that are separated and transcendent and causes of the ones down here, and it was not in vain that we said earlier that when he used the phrase "the principles need to last for ever" he was referring to these forms' (193,1-4). Clearly Philoponus is referring back to the earlier passage when he says 'we said earlier that ...' but what he says here, about what he said there, appears to be the opposite of what he actually did say there. For in the earlier passage which we have just reviewed he argued *against* the view that 'the principles need to last for ever' should be read as a reference to the transcendent forms. Here by contrast he says that we did take the phrase to be a reference to the transcendent forms and we were right to do so – as if he now endorses one of the erroneous readings that he spent several pages rejecting in the earlier passage, particularly in the paragraph at 133,25-31. Not only does he here endorse it, but he seems to think that we endorsed it there.

What are we to make of this contradiction? One option is that Philoponus did once hold that view, and wrote an earlier version of the commentary (or gave an earlier version of his seminar course) in which he advocated that reading over the alternatives, and tried to read Platonic Forms into Aristotle in several places, including both 192a34 and in the earlier passage at 189a19-20. On that hypothesis we should

suppose that the passage at 133,25-31 has been radically revised so that it now attacks the view that Philoponus himself had once held, and attributes it to unnamed 'others', while the passage at 192-3 has not been revised and still maintains, in Philoponus' own voice, that Aristotle was a Platonist about Forms, and still cross-references to an earlier discussion, despite the fact that the earlier discussion now argues for the opposite conclusion. Another option is that he has himself forgotten that he only toyed with, but eventually rejected, the Platonist reading of the earlier passage, perhaps because he prepared the last lecture of the course before he actually delivered the earlier lecture (during which perhaps he modified his view in the light of re-reading the text with his students). A third possibility is that the commentary is based on students' records of a live debate and is not accurate in identifying which view was actually proposed definitively by Philoponus in his own voice.

Whichever hypothesis we adopt it does seem clear from the mismatch between these two passages that some of the views attacked in the commentary are Philoponus' own suggestions, or suggestions from within his school, whether they were his own views developed at an earlier stage of his own philosophical progress, or were straw men developed for dialectical discussion in the seminar. It also suggests that the sober, sensible, deflationary Aristotelian Philoponus whom we have encountered in the best bits of this commentary may be a later persona, less extravagant in his interpretations, and that only one or two small passages still reveal that there was once a period in which Philoponus had been more adventurous in his Platonism and more inclined to attempt to read Aristotle as holding Platonic views, and as hinting at them in the wording of certain key phrases in the *Physics*.

## 5. Matter and creation

As we have noted above, the key areas in which we expect Philoponus to have something challenging to say are in respect of the creation of the world and the pre-existence of matter or three-dimensional extension. Three further passages are worth attention in this respect.

The first is 138,21 where Philoponus is considering why Aristotle says that the substrate is prior to form in substantial entities. One is inclined to reject this view on the grounds that there can never be matter without form (138,20). Philoponus makes us think again, by suggesting that although it is true that there can never be matter without form, still there is a sense in which matter is naturally prior to form. 'For it co-destroys but is not co-destroyed' (*sunanairei kai ou sunanaireitai*, 138,22). In other words, if the matter is destroyed the form is also destroyed at the same time (matter co-destroys the form), but if the form is destroyed the matter can survive (matter is not co-destroyed). We can also mentally think away the form and conceive

of matter without any other substrate to support it, but if we try to abstract the form in thought, we can only think of it with the matter as substrate, even in thought.<sup>27</sup> This much seems to be founded on Aristotelian principles. The next thought, however, is more characteristic. 'If God created things bit by bit, what would he have established in advance?' asks Philoponus. It's a hypothetical question, which does not commit us to saying that there was a god and he did make the world bit by bit and he did start by making matter in advance of giving it form, so there is nothing here to suggest that Philoponus is assenting to a creation story. But it suggests that we engage in a thought-experiment about what such a god would do, were he creating the world. He would surely create the matter ready to receive the forms, not the other way round.<sup>28</sup>

At 189,10, on the other hand, Philoponus appears to say that matter is uncreated (or without beginning, *agenêtos*). He is commenting on the passage from 195a25 to 195b4, where Aristotle says that in one sense the matter is created and perishes, and in another sense it does not come into being or perish. Although Philoponus concedes that Aristotle is engaged in showing that matter is uncreated and imperishable, he makes a distinction between temporal and causal uncreatedness, and he argues that Aristotle means only that matter has no beginning in time, not that it has no causal origin. He appeals to resources both inside and outside the present text to support this claim, citing first two texts from elsewhere in Aristotle (the *De Caelo* and *Metaphysics* Book Lambda) which appear to say that everything is dependent on an external source, the first cause. He then turns, at 189,17 to showing that the text he is currently commenting on is about temporal becoming. Aristotle says that if matter were to come into being something would have to be there *first*. This leads to absurdity, and hence it is ruled out, but if the absurdity is that temporally there must be something there first before the thing that supposedly forms the preliminary substrate, this suggests that Aristotle is ruling out temporal creation and wants to suggest that matter has no temporal beginning. However, this does not mean that it is without cause, that it does not depend upon something for its existence. There is, thus, scope for it to be created, in the sense of being causally dependent upon a creator, but not created *in time*.

Philoponus continues to explain Aristotle's reasoning in support of the idea that matter must be uncreated and indestructible. It is, he suggests, based on an axiom to the effect that nothing whatever develops from absolute and utter non-being. But, says Philoponus at 191,10, suppose there is someone who does not agree with this axiom. Indeed, he argues, Aristotle himself is not really committed to this axiom for every case, because he must in fact grant (Philoponus believes) that forms arise out of absolute and utter non-being, when they supervene upon a mixture.<sup>29</sup> Forms do not exist somewhere before they come to be

in the world. They just appear, without any prior material instantiation. When we tune an instrument the tuning does not exist somewhere first, before we tune the instrument. It is a new item which is added to the stock of reality at the point at which the instrument is first tuned. So also the forms are not already in the stock of real things. They do not emerge from a previous material substrate. And if this is so, then it is not in fact true that nothing comes into being from nowhere.

It is not clear from this or the earlier passage<sup>30</sup> whether Philoponus holds that the forms are made by God, and imposed on the material mixtures by the Creator. These passages are couched in impersonal terms and refer to the mixtures being 'suitable for receiving the forms' without much indication of what is the factor that selects which form will supervene. At 191,24 Philoponus compares the process to a technician tuning an instrument, and concludes 'so it is also in the case of the mixture of animals' bodies. For the lives are added from without to the suitability of the mixture, by the creation.' This invites the idea of an intelligent creator imposing the forms on matter, but stops short of actually mentioning such a god. Neither here, nor in the parallel passage in the commentary on *De Generatione et Corruptione*, does Philoponus ascribe the task to God or imply that God creates the Forms.<sup>31</sup>

This passage hints not just at Aristotle's implicit rejection of the axiom he is using to generate the conclusion that matter is uncreated, but more strongly still at Philoponus' own rejection of that axiom. He thinks Aristotle is not committed to it, because Aristotle's account of the supervenience of forms is incompatible with it. But Philoponus himself does not seem to think that supervenience is an impossible account of the development of souls and forms, so it appears that the point is not merely *ad hominem*. He is himself a doubter. He does himself think that the claim that matter is uncreated rests on a faulty axiom that not even Aristotle really accepts. So although he has already preserved the possibility that matter might be causally created (but not in time) here he implies that there is scope to doubt whether it is even temporally uncreated either. At 192,1 he drops the topic for the time being, but he clearly implies that more could be said on it.

## 6. Progress in philosophy

Philoponus clearly thinks that philosophy did not stop with Plato and Aristotle, but that he himself can make some contribution to its progress, even though his procedure takes the form of commentaries on an existing canonical text. We should close by noting his own comments on the way in which philosophy makes progress by building on the foundations laid by earlier thinkers:

But it is no surprise if Plato does not explicitly say, in so many words, that the privation is conceptually distinct from the matter,

as Aristotle does. For Aristotle himself is the one who says that we would not have been in a position to have such articulated knowledge about objects, if we had not obtained the principles and seeds of the enquiry from the ancient thinkers. (*in Phys.* 184,8-12)

Here Philoponus is commenting on the fact that Plato did not sufficiently articulate the distinction between the matter out of which something comes and the privation which is replaced by the form when it develops, a distinction that Philoponus has just been exploring over some pages. Was this a mark of failure on Plato's part? Not really, replies Philoponus. For Aristotle himself was aware of his debt to his predecessors, who had sown the seeds and established the first principles. This explains why Aristotle is able to improve over Plato, even though Plato is himself a great thinker.

This much seems simple. It explains why a Neoplatonist reveres both thinkers, even though in the Neoplatonic Schools of study we are likely to start our school study as beginner students with the study of Aristotle's physics (which deals with the more straightforward and earthy matters) and work on Aristotle as a preliminary to the more advanced study of Plato. Plato can still be our guide on the highest matters of intellectual insight, even if in many areas Aristotle is able to give more precision and articulation to the work that Plato began.

In addition Philoponus moves on to consider his own role as commentator.

And it is no surprise that we ourselves extend and add precision to the work received from those others who gave us the starting points of our knowledge of things. (*in Phys.* 184,12-14)

That is, the teacher or student in the Neoplatonic School is to envisage that there is still a task to be done and that his task will not just involve 'adding precision' or articulating previous knowledge handed down by the great thinkers, but also 'extending' it, *platunein*. The predecessors gave us the starting points (*aphormai*) from which we start the progress towards knowledge, but there is still work to be done. We should surely take this as a statement of what Philoponus understands his role to be, and how he envisages his relation to the work of Plato, Aristotle and the rest of the ancient philosophers in the canon.

## Notes

1. Not all of Aristotle's work begins in this way, although the *Physics* and *Metaphysics* famously do. In fact it may be better to read Aristotle's choice of this approach as a way of undertaking a sketch of the territory (for instance: what philosophical theories are available as options?) rather than a historical survey of the positions that happen to be adopted. This, at least, is how Philoponus interprets it.



2. The Eleatics do not qualify as philosophers of nature because they question the first principles of nature. They are discussed in Chapters 2 and 3 for their intrinsic interest as thinkers who challenge the very basis of natural philosophy, but they are not among the predecessors in the field that is to be addressed in Aristotle's *Physics*. On this issue, and on Philoponus' commentary on the relevant chapters see the introduction to my earlier volume, Catherine Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle: London: Duckworth, 2006).

3. See Philoponus in *DA* 424,4.13.

4. See Philoponus in *DA* 121,10; 124,25.

5. This happens at 90,5; 101,29; 125,15; 148,19; 158,9; 163,13; 192,17; see also Catherine Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3*, at 7.

6. e.g. 93,17; 94,5.14; 95,12.25.

7. in *Phys.* 96,8-10, referring to *Physics* 187b7-13.

8. Whether it is strictly correct that it is *ad hominem* is doubtful, since it presupposes that what is infinite in number cannot be known. This axiom might be disputed by Anaxagoras, and could therefore count as a matter of external fact, not internal to Anaxagoras' own position.

9. Here Philoponus sketches approximately the same account of the relation between material mixture and form that he will describe again at the end of this volume, 191,11-25, and in some other texts (in *GC* 169,4-27; in *DA* 51,13-52). See further below.

10. in *Phys.* 99,9.

11. This axiom does not conflict with the thought that bodies are infinitely divisible, nor with the thought that some measures are incommensurable (such that the same unit does not divide both magnitudes). It simply claims that if one is not constrained to use units of a certain size, one will always find some finite unit that measures the whole, with no remainder.

12. See Andreas Van Melsen, *From Atomos to Atom: The History of the Concept Atom* (Pittsburgh: Duquesne University Press, 1952) on the development of the idea of minimal parts from the commentators to early modern atomism. It appears, from Simplicius in *Phys.* 170,9, commenting on the same text in Aristotle, that the idea of minimal parts in Aristotle goes back to Alexander.

13. These are mentioned later by Aristotle, though without Empedocles' name attached, at 188b34, where Philoponus correctly assigns them to Empedocles.

14. Philoponus speaks of harmony versus disharmony as well as composition and non-composition. It is apparent from the next section of the commentary at 120,20 that the reference to harmony is to musical harmony and will be cashed out in terms of the specified tuning of the strings of a lyre for a particular genre of music, as opposed to the preceding tuning which may be well-tuned for another purpose but is untuned as regards the required set of notes.

15. Philoponus' thoughts about the indeterminacy of vice may be prompted by Aristotle's reflections on this subject (see *Nic. Eth.* 1106b28-33), but Aristotle does not himself draw the parallel with knowledge, at least not there.

16. As explained above (section 2) Philoponus divides his commentaries into sections. Each section contains a long expository section followed by a series of shorter comments on brief lemmata from the passage just discussed. The material just discussed comes from the first part of section 5 of the present volume, while what follows is from the second part.

17. Two earlier points have been identified, one of which is the idea that

earlier thinkers thought in terms of contraries (section 4 of this volume). The second is the argument just treated (189a11-17) in which Aristotle dismisses the two extreme options (that there is just one principle on the one hand, and that the principles are infinite on the other hand) and thereby concludes that it is preferable to go for a finite plurality. Philoponus is now addressing the third argument, to be found at 189a17-20.

18. For at least part of his life Philoponus held views on the creation of the world that conflicted with Aristotle's. In those works that promote a Christianising version of Neoplatonism, Philoponus argues for creation *ex nihilo* in time, whereas Aristotle's notion of a fifth element in eternal motion does not even allow for the creation of the world in time, let alone creation *ex nihilo*. See Philoponus *Contra Aristotelem*, translated by Christian Wildberg in *Philoponus: Against Aristotle on the Eternity of the World* (Ancient Commentators on Aristotle: London: Duckworth, 1987). Scholars disagree on when and how radically Philoponus changed his view on these matters. The *Physics* commentary appears to show evidence of some revisions between an earlier and a later version, but there have been several attempts to refute the extreme chronology suggested by Koenraad Verrycken, 'The Development of Philoponus' Thought and its Chronology', in R. Sorabji (ed.), *Aristotle Transformed* (London: Duckworth, 1990), 233-74. See my own introduction to the first part of the *Physics* commentary, Catherine Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3*; Frans de Haas, *John Philoponus' New Definition of Prime Matter* (Leiden: Brill, 1997); and a forthcoming chapter by Sorabji in Richard Sorabji (ed.), *Philoponus and the Rejection of Aristotelian Science* (2nd edn, London: Institute of Classical Studies, 2008), which sets out the current state of the controversy. On creation *ex nihilo*, for which Philoponus does make provision occasionally in at least the final redaction of this text, see further below.

19. *Phaedo* 99D-102B.

20. This idea is also slightly odd, since it is not clear that form and privation act on one another as opposed to merely taking turns to characterise the things to which they belong. Equally one might trace a very similar idea in the *Phaedo* where the approach of an opposite and incompatible form drives out or destroys the existing form in an item such as the tall Simmias or the cold snow (*Phaedo* 102B-105B).

21. 133,31-2.

22. See Verrycken, 'The Development of Philoponus' Thought and its Chronology', in R. Sorabji (ed.), *Aristotle Transformed* (London: Duckworth, 1990), 233-74.

23. Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle: London: Duckworth, 2006), at 9-11.

24. 16,25-30; 54,10-55,26. See Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle: London: Duckworth, 2006), at 11-16.

25. See 193,1-4, discussed below.

26. Philoponus *in Phys.* 134,4-8.

27. This thought-experiment seems to be inconclusive, since it seems that we would need to be shown not that we needed another substrate for matter but rather that we could genuinely think of it without a form of some sort. The idea that form evidently cannot exist without matter, even in thought, also seems somewhat un-Platonic. But evidently we are thinking here not of transcendent forms but of Aristotelian forms, the form part of hylomorphic substances, which is further evidence that Philoponus has eschewed the temptation to think in terms of Platonic Forms.



28. Again we might think that the thought experiment would be less than clear to one who supposed that the forms existed eternally in a separate realm waiting to be instantiated in matter, as a Platonist might do. For such a Platonist believer the expectation might be that a god who created bit by bit might start by creating the world of the forms, and then do as the *Timaeus* demiurge does, by creating a likeness in matter of a world that was there already as a form. So the very fact that Philoponus takes the answer to his question here to be obvious, that matter would come first, shows how un-Platonic are his assumptions in this commentary. He is not trying to reconcile Platonism with Genesis, though he may be trying to re-interpret Aristotle as essentially compatible with Genesis.

29. This analysis of the supervenience of forms on material mixtures continues and develops the thoughts sketched at 97,24-30. In other texts Philoponus is similarly concerned to show that forms supervene on suitable mixtures, although they are not determined by the formula of the material mixture (they are not the *result* (*apotelesma*) of the mixture). Rather a *suitable* mixture is required, but which form supervenes is not a foregone conclusion. Here the important move is his explicit assertion that the forms do not come in from somewhere else: that they do not pre-exist elsewhere. Rather they come *out of nothing*. For this reason I think it is not correct to translate 191,15, with Sorabji, 'from outside, from the universal creation' (Richard Sorabji, *The Philosophy of the Commentators 200-600 AD: A Sourcebook*, vol. 1: *Psychology (with Ethics and Religion)* (London: Duckworth, 2003) 201) as though there were a pre-existing world of forms, but rather 'from outside of the entire creation', since we are immediately told that this is a genuine case of coming into being *ex nihilo*. The same phrase occurs at *in GC*, 169,7. See also above note 9.

30. 97,23-98.5; 191,11-29.

31. For the contrary view see Richard Sorabji, *Emotion and Peace of Mind: From Stoic Agitation to Christian Temptation* (Oxford: Oxford University Press, 2000), 266-70, and Richard Sorabji, *Time, Creation and the Continuum* (London: Duckworth, 1983), 249-52, tracing this idea to Christian thinkers, including Origen. Sorabji finds this sense in the text because he reads the reference to *hê holê dêmiourgia* (at 191,15) as equivalent to 'the Demiurge's universal creation'. However, there is no word for 'the Demiurge' in either of Philoponus' texts.

## Textual Emendations

The translation in this volume follows the text printed in *CAG* vol. 16, *Ioannis Philoponi in Aristotelis Physicorum Libros Tres Priores Commentaria*, ed. H. Vitelli (Berlin: Reimer, 1887), but note the following deviations:

- 98,22: I have translated Vitelli's text with the second *esti* deleted. The MS K reading, *esti de kai hōs megethos*, is arguably preferable, but the sense is not at issue.
- 98,28: I have followed Vitelli in deleting *legō hē tomē* in this sentence.
- 113,13: I retain the MS *ei* ('if'), which Vitelli brackets.
- 117,1: I translate Vitelli's text, reading *enantiōn* with the MSS. There is a variant *enantia* in one MS. The sense is not good and I suspect that the correct reading might have been *atomōn* (i.e. composed of angled atoms).
- 117,8: I have closed the parenthesis before 'but in another thing', whereas Vitelli closes it at the end of the sentence.
- 125,7: *pantēs* appears to be a misprint for *pantes*.
- 125,18: 288b28 is a misprint for 188b28.
- 134,21: Vitelli enters asterisks after *metabolēs* to indicate that he suspects a lacuna. I have attempted a translation on the assumption that there is in fact nothing missing.
- 135,9: Vitelli indicates a lacuna but I have translated on the assumption that the text is complete as it stands.
- 135,23: Vitelli's text is possible and I have translated it, taking *kai hen to hupokeimenon* as parenthetical. Alternatively read *kai en tōi hupokeimenōi* (which might lie behind the reading noted for K at this point).
- 141,21: I have retained *ouk*, which Vitelli has in square brackets.
- 142,6: I have retained *ta hetera moria* which Vitelli has in square brackets.
- 171,27: I translate Vitelli's text without his square brackets (which are designed to excise the expression *toutestin hē hulē*). The same sense is obtained by reading (with t) *all' hēi sumbebēke tōi ex hou kath' hautō ginetai, toutesti tēi hulēi, on einai, toutestin eidopepoiēthai*.
- 172,8: I have translated the MS reading as it is, without the word *ou* which is supplied by Vitelli.

- 176,2: Vitelli marks a lacuna at the end of the sentence, but I have supposed that Philoponus wrote an ungrammatical sentence.
- 177,8-9,18-19: I follow Vitelli in retaining the words at lines 8-9 (following MS K) and removing them from lines 18 to 19 where they seem not to belong. I have not translated the words in square brackets at 18-19.
- 182,5: There is a misprint (eta for epsilon) in Vitelli's text.
- 182,17-18: I have re-punctuated the sentence, omitting the commas round the first *phêsi*, and changing the comma after the second *phêsi* to a full stop.

Philoponus  
*On Aristotle*  
*Physics 1.4-9*

Translation

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John Philoponus, Commentary on Aristotle's  
*Physics* Book 1, Chapters 4 to 9

<Section 1, Book 1 Chapter 4, 187a10-b7:  
How all being is one, for the natural philosophers >  
<1.1 Exposition and discussion, 187a10-b7>

**187a10** It is clear, then, that being cannot be one in this way. 86,19  
Turning to how the natural philosophers say, there are two 20  
ways.<sup>1</sup>

Having criticised the thought of the school of Parmenides and Melissus – the thought that says that being is one – Aristotle moves on to criticise the natural philosophers,<sup>2</sup> and he says: that whereas it has been shown that the way Parmenides and Melissus say that being is one is an impossible position, by contrast the way that the natural philosophers say that being is one <is possible>. But they say it not in virtue of all things being one, but in virtue of positing one principle of all things. They posit as sole principle: 25  
(a) Heraclitus, fire;<sup>3</sup> (b) Anaximenes, air; (c) Thales, water; (d) Anaximander, what is intermediate;<sup>4</sup> but their approaches are twofold. For one group of them produce the other things by condensation and rarefaction of their chosen element – e.g. Thales,<sup>5</sup> having posited air as the element, said that when it is thinned it makes fire; when lightly compressed it makes wind; further compressed it makes cloud, yet further water, and even more so all the earthy things. So this first group said that development occurs from the one; but Anaximander, having said that the element was 30  
the intermediate between fire and air or air and water, said that the rest separated off from this; for the contrarieties subsisted within this – which was infinite –, and then, separating out from it, made the rest. So the group who say it is by condensation and rarefaction produce the rest by alteration of their element, so that the result is that they call development ‘alteration’ (hence they say 5  
also that ‘he made becoming-such-and-such <a case of> alteration’<sup>6</sup>), whereas Anaximander produces the other things not by alteration of the intermediate, but by extraction of things subsisting within it. Then, wanting further to clarify how Anaximander said the other things come to be by extraction from the one, he mentions the school of Anaxagoras and Empedocles. 10

## &lt;Anaxagoras&gt;

First, Anaxagoras' opinion is as follows: he proposed that, on the one hand, the material principles of things were the uniform parts<sup>7</sup> (and that these were infinite in number) and contrariety, and that before the universe came into existence all of them were mixed together. Intellect (*nous*), which he posits as efficient cause, starting at some time, 15  
willed to separate everything from each other but could not in fact bring about the complete separation. While it did separate off the non-uniform things, which were themselves made up of uniform parts, it did not have the power to separate out the uniform parts pure; but having thence given a start to the process of extraction it goes on doing this for ever. Thus, then, everything comes to be from 20  
everything in virtue of everything being in everything: in wood there is also flesh and bone and gold and absolutely everything, but each thing is called after what predominates in it. As in the case of a heap of universal seed, if corn is included in a greater quantity than the other kinds of seed, that heap is called corn after what predominates, so where there is more flesh than other things, that is called flesh, and where there is more bone, similarly, it is called bone. And in the 25  
same way for wood and gold and the rest. Hence just as if someone were to extract little by little from the universal seed some hidden barley-grains and make an accumulation of barley, the person has not made a creation of barley, but only a manifestation and extraction, so the same goes for natural things too. For whenever bone or something else develops from flesh this is not properly speaking creation but only manifestation and extraction of what was previously concealed. Except that, in the case of the heap of universal 30  
seed, it is possible to extract one kind pure, e.g. barley, but in the case of the uniform parts this is impossible. For it is never possible for pure flesh or stone or gold or any other thing to be extracted, but 88,1  
invariably there is everything contained in every extracted thing no matter what size it is; but it is called after what predominates. Hence these small fleshlets or stonelets collected together make flesh or stone, or something like that, while the combination of the uniform parts makes the non-uniform things.<sup>8</sup>

## &lt;Empedocles&gt;

That was Anaxagoras' way. Empedocles, on the other hand, suggested that the material causes were four. These are the frequently 5  
mentioned elements (for which reason he also called them the 'roots' of all things, saying 'four are the roots of all things'),<sup>9</sup> and that the efficient causes were strife and love – but not both at once, but in turns. For when Love rules, the elements gather and combine and form the intelligible world, which he called '*sphairos*',<sup>10</sup> but when,

after a period of time, Strife comes to rule again, that *sphairos* 10  
disintegrates again and forms the four elements and this world.<sup>11</sup>

Since he found both that all the other things also come into being  
from the four elements and also that the elements come from each  
other, Empedocles said that composite bodies come into being from  
combination of the elements alone (for he supposed that they were  
unchangeable), whereas when air comes from water or fire from air, 15  
or again the reverse, it is not by changing of the water or air that the  
rest come to be, but that the elements are actually present in each  
other. Hence when air is rarefied the fire that is present in it and  
enclosed by it, finding a space, separates out, but then again when  
the air is condensed the water droplets present and dispersed within  
it pop out as a result of being squeezed by the pressure of the  
condensing, a bit like the effect on pips when they are squeezed out 20  
between the fingers. For they are there inside, hidden by the fingers,  
but when the fingers are pressed together they pop out under the  
pressure – not coming into existence then but merely being expelled  
and manifesting themselves.

#### <Anaximander>

In the manner in which philosophers in the tradition of Anaxagoras  
and Empedocles say that becoming is due to extraction, says Aris- 25  
totle, so also Anaximander said that the other things come into being,  
or rather separate out, from his element (which is what is between  
fire and air or air and water), which is infinite<sup>12</sup> and contains every-  
thing within itself. For becoming is nothing but extraction and  
manifestation. And it is clear that in saying this Anaximander was  
undermining his own claims. For the common origin of all things, the 30  
intermediate, would no longer be one, if that thing itself does not in  
fact underlie the derivative things – unless someone were to say that  
all the things inside the house derive from one element, namely the  
house that contains them.<sup>13</sup> So in saying these things <Anaximan- 89,1  
der> rather tumbles into Anaxagoras' position.<sup>14</sup>

#### <The motivation for Anaxagoras' view>

After saying these things, Aristotle turns to criticism of Anaxagoras'  
view, but before embarking upon the criticism he describes whence 5  
and from what ideas Anaxagoras was motivated in coming to this  
view that everything is in everything and that nothing is purely what  
it is. Aristotle says that it derives from two reasons: (1) the belief in  
the truth of the view (common to all the natural philosophers) that  
nothing comes from absolute and utter non-being,<sup>15</sup> but that every-  
thing comes into being from some entity. Anaxagoras used an argu-  
ment of the following form: (i) all things that develop come into being



10 either (a) from things that are, or (b) from things that are not – and it is clear that the cause of his error lay in the classification, in omitting one limb of the classification: for every thing that develops will come either (a) from not-being simpliciter, or (b) from being simpliciter, or (c) from what in some way is and in some way is not; by omitting the third section, which is also the truth, Anaxagoras fell  
 15 into this error – hence if (i) things develop either from entities only or from non-entities, but (ii) not from non-entities because of the common axiom; hence (iii) from entities. But if (iii) from entities, either (iv) from things of the same form or (v) things of a different form; it cannot be (v) from things of a different form (for a human being begets a human being and a horse a horse, but a human being does not beget a horse), but if it is (iv) from things of the same form then there is every necessity that whenever we see bone develop from  
 20 flesh, the bone that developed from it was there in the flesh, since it is not possible for things of different form to produce each other. And so it goes for everything. Since therefore everything develops from everything, either at the initial development or in the course of several (for blood comes from bread, and flesh from blood, then frequently bone or something else from flesh; for water or fire or earth or maggot or whatever else develops from it when it is decayed) there is every  
 25 necessity to believe that everything is mixed in everything. Nor did he turn his attention to the common substrate, on account of which it happens that everything develops from everything.

This, then, was the first thing that persuaded Anaxagoras to put together this view; and the second (2) was seeing contraries developing from each other. For hot comes from cold, and dry from wet, white from black and so on. Since contraries could not ever become productive of the contraries (for the contrary is rather more destructive of the contrary, not productive of it at all) there is every necessity that hot bits must subsist within the cold body, and the development of  
 30 the hot occurs when they separate out. Hence the contrarities must be together in the same things. But each is named from the one that predominates; for what has more hot bodies in it is called hot, and similarly cold, white and so on.

Having said these things Aristotle embarks upon the criticisms.

### <1.2 Textual analysis and exegesis, 187a10-b7>

5 **187a12** Turning to how the natural philosophers say, there are two ways.

With ‘how the natural philosophers say’ we have to understand ‘that being is one’. For the words ‘being is one’ are taken in common <with both sentences>.<sup>16</sup> It is worth pointing out that Aristotle contrasts the school of Melissus and Parmenides with the natural philoso-

phers, evidently holding the view that the former are not discussing physical matters, but are either engaged in theology or discussing some other things.<sup>17</sup> The reason why Aristotle criticises their arguments is lest some should interpret their discussion as being concerned with physical things and then be swept into false opinions about things by reason of the authority of the characters. 10

**187a12** For some, having made being – the underlying body – one (either one of the three or something else [that is denser than fire but finer than air], produce the other things by density and rarity making them several ... ]

Some of the natural philosophers, Aristotle is saying, ‘having made being one’ – that is, ‘having made the principle of all things and the substrate one’ – and made it not something incorporeal but an actual body, and a body that is either one of the three elements – fire, air or water – or something else additional to these and in between these (such as Anaximander posited), produced the other bodies out of their preferred element condensed or rarefied. 15

Having said ‘For *some* of the natural philosophers, having made being one ... produce the other things by density and rarity’ Aristotle does not immediately add the alternative, but after a bit he then says ‘whereas others separate out from the one the contrarieties contained within it’.<sup>18</sup> ‘For some, having made being one’ does not seem to invite the alternative appropriately; for having said ‘For some, having made being one’, he says, as the alternative to this, ‘whereas others separate out from the one ... ’ and so on.<sup>19</sup> It would have been logical to say ‘whereas others, having made it several ... ’, as the alternative to ‘For some, having made being one’. We therefore have to remodel the text a little so that we can see the logical alternative. We need to transpose the text as follows: 20

‘Turning to how the natural philosophers say, there are two ways: for having made being – the underlying body – one ... ’ and so on ‘... they produce the other things, some by density and rarity, while others say that the contrarieties contained within it are separated out from the one.’ 30 91,1

The phrase ‘how the natural philosophers say’ is not universal for all the natural philosophers; for it is clear that it is ‘how the natural philosophers *who proposed that the underlying matter was one* ... ’. And to this he adds an alternative when he says ‘and on the other hand all those who <say there are> one and many ... ’.<sup>20</sup> 5

**187a16** and these are contraries ...

Having said that (a) they propose that matter is one, and the substrate, and (b) they produce the rest by density and rarity, Aristotle

appositely points out that 'these' (i.e. density and rarity) 'are contraries', since this is useful to him for his own theory; for he is himself  
 10 shortly going to posit contraries as principles along with matter. For this reason he points out that the natural philosophers who preceded him, albeit not precisely, nevertheless had an inkling of the real principles of things, namely the contraries. For if they say that the rest are produced from their substrate by density and rarity, and  
 15 density and rarity are contraries, then they supposed that development is from contraries.

**187a16** or generally excess and deficiency, just as Plato says the large and the small.

Since he has said that the natural philosophers take contraries to be the form-giving principles of matter, Aristotle kind of collects all the  
 20 contraries into one more general contrariety that encompasses all the contrarieties in itself, namely excess and deficiency. The reasoning as a whole is as follows: (1) Those who make the underlying body one produce the rest from it by density and rarity, and these are contraries; (2) hence the natural philosophers suggested that the form-giving principles of things were contraries. (3) And so that we may comprehend generally what sort of contrariety it is according to  
 25 which they all said that the development of things from their <chosen> material occurred, we shall say that it is excess and deficiency. For this contrast of contraries is a more general one that encompasses the others in itself. Plato's principles large and small are of this sort;<sup>21</sup> of the two, excess is the large and deficiency is the small,  
 30 although Plato and the others differed in their hypotheses concerning the one and the contraries, as Aristotle will go on to say. He says that the contraries are excess and deficiency either (a) with respect to the superiority and inferiority of the contraries – for he will go on to say in what follows that the inferior one of the contraries corresponds to privation and the superior to form; and here, therefore, the  
 92,1 inferior, e.g. black, would be deficiency, and the superior, e.g. white, would be excess – either thus, then, or (b) so that out of contraries that are equally balanced we should say that the one subsisting in the greater bulk is excess and the one in the smaller bulk is deficiency. For example if we take air and earth, such that the air is moving upwards to the same extent as the earth <is moving> down-  
 5 wards, and (in summary) in such a way that the things engaged in contrary motion are travelling at equal speeds, then on the one hand the air, being in the greater substrate, would be excess in respect of volume, whereas the earth would be deficiency, being in a lesser volume. <This is> because a heavy body changing to a light one also acquires a rarefied volume that is invariably larger, while a light <body> changing to heavy acquires a lesser <volume>.<sup>22</sup> If therefore

they are equally balanced regarding their respective weights, necessarily the light one will have a greater bulk.<sup>23</sup> Someone might say the same about white and black too, and the rest of the contraries. Perhaps what becomes white from black also becomes more spread out across its underlying substrate. Except that since white is reflective and black absorbent,<sup>24</sup> the white would be excess, as the explanation of this, and the black would be deficiency, as absorbent.<sup>25</sup> And similarly for the rest.

But perhaps we ought not to take the account on board straightforwardly for all contraries, but <just> in the case of those that are causes of development and decay.

**187a18** Except that he makes these things matter and the one the form, whereas they make the one the underlying matter, and the contraries *differentiae*.

It is in a similar manner that Plato, and those who propose that the element is one but make the other things from it by condensation and rarefaction, posit three principles: the contraries and the one (just as Aristotle himself also does, in what follows);<sup>26</sup> however Plato held the reverse of their opinion concerning the characters of the principles. For the others say that matter and the substrate are the one, while the contraries are forming-giving *differentiae* of the substrate (for the substrate is dominated sometimes by condensation and sometimes by rarefaction, and thus gives rise to the bodies) whereas Plato by contrast makes the contraries – by which I mean the large and the small – *matter*, and the one the *form* that supervenes on matter and makes the bodies.

But we know that Plato was a Pythagorean, and everything the Pythagoreans said was symbolic, given that they too call matter ‘the indefinite dyad’.<sup>27</sup> For since form is definitive and unifying, but matter is indefinite and the cause of dispersal for the forms – for <matter>, in taking on things that are naturally undispersed, disperses them; for in taking on the specification [*logos*] of human being which in itself is partless and undispersed, it disperses it, cutting it into diverse bits; indeed any part of the seed left behind begets the entire human being, precisely on account of the specifications of the animal being contained partlessly within the entire seed and within any portion of the seed – this explains why they were hinting at matter by means of the ‘dyad’; and further since matter is receptive of quantity first before the other qualities (for first it is quantified and becomes three dimensional) this is why Plato called the dyad ‘large and small’. Hence he called it a ‘dyad’ because of the indefinite aspect of matter and its having no definition of its own (for the dyad is first to have received its division from the monad), but ‘large and small’ because it is the primary recipient of quantity and because this is the

most proximate form of matter. For large and small are species of quantity.

**187a20** whereas others separate out from the one the contraries contained within it, as Anaximander says.

- 15 This is continuous with the material above.<sup>28</sup> 'For having made being – the underlying body – one, some produce the other things by density and rarity;' then this alternative: 'whereas others separate out from the one the contraries contained within it,'<sup>29</sup> one such being Anaximander. For he said the contraries subsisted within the intermediate, which was the element according to him.<sup>30</sup>

- 20 **187a21** And on the other hand all those who say there are one and many, like Empedocles and Anaxagoras; for they extract the other things from the mixture.

- Having said that Anaximander extracts the contraries from the one, to make it clearer for us how he meant the contraries were  
25 extracted from the one Aristotle mentions the view of Empedocles and Anaxagoras, and how they said that their elements were extracted from each other, as an illustration.

**187a23** for they extract the other things from the mixture.

- First, Anaxagoras says that the uniform parts<sup>31</sup> were formerly all mixed up together and Intellect extracts them from that mixture,  
94,1 whereas now they are always extracted from each other – for he says that each thing is a mixture of many uniform parts. Secondly Empedocles too extracts the elements from the *sphairos*<sup>32</sup> at the start, whereas now, he says, the four elements have been mixed with each other (though not all things as Anaxagoras said) and then emerge  
5 from each other by extraction, in the way we have described.<sup>33</sup>

**187a24** But they differ from each other,

- Anaxagoras and Empedocles – in that Anaxagoras says that Intellect once having started to discriminate from the first mixture goes on doing this for ever, and it is not possible for everything to become a single mixture again, whereas Empedocles does this many times; for at one time the elements are extracted from the *sphairos*, at another  
10 they are gathered back into the *sphairos*, and this recurs in accordance with a certain cycle *ad infinitum*.

This is the first difference between Empedocles and Anaxagoras; the second is that Anaxagoras said that his elements, i.e. the uniform parts, were infinite, while Empedocles had the following four ele-

ments: fire, air, water and earth. Aristotle says 'so-called' of these elements, because they are not properly elements (for they are not simple but composite). The elements proper are matter and form. 15

**187a26** But Anaxagoras seems to have thought they were infinite in this way ...

From this point Aristotle is trying to expound what kind of intuition Anaxagoras started out from in his hypothesis that the uniform parts were infinite and that all things were mixed in all. And he says that it was due to supposing that the opinion of the natural philosophers, that nothing comes from absolute and utter non-being, was true, so that what develops must have been there before. But if so, then development is extraction. Moreover, that is why he said that everything was mixed in everything, because he found that everything develops out of everything. And because he took development to be eternal and never-ending, he proposed that the uniform parts in each thing were infinite, so that development – that is to say, extraction – should not come to an end. 20 25

**187a29** That is why they speak like this: 'all things were together'; and why he made becoming-such-and-such <a case of> alteration. But others, collection and separation.

Because the natural philosophers supposed that nothing comes from absolute and utter non-being, they say, says Aristotle, that 'all things were together'. It is Anaxagoras who chiefly says 'all together',<sup>34</sup> and secondly also Anaximander: for he says everything exists in the intermediate, and that they develop out of it by extraction without the intermediate changing, but as a result of the other things being extracted from it. And Empedocles says that the elements, which he also calls 'principles'<sup>35</sup> and 'roots of all things',<sup>36</sup> subsist in each other, and whenever one of the other ones develops from water, the water does not change into it, but it subsists in and is extracted from it, and so on for the rest. And everything subsisted within the *sphairos*, he says, not just the elements which now subsist within each other, but also the forms of the compounds subsisted within the *sphairos*, but when Strife takes control the elements and the forms of compounds are extracted from the *sphairos*. Hence some also say that development is alteration, namely those who posit water or air and produce the rest by rarity and density, while others say it is collection and separation, namely Democritus and Empedocles and their lot:<sup>37</sup> by collection of elements (in the case of Empedocles) or of atoms (in the case of Democritus) they say that the other things develop, and by separation they are destroyed. And it is plain, on the other hand, that Anaxagoras, in saying that the uniform parts are extracted and that 30 95,1 5 10 15

this is what development is, also meant that several uniform parts collect for the development of the compound, and that they separate again from each other in destruction. But the term ‘alteration’ applies more generally to all of them; for things that are extracted or collected and separated undergo some alteration, in the one case of position, in the other of manifestation.

**187a31** And also from the fact that the contraries develop from one another,

– in that Anaxagoras thought that everything was in everything on the basis of this consideration as well, because nothing develops out of not-being, but they are seen to develop from the contraries, whereas the contrary is destructive rather than productive of contraries. Hence he concluded that all things are in each other, but are not apparent due to ‘smallness of the masses’. But each thing is named from what predominates, as with the universal seed; for this is called corn if the form of corn predominates. In the same way where flesh or water predominates, that is what it is called. The cause of his mistake was supposing that it is universally necessary that the things that develop come either from absolute and utter non-being or from being; for they come from not being, but not from not-being *tout court*, but from not being something – a charge which Aristotle will lay against him in what follows, and will also resolve.

## <Section 2, 187b7-188a18.

### Five arguments against Anaxagoras>

#### <2.1 Exposition and discussion, 187b7-188a18>

**187b7** If indeed the infinite *qua* infinite is unknowable.

Aristotle has now expounded Anaxagoras’ theory and said what intuition he reached the thesis from – that it was from thinking that nothing comes from not-being and from seeing contraries come from each other. Now he turns to criticism of his theory, and offers a number of objections that are destructive of Anaxagoras’ theory.<sup>38</sup>

The first<sup>39</sup> is a *reductio*, not based on the nature of the facts, but as an *ad hominem* argument against Anaxagoras and directly against the pretence of being an expert. For Aristotle shows that this thesis undermines all science. The objection goes like this: if the principles of objects are uniform parts, and the uniform parts are infinite, and the infinite is unknowable in its very nature, then the principles of things are unknowable. But things whose principles are unknowable are themselves also unknowable. Hence things are unknowable. So science is eliminated from things, if knowledge is; for science is a form of knowledge – knowledge has a broader extension



than science.<sup>40</sup> Science is inclined to offer definitions and encapsulate objects in a rational formula, but it is impossible to define the infinite in a rational formula, if it is indeed infinite – that of which it is always possible to find something further beyond the given quantity – for we immediately make it finite. We shall therefore undermine the most exact of all the sciences, geometry and astronomy. And evidently Anaxagoras is under the impression that he possesses science of things when he thus instructs us about them. So that if Anaxagoras is an expert, then the principles of things are not infinite; or if they are infinite, then he is not an expert. But if he is not an expert, we shall not believe his presentation concerning the things he does not know. This, then is the first objection, which is a *reductio*, as I said, not factual. 20 25

The second objection<sup>41</sup> is factual. Aristotle adopts an axiom of the following sort: all the forms naturally subsist in some finite quantity, and do not naturally grow to just any size, nor naturally shrink to just any smallness, but there is a limit both to the greater and to the smaller, beyond which the form cannot exist.<sup>42</sup> Let our first argument relate to the more perfect forms, for the reasoning is clearer in relation to these, as they are more distinct. The form of human being can, on the one hand, occupy a size of one cubit, while on the other hand it can also occupy four or five cubits; it cannot, however, increase indefinitely. For no human being would reach a hundred cubits, or a size equal to the world. It is not a notional human being that we are considering, but a real one. It is clear that this cannot grow to some huge size above everything, but that there is some finite size beyond which it cannot grow. Forms stretched over a huge base become attenuated. 30 35 40 45 50 55

So then, just as it is impossible for the forms to subsist in any size as regards increasing size, so it is likewise regarding reduction in size. A dwarf human being might occur, but not <a human being> one inch long or the size of a fig-pip. For the extremely small size cannot admit the form, just as, say, a carpenter will fashion the form of a ship in a piece of wood of one cubit, but no longer do so in one of one inch, and a potter would not fashion the form of an amphora in clay the size of a fig-pip. So then, just as for these things there needs to be some finite quantity as regards both largeness and smallness for the existence of the forms, so evidently also for the uniform parts. For the uniform parts are forms as well. Hence evidently the form of flesh and the form of bone and the form of water could not occupy just anything whatever, either as regards largeness (not, for example, something either equal to the universe or larger; for nothing like that could exist, but the argument is about real things), or as regards smallness; rather there is always some size, such that the form of flesh could not occupy something smaller. Hence there is a certain atomic and minimal flesh. And the same for every uniform part. 15 20 25 30 35 40 45 50 55



25 You might also discover that this is so from the following: all  
 composite bodies are formed not of matter mixed just anyhow, but  
 each form needs matter mixed just so, in order that the form should  
 supervene on the matter once the matter has thus become suitable  
 for receiving it. For if the elements were mixed just anyhow, the form  
 of flesh or of bone would not supervene on them, but the form of flesh  
 needs an underlying mixture of just this sort, whereas the form of  
 30 bone needs a different one, and another another. Hence if this is so,  
 and what underlies the forms of the composite bodies is not only a  
 quality – I mean this kind of mixture of the elements – but also a  
 98,1 quantity, it is plausible to suppose that in the same way that not just  
 any quality can underlie them, so also there is not just any quantity.  
 Why the lottery of taking, on the one hand, not just any quality but  
 something definite, but, on the other hand, any quantity whatever,  
 when quantity and quality are of equal status? So the quantity that  
 5 underlies the forms is defined too.

Hence there is a minimal flesh and a minimal water, such that  
 the forms of these could not occupy a smaller size. And this is to  
 be expected. For if what is going to become flesh is acted on by the  
 agent, it is plausible that, just as something that is being divided  
 could not be divided no matter what size it is, but escapes the one  
 10 dividing it by reason of its smallness, even if it is potentially  
 divisible, so also something that is to be affected as to quality is  
 not affected whatever its size, but escapes the effect by reason of  
 its smallness; but without being affected evidently it will not  
 receive the form of the agent.

In response to these points, the mathematically trained raise a  
 difficulty for us. If it is granted, say they, that the given straight line  
 is divided in two, since every magnitude is divisible *ad infinitum*,  
 15 evidently we might also divide the flesh, which you say is minimal,  
 into two. Well then, are the divided bits flesh or not? If they are of  
 flesh, then it is possible to get flesh smaller than the given bit of flesh,  
 and that was not the minimum. On the other hand if the divided bits  
 are not of flesh, how do they make flesh when they are put back  
 together again? And if flesh is uniform, evidently its parts would be  
 20 flesh. So it is possible to get a smaller piece than any flesh you have  
 got, since all flesh is also uniform.

In response to these points we say that it is possible to take flesh  
 either as a form or as a magnitude.<sup>43</sup> As a magnitude, flesh is divisible  
*ad infinitum* (so that it is not possible to get a minimal magnitude)  
 whereas as a form it is no longer possible to divide it *ad infinitum*,  
 25 but it will invariably stop at some minimal flesh; if we divide this,  
 immediately we destroy the form of flesh simultaneously with the  
 division. For just as it is possible to take the human being either as  
 human being or as magnitude, and as a magnitude it is divisible *ad*  
*infinitum* and always into homogeneous magnitudes,<sup>44</sup> nevertheless

if I divide it *qua* human into head and feet, immediately the form of human being is destroyed simultaneously with the division, and exists neither in the whole (for the whole does not exist either) nor in one of the parts (for human being is uncuttable) – so also I say that even if you were to divide the minimal flesh, you would immediately destroy the form with the cut; for the minimal flesh is uncuttable, and the pieces cut off are magnitudes but not flesh.<sup>45</sup> Even if you put the pieces of the human being together a thousand times, you still would not make a human being, because it requires not just assembling the parts, but also the presiding nature that imposes the forms. The same is true, I claim, for the uniform parts, that even if you put together the pieces of cut flesh a thousand times, you still will not make flesh, without the nature being indwelling. If all the timbers out of which a ship is built were heaped together no ship would emerge, and if all the timbers and stones from which the house is made <were heaped together> the house would not emerge without the craft presiding. In the same way, even if the portions of flesh were put together, no flesh would emerge without the nature presiding. But the minimal flesh is also uniform, but in a quantity that preserves the entirety. For then it also preserves the form of flesh. Then indeed the parts taken potentially are flesh,<sup>46</sup> since the whole is too, but once divided, they are no longer <flesh>.

Hence we have demonstrated throughout that there is a minimal flesh, and this follows logically from the procession of things. For there are some things that are the most general and universal, extending to all the things there are – e.g. being and the one, for there is nothing that does not participate in the one or in being – whereas the ones called individual forms are confined in their predications due to being most particular in terms of their forms, and they are neither predicated of more than one thing (human <is predicated> only of humans, horse only of horses) nor of those things of which they are predicated in any condition; for the human corpse is not a human being, nor is part of a human still a human. Flesh, on the other hand, and bone and the uniform parts occupy a middle position: they extend to fewer things than being and the one, but to more than the individual forms. For flesh and bone are predicated both of a horse and of the other animals, and of the parts of them; not however of a subdivision of the minimal flesh or bone when that is divided. For then flesh or bone would no longer be predicated of them, but the one and being would, none the less. For even if the parts of the minimal flesh are not themselves flesh, nevertheless they are entities; for they are magnitudes and bodies.

The second axiom adopted by Aristotle<sup>47</sup> is that every finite body is measured by a finite body, the greater by the lesser. For example a one hundred cubit body is measured by a ten cubit body ten times, and by a one cubit body one hundred times. Indeed it is also measured

by a one inch body, and to put it simply, the greater is measured by any smaller finite body.

By adopting these axioms he demonstrates that it is impossible for everything to be in everything and for extraction to go on indefinitely. His first factual objection, which is the second from the beginning,<sup>48</sup> is as follows: if from this uniform part of water is derived a uniform part of flesh, and from that another again and then another again and another, since the flesh in the water is limited in quantity (given that that uniform part of water is itself limited in quantity), and every finite quantity is exhausted when finite quantities are continuously taken from it,<sup>49</sup> there is every necessity that when some flesh portions have been continuously taken from the flesh that is in the water, that flesh will be exhausted. For it is not the case that due to the magnitudes being infinitely divisible, the flesh in the water will be continuously divided into smaller portions and will never run out, by being halved for instance; for even if it were always halved, it will invariably get to the minimum quantity of flesh (for it has <already> been demonstrated that there is a minimum flesh). But if by being divided the flesh in the water will <ultimately> get to the minimum quantity for flesh, it is clear that when that has been removed flesh will no longer be extracted from that water. But if this is so, it will no longer be the case that everything is in everything, nor will the extraction go on indefinitely.<sup>50</sup>

Even if the extracted flesh portions are not pure, but mixed with other uniform parts, that too will not make any difference to me. For even if they do not come out pure, since the hypothesis has it that the extraction goes on indefinitely, it is necessary that all of the entire flesh that is in the water must be exhausted – even if the continuously extracted flesh-bits are minimal – by reason of the second axiom, which says that finite is measured by finite. If this is so, the extraction does not go on indefinitely.

Thus one of two things must be true: either the extraction of the flesh gives out, as the argument has shown, or if flesh-bits were extracted indefinitely from the water, then, since the minimum quantity of flesh is fixed, infinite numbers of things of equal size must exist in a finite magnitude; which is impossible. For that is the same as saying that the infinite is in the finite; for what is composed out of infinite things is infinite.

The third objection:<sup>51</sup> Aristotle gives another of the same sort.<sup>52</sup> If the quantity of flesh is determinate in the direction of both increased or decreased <size>, it is impossible for something else to be extracted from the minimum flesh. For every finite body becomes less when something is taken from it, since everything finite is measured out by every lesser finite thing. So that if something is to be extracted from the minimal flesh, it will [then] be less than the minimal flesh, which is impossible. So it is not the case that everything is in everything.

The fourth objection.<sup>53</sup> If everything is in everything, Aristotle says, and extraction goes on indefinitely, there will be infinitely many portions of flesh in each uniform part, and infinitely many <portions of> bone, and just infinitely many things without qualification. And again in each portion of flesh in the uniform part, or <each> portion of blood or of anything else, again all things will be infinitely many, and in each of those, infinitely many again. Hence in each uniform part there will be infinitely many times infinity. What could be more ridiculous than for there to be, in the least part of flesh, an infinity times infinity of bodies both in number and in magnitude? In number because things that merely touch each other are distinct from one another; in magnitude in that what is composed out of infinite things is infinite.<sup>54</sup>

Not only will every uniform part encompass infinity times infinity, but also the places will be infinity times infinite; for the stuffs that are not incorporated but have already been extracted are divided from each other, and these are infinite. So that the places encompassing them are also infinite, and also the places between, by which they are kept apart. So we shall reintroduce the infinity times infinity, infinity times, which is ridiculous.

Fifth.<sup>55</sup> that Anaxagoras' 'Intellect' is unintelligent,<sup>56</sup> Aristotle says. For if he wants to pick apart everything both according to quantity and according to quality, in such a way that neither will the different uniform parts be in each other (for instance the uniform parts of flesh and bone and the rest), nor will those which are identical in form but numerically distinct (for instance the uniform parts of flesh) – yet this is impossible because of magnitude being infinitely divisible and because the different uniform parts can never be pure – then his intellect would be unintelligent in attempting the impossible.<sup>57</sup>

That the things are never to be picked apart is said by Anaxagoras correctly but without understanding, according to Aristotle. For both attributes<sup>58</sup> and states<sup>59</sup> are there in the entities, and these can never be isolated from their substrates. So if Intellect wishes to isolate everything, obviously <it wishes to isolate> the attributes and states as well. But these are impossible to isolate. So the Intellect is unintelligent in seeking unintelligible things.<sup>60</sup>

However, Aristotle says, Anaxagoras takes the idea of things developing from things of the same form in the wrong way; for (Aristotle says) there is a sense in which things develop from things of the same form – clay forms from clays of the same form, a greater quantity out of smaller ones; but it also develops from things other in form, from water and earth, and a house comes from bricks and timbers, which are other in form. So he was wrong to take it that things invariably come from things of the same form. And we see this not just for artifacts, but natural things too: fire from logs, air from

25 water, and various creatures emerge from decomposing bodies – not just from animate ones but from inanimate ones as well.<sup>61</sup> With these comments, Aristotle claims that if it is possible to give rise to the same things out of infinite things and out of finite things, generating them out of finite things is more elegant than generating them out of infinite things; for the infinite is unknowable. Hence Empedocles is better than Anaxagoras, to this extent, given his finite principles hypothesis.

## <2.2 Textual analysis and exegesis, 187b7-188a18>

187b7 If indeed the infinite *qua* infinite is unknowable ...

30 The first objection, the *reductio*. What is unlimited is unlimited either in number or in kind. And what is unlimited in kind is invariably unlimited in number as well. For if there were unlimited forms, the substrates for those forms must be unlimited as well. But 102,1 if the infinity were numerical, it no longer follows that it must be unlimited in form as well. For it is possible to suppose that the substrates are infinite in number, but all are of the same form.

5 So, whatever form the infinity takes, that is also the respect in which it is unknowable. Hence if he supposed that things were infinite in number but limited in their forms, it would be possible to comprehend what sort of principles things come from, but not how many. But since Anaxagoras posited that the principles were infinite both in number and in kind, evidently the principles must be unknowable in every respect. But with the principles being unknowable, the things derived from them are also unknowable. For the point at which there is knowledge of composites is when we 10 comprehend how many and what sort of principles they are put together from.

187b13 And furthermore it is necessary that that of which a part can be of any size whatever, in respect of largeness and smallness, can also be so itself.

The first of the premises, to the effect that the size of the flesh and the other forms is determinate in the direction of both increased and 15 decreased <size>, and it neither grows *ad infinitum*, nor shrinks *ad infinitum*. Aristotle establishes this from the wholes – I mean the composites – of which the uniform parts are parts, and he establishes it *via* the second of the assumptions. This is the argument: if the parts can grow or shrink *ad infinitum*, then the whole would be able to grow or shrink *ad infinitum* – for the whole is composed out of the 20 parts; nor can the whole grow or shrink without the parts growing or shrinking – but in fact the whole is unable to grow and shrink *ad*

*infinitum*, so likewise the parts. Hence the quantity of the parts will come to a halt with respect both to greater and to smaller <size>. So there is a minimum flesh and bone, just as there is also a maximum one.

But perhaps someone may object to the reasoning by offering this argument on behalf of Anaxagoras: that just because the shrinkage of the uniform parts continues *ad infinitum*, it need not follow thereby that animals and plants also shrink *ad infinitum*. For if in each creature there were one uniform part of flesh or bone or blood it would be plausible that the whole would grow or shrink in just the way that the part grew or shrank; but, as it is, that is not how things are, but instead several uniform parts of flesh or bone or the rest come together and thus make up the flesh and the bone of the creature. So it is not necessary that the creature shrinks along with the uniform parts. For even if they are tiny, it is possible for a number of uniform parts to compose the body of the creature just as, say, the stones, from which the house is made, could shrink *ad infinitum*, without the house doing so too because it is made of lots of stones, not just one. So the same <house> could at one time be made out of fewer, if they were relatively large, and at another time out of a greater number, if they were relatively small.<sup>62</sup>

However, even if this is so, the quantity of uniform parts out of which a human being's flesh is made is invariably determinate. So let there be some five uniform parts of flesh. Do these shrink *ad infinitum* or not? On the one hand, if they shrink *ad infinitum*, they will invariably reach some size in which it is impossible for the flesh of a human being to be, for instance finger-high or in the size of a millet seed. So if it is impossible for the human being to be reduced to this size, it is clear that it is impossible for the uniform parts of the flesh too, so that the argument is returned to the same point.

But suppose someone were to say: 'But the nature of the uniform parts is such as to shrink indefinitely, but the composite item, such as the human being, is not such as to be preserved when the uniform parts are excessively reduced in size. Since according to your position as well, given that flesh can evidently exist in a much reduced size, supposing that the flesh of a human being is of the same sort as the flesh of children and of embryos, still in the adult creature it does not get much reduced before the creature is destroyed. So in the same way although the uniform parts are divided *ad infinitum*, yet the whole creature is not such as to endure in the uniform part no matter what condition it is in.'

But this argument belongs to people who no longer retain the Anaxagorean theses. Anaxagoras said that the composite item and the whole is nothing different from the concurrence of the uniform parts. For us, who hold that forms supervene from outside onto this composition and mixture of elements, the forms being something

other than the substrates, this follows logically – for it is not in the nature of the form to supervene no matter what condition the uniform parts are in. But for Anaxagoras – who says that nothing else supervenes from outside besides the uniform parts, but that the uniform parts are universally among the simples (for even the very colours of the various veins and membranes of the eye,<sup>63</sup> say, and all the qualities in the compound, exist among the simples) – for him the logical outcome is for the whole invariably to shrink along with the shrinkage of the parts. For why should it not be that just as more or larger uniform parts of an eye come together and form the large eye, so also the small one? So the reasoning would necessarily be correct, as far as Anaxagoras' theses are concerned.<sup>64</sup>

But what does it really mean to say that the flesh of a human being is composed of many fleshlets? Why is each of these many fleshlets not composed out of many, if the division of the uniform parts is *ad infinitum*? So that either there will quite generally be no one uniform part, or the flesh of the human being too will be one. But that also will turn out to be ridiculous: the flesh of the elephant being composed of fewer fleshlets, while that of the gnat is composed of more. For it will no longer make any difference to speak of more or fewer when the size of the principles is indeterminate both as to greater and as to lesser size.<sup>65</sup>

**187b15** I mean one of the sort of parts into which, being within, the whole is divided.

It is possible to take the phrase 'being within'<sup>66</sup> two ways: either (a) with respect to the part or (b) with respect to the whole. (a) With respect to the part as follows: Aristotle says, 'I mean these parts which have come to exist after being divided off from the whole and are not destroyed; for certain effluences always arise from the body. So the effluent bodies are capable of existing in themselves even after their division from the whole.' (b) If on the other hand we understand 'being within' with respect to the whole, Aristotle says: 'the parts of this thing, by which I mean those such that even when they are divided off from the whole, nevertheless the whole still remains. Such are the bodies that are always effluent from us, as I said.' This is the sense then, but Aristotle added this so that no one should take him to mean by 'parts of the whole' the matter and the form, since he said 'of which a part can be of any size whatever'.<sup>67</sup> For this reason Aristotle says 'I mean parts such that they subsist in themselves even after division from the whole, or which by being divided do not destroy the whole,' neither of which applies to the form and the matter; for when the matter and the form are separated neither is the whole still preserved nor are they capable of subsisting in themselves. Nor are these parts of the composite but elements, so that one



would not speak of them being 'divided' from it; for 'dividing' is the term used for parts, but 'analysis'<sup>68</sup> for elements.

25

**187b18** But flesh [and bone] and things of that sort are the parts of an animal, and fruits <are parts> of plants.

Just as an animal is not uniform in its parts,<sup>69</sup> nor likewise are plants. For the parts of a plant are trunk, bark, branch, leaves, fruits, pith and anything of that sort that is different in form but in each case uniform as to its own parts.

**187b22** Further if all these kinds of thing exist in each other, [and they do not come into being but being already inside are merely extracted, and are referred to from what predominates, but anything comes from anything (e.g. water is extracted from flesh and flesh from water), but every finite body is exhausted by a finite body, it is plain that it is not possible for each to exist in each].

30

Aristotle wishes to set out the first of the objections, and accordingly having first stated Anaxagoras' thesis, and before he draws the conclusion, he sets down the second axiom, since he derives the first objection from both. 'But every finite body is exhausted by a finite body', he says. The term 'exhausted' is used in place of 'measured completely'; for what is measured, having equal quantities subtracted from it continually by the measure, runs short and is totally used up.

105,1

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**187b29** And even if the extracted [flesh] were always less, nevertheless it will not surpass a certain magnitude in smallness.

Lest anyone should say that it is not necessary that the flesh in the water will give out when fleshlets are continually subtracted – <because> although if equal quantities were always subtracted in fact it must give out due to the finite being measured by the finite, yet in this case the subtractions are diminishing all the time, so that it is not necessary for it to give out because a continuum is infinitely divisible – for this reason, then, Aristotle says that even if lesser quantities were always subtracted, nevertheless it is universally true that the bits extracted would not exceed a certain magnitude in terms of smallness. Since, therefore, the quantity of flesh is determinate, clearly the bits extracted will not diminish beyond the minimal flesh, but the division will stop at the minimal flesh. So there is every necessity that with such things (that is, the minimal fleshlets) being constantly extracted the whole will be used up completely, since the

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finite is exhausted by the finite, or if not, then an infinite number of equal finite things will be contained in what is finite, which is impossible. So the phrase 'it will not surpass a certain magnitude in smallness' is used in place of 'the extracted quantity cannot come out less than absolutely any size, even if less is constantly extracted; for there is a certain size, that of the minimal flesh, than which less is impossible to extract.'

**187b35** And in addition to these things, if every body must become less when something is subtracted ...

A further objection, the third from the beginning, to the effect that if the quantity of flesh is determinate, it is impossible to extract something from the minimal flesh. For if something were extracted from it, it would become less than the minimal flesh, which is impossible, and this is because 'every body becomes less when something is subtracted from it', and this is because everything finite is completely measured by everything finite.

**188a2** Further there would already be infinite flesh existing within the infinite bodies ...

Fourth, this: that it will turn out, given that there are infinite entities in each uniform part, and then again existing in each of the infinite entities infinite others, and so on *ad infinitum*, that the infinite is multiplied infinitely many times.

**188a3** Isolated from each other admittedly, but none the less real, and each one infinite.

Aristotle uses 'isolated' to stand for 'actual and distinguished by their places', <i.e.> not in the way that we say that all things exist potentially in the matter (for it was not in that way that Anaxagoras meant that all things exist in each other – in the way that matter is said to be all things in potentiality), but in the way in which, in the universal seed, all the varieties exist: barley and corn and the rest of the seeds existing in actuality. And infinite bodies exist in each uniform part, he <sc. Aristotle> says, and none the less each of those existing within is itself also infinite. For in that too there are infinitely many <bodies>.

**188a5** But 'never to be picked apart' [is said not knowingly but it is said correctly].

That the Intellect according to Anaxagoras is unintelligent in attempting impossible things, if it wishes to pick everything apart but

it is impossible for this to happen. But that everything is 'never to be picked apart', even if Anaxagoras said it unwittingly, nevertheless he said correctly. For <Anaxagoras> said that the bodies (or, alternatively, both affections and states) are never to be picked apart from each other, not because they lack the nature to subsist in themselves, but due to the fact that the mixture cannot have its ingredients thoroughly isolated, as for instance if one were to say that it is also impossible for the wine and the honey to be isolated from the mead. So if, amongst the 'all things' both affections and states are included, which are not such as to subsist in themselves, but the Intellect seeks to isolate these too when it wants to pick everything apart, it would be unintelligent in attempting impossible things.

**188a7** If they are to be picked apart, there will be a white and healthy that is not something else, nor belonging to a substrate.

For there is no white itself in itself, but there needs first to be something else, and then for it to be white or black or some such. For the white is either a human being or horse or lead paint or something else. So if the affections are to be isolated, there will be a white that is neither a human being nor something else, nor having its being in any substrate at all, which is impossible. Aristotle says 'belonging to a substrate'<sup>70</sup> in place of 'in a substrate'; but he uses this phrase in many senses.<sup>71</sup>

**188a13** But he also takes the development of things of the same form in a way that is not correct.

That Anaxagoras wrongly takes it that the things that develop come from similar things.<sup>72</sup> For a human being develops from human beings and a horse from horses, but things also develop from things dissimilar in form: wasps from rotting horses, bees from bulls, air from water, and fire from air.<sup>73</sup> So he was wrong to take it that development is invariably from things of the same form; but he adopted this due to thinking that nothing develops from not-being, but that things develop from something, and do so not without the contrary. And indeed he took the idea that nothing develops from not-being in an unsatisfactory way too; for something would not develop out of absolute and utter non-being, as its matter, but development must always be from what is-not-*something*. For both as regards the material cause, development is from what is-not-something – for the seed is not something, i.e. not a human being – and also as regards the efficient cause – for the cause must of necessity differ from what is caused, if in no other respect than at least invariably in the very fact of one being the cause and the other what is caused. So that the cause is in fact what is-not-*something*, for it is not what the caused is.

- 25      **188a15** And not the same way as bricks from a house and a house from bricks.

108,1 Not in the way that a house comes from bricks – not in that way does clay come from the clays, Aristotle says.<sup>74</sup> For the house develops from things dissimilar in form, the bricks, whereas the clay develops from things that are similar in form, the clays. But I have remarked that the clay is said to ‘develop’ from clays in a less than strict usage of language;<sup>75</sup> for this is not development but appendage, unless one were to say that such and such a *quantity* of clay simply comes into being.

- 5      **188a16** But this is how water and air both exist and come into being *from each other*.<sup>76</sup>

That is, from things that are *dissimilar* in form, like the house out of bricks.

**188a17** And it is better to take fewer and finite ones, as Empedocles does.

- 10 For if it is possible to generate the same things from the finite ones as from the infinite ones, the generation from finite ones is more elegant. For infinite ones are unknowable. Hence Empedocles would better conform to this in virtue of proposing that the principles are finite.

**<Section 3, Book 1 Chapter 5, 188a19-b26:  
on the idea that principles are contraries>  
<3.1 Exposition and discussion 188a19-b26>**

**188a19** But all make the contraries principles.

- 15 Having spoken against Parmenides’ and Melissus’ view at the start, and having shown that it is impossible for being to be one (for it could neither be a principle nor derivative from the principle),<sup>77</sup> Aristotle went on to the views of the natural philosophers, and said that some suggested that the principle was one and some several, some that they were infinite and others finite,<sup>78</sup> and then he refuted Anaxagoras’ view which suggested that the principles were infinite.<sup>79</sup> The logical next step was to show that there cannot be several and finite ones either. For once that has been shown, the truth is left, that
- 20 the material element is one. For that was his project, to give a demonstration about that. For indeed when he did the classification of the principles – that they must be either one or several – he was speaking of the material principles.<sup>80</sup> At the beginning he showed

that there is a principle of natural things, or rather he took it for granted that there are principles and causes and elements of natural things;<sup>81</sup> but we supplied Theophrastus' argument, whereby he demonstrated that there were principles of natural things.<sup>82</sup> But Aristotle demonstrated this very thing in his arguments in response to Parmenides and Melissus too,<sup>83</sup> first by confuting the hypothesis that most seriously rules out there being principles of natural things (this is the one that says that being is one; for if it is one, as I have already said,<sup>84</sup> both the principle and the things derivative from the principle are eliminated), and then if the realities are several, he adds at once that they are from some origin.<sup>85</sup> For since there is some kinship and difference among the several things, and this neither came upon them spontaneously nor from one upon the rest (for that would be the principle), it remains for the kinship to have come from something else more original in form. So it is clear that there is a principle of natural things; but this must be either one or several; and if several then either finitely many or infinitely many.

Aristotle showed, in his arguments against Anaxagoras,<sup>86</sup> that the principles cannot be infinitely many; it was reasonable to refute that hypothesis first, because it is in greater conflict with the truth, by which I mean the truth to the effect that the material principle is one. If, therefore, the material principle is one and it cannot be several, all the more it cannot be infinitely many. So it was logical secondly to argue that it could not be several and finitely many either, so that in this way what was left remaining would be the truth that the material principle is one. But this he does not do, but transfers first to the formal principles, and then later returns to the missing bit and shows that the material principles cannot be several and finitely many either. For having shown that the formal principles must be contraries, so that by acting and being acted on by each other they may effect development and decay (because not just anything can act on just anything nor just anything be acted upon by just anything, but contrary by contrary) he raises a difficulty for the argument. And having shown that it cannot be only contraries that are principles (for they would not be able to act upon themselves and be acted upon, if they cannot even come together by themselves, but what acts and what is acted upon must come together in the same place), then, as required, he introduces the argument about the matter, to the effect that there must be some third principle underlying the contraries, which will bring about development and decay by being acted on by them in turn. Then taking this point he refutes the outstanding segment of the classification of the material principles, namely that they cannot be plural and finite. For if the one substrate underlying the contraries suffices for development of the entities, a second would be otiose.

So, these are the things we have laid out in the foregoing exposi-

tion: we said these things for the sake of the structure and continuity of the argument. But the immediate task before us is to show that the formal principles must be contraries. That they are contraries is confirmed both by the testimony of the ancients and by reasoning. For everyone supposed that the principles were contraries, Aristotle says, both those who said that the entities were one and those who said they were several. For despite the fact that, in *Towards Truth*, he said that being was one, even Parmenides posited the contraries hot and cold as principles in *Towards Opinion*.<sup>87</sup> And he calls the cold 'earth' and the hot 'fire'.<sup>88</sup> Hot and cold are contraries. And Empedocles, who said that the four elements were principles, called fire hot and the rest cold. And those who generate other things from their chosen element by rarefaction and condensation, e.g. Thales, posit contraries as their principles. For rarefaction and condensation are contraries. And Democritus, in positing atoms and the void, called the atoms 'full'. For he said the full and the empty were the principles of things, but the full and the empty are contraries (which he called being and not-being, and thing and nothing, thing being the full and nothing the empty). Both Democritus and Anaxagoras said that composition and decomposition (of atoms for the former, of the uniform parts for the latter) are responsible for development and decay. Plato too posited the large and the small as principles. But all these things are contraries.

But perhaps someone will say that not everyone posited their chosen contraries as formal principles. For Plato said that the large and the small were matter, and so did Empedocles for the four elements. Similarly Parmenides for fire and earth.<sup>89</sup> For it is surely not the case (as someone might imagine) that he meant that fire was efficient or formal and earth material; for if these are contraries it is impossible for one to stand to the other as underlying matter. For contraries are destructive of each other, but matter is preserving of the form. So in this way it would not be the case that one is matter and the other form; but nor is fire efficient: for he posited them as contraries but contraries are equipollent and one does not act on the other any more than the other on the one.

But even if some of these posited the contraries as matter, yet it is not our present task to show once and for all which of them took them as matter and which as form, but simply that, moved by the very nature of things, they posited contrariety among the principles. 'And this plausibly':<sup>90</sup> for the following three things have to apply to the very first principles, namely (a) 'not to be derivative from other things'<sup>91</sup> (for they would not be *first* principles); (b) 'not to be derivative from each other' (for they would not be first *principles*, strictly speaking; for in that way each would be both principle and not principle);<sup>92</sup> and (c) other things be derivative from them (for this is particularly characteristic of the principles). All these things apply

to the primary contraries. By 'primary contraries' I mean the more generic ones, to which all the others can be reduced. For they are not derivative from others, because they belong in a primary way to the matter; nor are they derivative from each other, because neither is productive of the other, but other things are derivative from them, because by weaving together of these into matter all the other things are brought into being, and because development is by change, and change is from contraries and to contraries, as will be shown. 111,1 5

In this way, Aristotle shows that contraries are principles, from the opinion of the ancients. But he also shows the same thing by reasoning as well. First he takes two axioms agreed on the basis of the common intuitions: one that not just anything is such as to be affected by just anything, nor does just anything act upon just anything. For a line would not act upon sweet, nor be acted upon by it, nor would iron do anything to adamant. Nor on the other hand does just anything give rise to just anything (and this would be the second of the axioms). For a case of sweet would not arise from musical nor musical from black, but white comes from black, hot from cold and bad from good – and vice versa. Similarly what decays does not decay into just anything: musical would not decay into black, nor black into sweet, but musical decays into unmusical, black into white and sweet into bitter. Hence contrary arises from contrary, and contrary decays into contrary. 10 15

One should not be surprised if a little while back we said that contraries were not derivative from each other and now we are saying (or rather have accepted on the basis of clear and distinct perception) that nothing comes from just anything nor decays into just anything, but rather comes from the contrary and decays into the contrary. For we said above that contraries did not arise from each other, neither as from the efficient cause nor as from the material cause. For cold is not productive and creative of the hot, nor the hot of the cold, nor quite generally the contrary of the contrary, but (on the contrary) contraries are actually destructive of each other. But nor do contraries arise from each other in the way that we say that the statue arises from the bronze; for the one <contrary> does not abide the other remaining one when it supervenes, in the way that the bronze abides the form of the statue, and quite generally the matter abides the form. For in that way both the contraries would be there at the same time. So contraries do not come from each other in that way. But again 'from each other' is used for being after each other, just as Plato more properly put it when he said these things were 'after each other' in the *Phaedo*, because black is such as to arise directly after white, and once the black perishes white again, and the same for all things.<sup>93</sup> In this way contraries are 'from each other' in that something would not become hot without formerly being cold, and what perishes as a hot thing invariably changes to cold. So development is invariably 20 25 30 112,1

from contrary to contrary, and decay likewise. But if this is so, the principles of all naturally developing things would be the contraries.

- 5 Such is quite evident in the case of the development and decay of attributes, but since we are seeking the principles in common for all things and for substances themselves, we need to show how the principles of substances too could be the contraries; for it has been shown that there is no contrary to substance.

- 10 On the one hand development by alteration is clearly from contraries and to contraries, and not just that but also the change of the simple bodies into each other. For even if substance is not contrary to substance, still the change of elements into each other occurs in respect of contrary qualities. For while fire is not opposed to water as substance to substance (for they have the substrate in common) yet they are contraries in respect of forms. For each of them is endued  
15 with characteristic form, the one with the hot and dry, the other with the wet and cold. And when substance to substance is said to be not opposed this does not apply universally to all substance, but only to the composite substance, while the simple forms are characterised by contrariety: that is, the dry and the wet and cold and hot. But among the composite ones nothing is once and for all opposed to another; for the substrate of all of them is one and the same.<sup>94</sup>

- 20 It is plain, on the one hand, that the simples develop out of contraries and decay into contraries, whether the change is substantial, as in the elements, or in their attributes; but in the case of the composite substances it is not so obvious that they have their origin from contraries and decay into contraries. This happens, Aristotle says, 'due to there being no name for the contrasting dispositions'<sup>95</sup>  
25 for the developments. In order to show that the developments of the composite substances are from contraries he finds a method that matches his ingenuity whereby he has shown that composite substances too invariably develop from contraries.

- He says that the substances that arise by composition of the simples evidently have some proportion and harmony of their composition, in accordance with which they have come into being (for it  
30 is just such a kind of composition and mixture of the simples that produces the composites), and in general complexes of things either have just an arrangement whereby they arise, or just a composition, or both: for instance a statue has just an arrangement, because each of its parts needs to have its proper location, but the heap of produce  
113,1 has just a composition (for there is no need for an arrangement of the grains, but only heaping up). But a house has both arrangement and composition. One can see that the same applies to natural things. There is just composition for those of uniform parts, such as stones or cases of flesh or blood and that sort of thing; but there is composition and arrangement in the case of animals with non-uniform parts  
5 and plants and such like; but one cannot find arrangement alone in



the case of natural things. But it is clear that the composition of natural things differs from that of artificial ones, because in the case of artificial ones there is mere heaping up and juxtaposition of the components, while in the natural cases a certain mutual interaction<sup>96</sup> also arises among the components, which we call mixture.

If therefore a stone, a stick, a horse and a human being arise in accordance with some composition and harmony, it is clear that they also arose out of disharmony and non-composition. Just as a house is a particular composition and structure, so it arises out of non-composition and lack of this particular shape. Similarly if it is a case of <musical> harmony,<sup>97</sup> such as the Lydian, Phrygian or Ionian mode, being a harmony between the highest and lowest note of the chord that has the proportion of say 3:2 or 4:3 or 2:1.<sup>98</sup> For it is clear that that it arises from what is not in the ratio 2:1 or not in the ratio 3:2 or not in the ratio 4:3, which is wrongly tuned<sup>99</sup> for the Lydian mode perchance, or for the Phrygian, or for the Ionian. And the harmony and composition passes away again into non-composition and disharmony.

So just as this applies to these examples, so also it applies to the development of substances. For since a human being is this particular composition and harmony of simples, on which the form naturally supervenes, it is clear that it develops out of non-composition and disharmony, and quite generally everything that comes into being develops out of what is not that sort of thing; not, however, out of just any 'not that sort of thing' but out of the contrary. But the states and forms are each called by their own name, whereas their contrasting dispositions do not have names of their own, but are called by the shared name of the privation. That is why these things do not seem to develop from contraries in the way that the hot and the cold or the wet and the dry do – these also being what the simple bodies change into each other from, so that it is clear for these things as well what is the contrariety by which they arise, whereas for the development of the composite substances, 'due to there being no name for the contrasting dispositions',<sup>100</sup> it seems unclear whether their development is from contraries rather than simply from the privation whatever it might be, as it also is for artificial objects. For a Lydian tuning arises out of Lydian wrong-tuning, but Lydian wrong-tuning can be Phrygian tuning or that of another mode, or it can also be the simple wrong-tuning of strings at just any old tension, and with the strings being tightened and loosened back and forth at random. And the composition of a house, when it arises out of non-composition, this will be an indeterminate non-composition from which it arises. For the house-builder can make the house by putting together the stones and harmonising them from a different disharmony and non-composition of stones at different times. So in the case of artificial objects the contrary is not determinate, because for the majority of the



artificial objects development is not from contraries either, but merely from the privations. This is because there is no contrary to structure and shape, except in the sense in which what is unstructured is opposed to what is structured, and the shapeless to what has been shaped. But this is privation and state, not contrariety. So any of the arts which merely apply structure or shape to their individual products do not make their individual products out of contraries either, since there is no contrary to shape and structure. They merely make them from the privation. But those that operate with reference to the other forms of quality in which there is contrariety, these arts invariably create from the contraries or invariably from the intermediate. For dyers make black from white or from intermediates, frozen from melted, hard from soft and vice versa; and so on in every case.

Thus the arts; but nature, given that it does not merely impose structure on things, but also the other substantial properties among which there is contrariety, of necessity the things that develop thereby develop from some contrarieties, even if these contrarieties are not named. For nature does not make a human being simply from the privation, i.e. from non-human, since both a horse and a stone are also non-human, and everything else that comes after. So why does not a human being develop immediately from stones or from a horse or from one of the other things aside from itself – as its material cause, I mean – so that any equine sperm and whatever is analogous in horses to the woman's menses could become the matter of a human being?<sup>101</sup> Similarly why should it not be that a stone or one of the rest of the animate and inanimate things might become proximately the matter of a human being? Since not even the things that develop from the privations rather than from the contrary – not even these simply come from just any privation. For water could be called 'non-house' and a horse could be called 'non-house', but still a house would not arise out of them, because 'privation' does not strictly apply to them but rather 'negation', while privation applies to those things to which the state (*hexis*) can also naturally occur.<sup>102</sup>

But in the case of those in which the development is only of structures and shapes, in these cases it is not possible to find contrariety in respect of the privation; but in the case of things to which affective qualities apply,<sup>103</sup> to these contrariety also applies inevitably. In the case of the proximate matter out of which the human being develops, by which I mean the semen and the menses, even if these are called 'not human' because they have the privation of human being in them, such that as soon as they discard that they take on the form, yet it is necessary that there also be some contrariety in these things relative to human being – by human being I mean the composite, meaning the tuned body, onto which the vital form is naturally fitted to supervene. For if it is acted upon in some way and changes substantially, but like does not change into like, nor simply into just

anything else, but into the contrary, then there is every necessity that there be some contrariety in the semen, in respect of which it is affected, and thereby makes the body drier, say, from having been wetter, solid from liquid, colder from hotter, and thus by being affected more or less in respect of the contrary qualities it perfects the various parts of the human being, bone, flesh, sinew and the rest. 10

What I said about this case, I affirm that this also applies to all animate and inanimate things, including minerals indeed. For there too the same analogy applies. So that if these things are so, it is clear that all development is from contraries and to contraries. And decay similarly. Hence it has been shown on the basis of reasoning too that the form-giving principles of things must be contraries. 15

Perhaps it is also possible to retain the same analogy for all artifacts too; for it is not the case that a chair would come from the same disharmony and non-composition as a blackboard.<sup>104</sup> At present our discussion is about the directly proximate matter, which is proximate for this particular thing alone: it is for this reason that we are saying that not everything comes from everything. If our discussion were about matter taken simply, it is clear that, in terms of that, everything does come from everything, once each thing is broken down into matter and in this way the matter underlying that thing is capable of underlying all the others, and either directly and immediately or *via* some intermediates (that is to say, primaries)<sup>105</sup> changes into one thing after another. For instance when the stone has disintegrated, the four elements that were underlying it change into crops, and then that into blood, and blood into semen, which is proximate matter of a human being. But also immediately as when wasps or maggots develop from a rotting horse.<sup>106</sup> 20 25 30

So since our discussion is not about the shared sort of matter, matter taken simply, but about the most proximate matter, I declare that, not just in the case of natural objects, but in artifacts as well, it is not the case that just any form comes from just any disharmony and non-composition. For the carpenter sets up the material for the blackboard in one way and the material for the chair or something else in another way. So when the material of both the blackboard and the chair has been prepared but the bits of wood have not yet been joined up, there is one disharmony and non-composition in the material for the blackboard and there is also one in the material for the chair, and neither could the blackboard arise from the disharmony and non-composition of the chair, nor the chair from that of the blackboard. So contrasted with each one is its own particular disharmony and non-composition, in which some contrariety in respect of precisely this disharmony and non-composition will perhaps be discerned. 5 10

And the same for the rest of the things. In the case of, say, the Lydian mode too, there is a certain tension for each of the strings, and when this is achieved, at once the form of the mode supervenes. So

that mode's *disharmony* applies to the immediately preceding disharmonious tension – or rather, the most proximate disharmony, contrasting with the Lydian mode and with no other, is if each of the strings had acquired the appropriate tension, but before the strings had been, as it were, *combined* and before the sound from them had been mingled together.

### <3.2 Textual analysis and exegesis: 188a19-b26>

**188a19** Both those who say that everything is one and immovable ...

For despite the fact that he said that everything was one, nevertheless Parmenides posits hot and cold as principles of the things that are, in *Towards Opinion*.<sup>107</sup>

**188a22** ... and those who say dense and rare ...

among whom is Thales; for having posited the air as matter, he forms the rest out of that, by rarity and density.<sup>108</sup>

**188a22** And Democritus full and empty ...

For he called the atoms 'full' and said that they were kept apart by empty. So all things are formed from the weaving together of the empty and the full. But since there is considerable variation among things that exist, he posited other contrarieties so as to deliver the rationales for the difference of things. As far as the full and the empty are concerned, since all things are <composed> of them they would not differ from each other at all, so for this reason he posited three other kinds of contraries, in respect of whose differences the outcomes would be different. For <his theory was that> the atoms were contrary to each other in shape in virtue of some being angular, others without angles: for what is angular is contrary to what is without angles. So the composites were to differ in respect of this contrariety, in that some are composed of angled contraries,<sup>109</sup> and some of angle-free ones, and also in respect of the order of the atoms. For instance in this particular thing the spherical atoms (perchance) might be first, and the pyramidal ones later on (for instance in the human being it might be that the spherical ones are at the top, whence the head is sphere-shaped, but the pyramidal ones are around the jaw) but in another thing the reverse. The first is contrary to what is later. They also differ again in the position of the atoms, for instance if the pyramidal atoms in this thing have their points downwards, and their bases at the top (for instance in the jaw the points down and the bases at the top) but in another thing the points

at the top and the bases at the bottom.<sup>110</sup> Contraries in respect of position are up to down, right to left, front to back. So that Democritus too posited contraries as the principles of things; but in his Abderite dialect he called the shape, the position and the order ‘*rhusmos*’, ‘*tropê*’, ‘*diathigê*’: *rhusmos* for the shape, *tropê* for the position, *diathigê* for the order.<sup>111</sup> 10

**188a26** So <it is clear> that all make the contraries principles in some way. 15

Aristotle added the phrase ‘in some way’ because the angular and the angle-free are not strictly contraries, nor the straight to the round, except perhaps as state (*hexis*) and privation: *hexis* the straight, privation the curved, because the straight is determinate, but the curved is indeterminate. Similarly the angle-free and the angular. The states and privations are things of that sort. So that either these are not antithetical to each other at all, but just different, or if someone wants to contrast them, there is no other way to do it than as state and privation. 20

**188a27** And this plausibly.<sup>112</sup>

‘Plausibly’, he says, they posited the contraries as principles; for the following three things apply to the first principles, according to common sense:<sup>113</sup> (a) not to be derivative from other things (for they would no longer be first principles); (b) not to be derivative from each other (for if one were derivative from the other, the one would be principle and the other not, and if both were derivative from each other, each of them would no more be the principle than not the principle). But that (c) other things must be derivative from them is obvious. So since these things have to apply to the primary contraries:<sup>114</sup> for because they are primary, they are not derivative from others, but because they are contrary, they cannot be derivative from each other – for contraries are neither productive of each other (on the contrary they are destructive of each other) nor can one underlie the other (for the first principle must be unchangeable; but, being unchangeable, if it were to underlie its contrary then contraries would be in the same place, which is impossible). But in what way are the others derivative from them? Because all development is by change, as will be shown, and all change is from contrary to contrary.<sup>115</sup> 25 118,1 5

**188a31** We first have to accept that out of all things [in no case does it happen that just anything can be affected by just anything, nor does any sort of thing come from any sort of thing ... ] 10

Having shown on the basis of the testimony of the ancients that contraries are the principles, Aristotle wants to show this on the basis of argument as well. But first he sets out features that apply according to common sense<sup>116</sup> to all things that develop and decay. That is, that not just anything comes from just anything, nor does it decay into just anything, but both development and decay are from contrary to contrary. And this is clear for all the development of attributes: hot comes from cold, and passes away again into cold, and what comes to be up changes from things that were down, and again what is down from the ones that were up. And the same for all things.

**188a34** Unless someone takes it *per accidens*.

It is impossible, says Aristotle, for development not to be from contrary to contrary, except something *per accidens*, for instance if something becomes white from black, but the black thing happened also to be hot, one might say that the white developed from hot, because the thing from which it developed, the black, happened to be hot. Similarly if the musical person were to get warm, the warm is said to develop from musical *per accidens*, because the cold thing out of which the warm one developed happened also to be musical.

Aristotle will give the impression of contradicting himself, given that he said above that contraries do not develop from each other, but here he says that the contrary does develop in no other way than from the contrary. We have given sufficient exposition on the sense in which he means there that they do not develop from each other, but here the phrase 'from each other' refers to 'after each other', as indeed Plato put it more correctly.<sup>117</sup> 'After each other' would be more correctly expressed than 'from each other', because it is entirely necessary that something black cannot develop otherwise than if there was white before, nor hot that was not formerly cold. And the same for the rest.

**188b1** Or from those in between.

For instance a white or black thing develops from a grey one, where the grey is between the white and the black. For even if something develops from what is between, it develops from it not *qua* in between, but in that it has a share of the contrary. For the black comes from the grey not in that the grey is a mixture of white and black, but in that it has a share of the white. So these too come from contraries.

**188b9** Since things that are not simple but complex follow the same rationale too.

It is not, as some have taken it, that the earlier things were said

about things that change in respect of their attributes, while these  
 relate to things that change in respect of substance, so that we should  
 interpret substance as being composite. For if he said that sub-  
 stance is composite because it is composed out of substrate and  
 form, as they say, then even the real qualities are not observed  
 without the substrate.<sup>118</sup> And besides, if it was about every sub-  
 stance that he said 'since things that are not simple but complex',  
 why does he say that 'the contrasting conditions' of substances, in  
 respect of which they change, 'lack names'?<sup>119</sup> For in the case of the  
 simples – actually, I mean the elements – the contrasting condi-  
 tions out of which they change are obvious: from hot to cold, and  
 from dry to wet, and back.

So what is my own view? That Aristotle first set out to talk about  
 change in all things, and he talked both about how the things that  
 change in respect of their attributes change and also how the simple  
 bodies change, namely that it is evidently from contraries. But given  
 that complex substances appear not to have their changes from  
 contraries, it is for this reason that he explores the argument in  
 relation to these too. So he is saying that in the case of composite  
 substances too, developments are invariably from contraries, but  
 because the contrasting conditions lack names, this is not so clear.  
 For in some cases their privations are commonly named, but in other  
 cases not even the privations have names but only the negations.<sup>120</sup>  
 For the composition and harmony of the substrates, out of which  
 developments occur, and again the disharmony and non-composition  
 of them – these we can identify by common terms, using these very  
 terms harmony and disharmony, composition and non-composition;  
 but the individual harmony of each thing, and its contrasting dishar-  
 mony – for these we have no further particular words by which to call  
 them. Thus while we give names to the substrates, and to the  
 antitheses of those, out of which they develop and into which they  
 decay, by contrast we cannot any longer name the antithesis of their  
 forms privatively. Instead we name it by negation, 'non-human' or  
 'non-horse', even though the forms are named by determinate names  
 like 'human' or 'horse'. And the same in the other cases. But even if  
 'non-human' were also applied to stone and horse and to all the things  
 that come after human,<sup>121</sup> it is still clear that a human being does not  
 come from just any 'non-human' (not from horse after all, or from  
 stone), but there is something definitely antithetical to human, out  
 of which or after which the human being develops. Because this lacks  
 a name of its own, it causes one to stray into supposing that perhaps  
 the development is not from the contrary. But what applies in the  
 case of human applies universally, and what applies to development  
 applies also to decay.

- 20 **188b15** But it makes no difference to say it with respect to harmony or order or composition.

Since he has explored the argument with respect to harmony, for this reason Aristotle says that it would be no different if the development were not in respect of harmony (as in the case of a lyre), but in respect of composition or order, as in the case of a military camp. For the composition of a house develops out of non-composition and the order of a military camp develops out of disorder, and similarly also what is shaped, like the statue, develops from the shapeless: and these are not just any disharmony, non-composition, disorder or shapelessness, but the ones that are proximately antithetical to each composition or harmony or to one of the others. For that of the ship or of the statue would be a non-composition as compared with the composition of the house; but it would not be possible for a house to develop from that. So there must necessarily be *some* determinate non-composition from which the house <emerges>, at least broadly, even if not relative to an individual. Except that not even here is it simply from any old privation, but there is some individuating privation or indeed a certain contrary, out of which it develops and into which it decays. And what I've said about this case applies to the rest too.

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121,1

- 5 **188b20** And each of these is in some cases an order and in others a composition.

The house is a composition, but the statue is more an order of the parts. Composition is more properly used rather for things of different sorts, like planks, and stones and bricks, out of which the house <is composed>. But rather the order applies to the house too, and the composition to the statue. For one thing is first in the house, for instance foundations, then second the walls, then the roof, and it cannot be otherwise. And in the case of the statue there is also not just order of the parts but also composition.

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- 188b23** And the in-between things come from the contraries: for instance colours from white and black.

For grey, yellow, red and all the colours besides white and black, which are derived from a mixture of black and white, are 'in-between'.<sup>122</sup> So that if something develops from the in-between things, again it develops from the contrary, for in as much as the in-between has a share of the contrary, so the developing things develop out of it. Hence if this is so, necessarily all development and decay is from contraries and to contraries, and if so, the contraries would be formative principles of reality. The phrase 'either from contraries or to contraries':<sup>123</sup> 'from contraries,' development; 'to contraries,' decay;

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but it is clear that the rest <of the sentence> also applies to both: for the ‘to contraries’ also applies to development, and the ‘from contraries’ applies to decay, but more strictly ‘from’ applies to development and ‘to’ applies to decay, as Aristotle himself indicates in the final words.<sup>124</sup>

**<Section 4, 188b26-89a10: the search for the most  
general principles>**

**<4.1 Exposition and discussion: 188b26-189a10>**

**188b26** Up to this point the majority of the others have been 25  
virtually going along with us.

Aristotle has shown, both from the testimony of the ancients and by argument, that the formal principles must be contraries, in that change is according to contraries for all changing things. Since he 122,1  
wants to adopt the most universal principles of things that change in any way whatever, but not all changing things change according to contraries<sup>125</sup> – for there is also change from vice to virtue, from ignorance to knowledge: these are not contraries, however. Virtue is not opposed to vice nor ignorance to knowledge, but they are privations and states (*hexeis*). For vices are indeterminate as also are 5  
privations, but contraries are determinate because they are also formalised, and ignorance is clearly just the privation of knowledge. Take not simply those who have distorted opinions, and who are then led to understanding – for it is by privation that these in particular are antithetical to those with understanding, assuming indeed that 10  
vice in general is a privation of virtue, but because of the indeterminacy of the privation the antithesis of vice *vis-à-vis* virtue is not uniquely designated: just as curviness, being a privation of straightness, is not contained within a defined limit, but is simply every discrepancy from straightness, so it is with the vices. Nevertheless if we take the person who does not yet have distorted intuitions, but is being guided towards understanding from childhood, it is quite plain 15  
that he is being led from the privation, *viz.* ignorance, to the form, understanding. For no distorted opinion pre-existed, but merely ignorance of the truth.<sup>126</sup>

Since therefore Aristotle wants to adopt the most universal principles of things that change in any way whatsoever, but, as I said, not all changing things change according to contraries, he wants to refer the contraries back to the most generic principles of all the things 20  
that are, namely form and privation, according to which not just natural entities change, but also those beyond nature,<sup>127</sup> and to show that these two principles are the explanation of all change, and effect the changes by their own presence and absence in turn. So he wants to refer the principles back to these as to the most generic things, but 25



prior to doing that he first raises objections to his predecessors' opinions about the principles, and informs us about what they have in common, and what that is different. So he tells us that all those who offered opinions about the principles of things, even if they seem not all to posit the same contrarieties among the principles but this one this and that one that, yet still they all said things that were in accord with one another, and while they seem to differ in some respect, in some respect they all have something in common. They differ from each other in that some choose more particular contraries, others more generic ones, and some <choose> ones that are more accessible to sensation than to reason, others the reverse. For some contraries are more accessible to sensation than to reason, others more to reason than to sensation, but in both groups some are more generic, others more particular. For instance hot and cold, wet and dry, rare and dense, are more accessible to sensation than to reason, while strife and love, odd and even, monad and dyad, are more accessible to reason than to sensation. In each case there is both the more generic and the more particular; for instance among the ones more accessible to sensation, white and black, say, is a particular one; above that, hot and cold; above that, rare and dense; above that, large and small; and above that, excess and deficiency.<sup>128</sup> Among the contrarieties accessible to reason on the other hand collection and separation can be placed at the bottom as more particular, then strife and love as more widely applicable than this, and above that the odd and the even, and above that the monad and dyad. So those who chose as their principles either the hot and the cold (as Parmenides)<sup>129</sup> or the rare and the dense (as Thales) or the big and the small (as Plato), these are choosing principles that are more accessible to sensation, but some choose more generic ones and others more particular ones. But those who choose strife and love (as Empedocles) or odd and even or unit and dyad (as the Pythagoreans), these have chosen principles that are more accessible to reason, and again, among these, Empedocles has chosen more particular principles, but the Pythagoreans have chosen more generic ones. In this way they chose divergent principles – divergent, I mean, both in respect of the subject (for hot and cold is distinct from rare and dense) and also in respect of the generic and particular – but they all chose the same principles in respect of the fact that all chose 'the items from the same table of correlates', he says – that is in accordance with the same analogy. In the same way that what is the same can be the same not just in substrate or in description, but also by analogy (for we say 'as this is hot, so this is cold': here the sameness, or alternatively similarity, is neither in substrate nor in description, for the definition of each is different, but analogical. For we say that as 2 is to 4, so 500 is to 1,000; here again the sameness is analogical), so in virtue of the fact that all chose contraries, and

contraries from the same table of correlates, in this respect they all said the same things.

good	bad
monad	dyad
odd	even
love	strife
excess	deficiency
large	small
separation	collection
hot	cold

124,5

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We have to be aware that the Pythagoreans reduced all entities and all contrarieties to two parallel columns, one of the good and the other of the bad. They apportioned every contrariety between these two columns. To the column of the good they assigned the better of the contraries, and the worse to the column of the bad – e.g. white and black, rational and irrational, cold and hot, strife and love: they said that white, rational, hot and love belong to the column of the good, and the contraries of these to the column of the bad. And of the contraries adopted among the principles of things by the earlier thinkers, the first halves are ranged under the column of the good and the other halves under that of the bad. For instance, among the contrarieties accessible to reason, monad, odd, and love are placed under the good column, and their contraries under the bad one. Again, of the contrarieties accessible to sensation, hot, division, and large are placed under excess and excess is placed under the column of the good, and their contraries under that of the bad.

124,1

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So everyone has adopted the things from the same table; for they have either hot and cold, or collection and separation, or strife and love; and as hot is to cold, so collection is to separation, large to small and strife to love; they are antithetical in the same way. And conversely, as large is to separation, and separation to hot, so also is small to collection and collection to cold. For large encompasses separation and separation encompasses hot, in the same way as small encompasses collection and collection encompasses cold. So it is in this way that they are said to choose the same things, in virtue of choosing from each column either things that are correspondingly more particular or things that are correspondingly more generic; for no one chose, say, large and collection, or separation and cold (for these are not at the same remove from the good and the bad, but one is at a further remove and the other at a less remove). Everyone, rather, chooses these things, namely the ones that are at the same remove from the good and the bad. So in virtue of all choosing their favoured contrariety from the same table, in this respect all say the

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same things;<sup>130</sup> but different in so far as some <choose> rather those accessible to reason, others those accessible to sensation, some the more generic and others the more particular. So since we are looking  
 10 for the principles that are common to all, it is plain that those who choose the most generic contrarieties are more on the right lines; so that if the ones who choose the more particular contrarieties were aware they would surely be ready to choose the more generic ones so as to extend their principles to more. For this reason, therefore, we must first find out which would be straightforwardly the most widely shared principles of all, and posit them.

#### <4.2 Textual analysis and exegesis, 188b26-189a10>

15 **188b26** Up to this point the majority of the others have been virtually going along with us.

To this point, Aristotle says, all have been brought into agreement, to the extent of positing contraries as ‘the things that they call the principles’ of things.

**188b28** Even if they posit them without explanation ...

20 It is not that they employed no reasoning in order to establish the principles that they posited, but that they employed nothing convincing in such a way as to be capable of persuasion. But even if they set down their personal views in a way that lacked charm,<sup>131</sup> nevertheless all in concert suggested that the principles were contraries. So the kinship goes ‘this far’, but the difference is that some chose more generic and inclusive ones, and others more particular ones, and some <chose> ones that are accessible more to sensation than to  
 25 reason, others <chose> ones accessible more to reason than to sensation.

**188b33** Some chose hot and cold ...

Parmenides, and of these he called the hot ‘fire’ and the cold ‘earth’.<sup>132</sup>

**188b33** and others wet and dry ...

Porphyry says that Xenophanes thought the dry and the wet, by which I mean earth and water, were principles, and he adds a quotation from Xenophanes that shows it:

30 Earth and water are all things that arise and develop.<sup>133</sup>

And Homer too seems to be of this opinion, where he says,

But may you all become water and earth.<sup>134</sup>

And indeed it is no surprise that he too claims that the principles are two, like Parmenides in *Towards Opinion* (despite saying, in *Towards Truth*, that there is one).<sup>135</sup> 126,1

**188b34** But others posited odd and even or strife and love as causes.

Strife and Love: Empedocles; odd and even: the Pythagoreans, i.e. monad and dyad. These people named things that are more accessible to reason than to sensation; for neither strife and love nor odd and even are accessible to sensation. 5

**188b37** ... different as indeed it seems to the majority ...

That is, it is obvious to everyone how they say different things, for hot and cold are different from strife and love, and the same for the rest. 10

**188b37** ... but the same *qua* analogue: for they draw them from the same table.

In order to explain how they choose them according to a single analogy Aristotle has added 'for they draw them from the same table', but we have to say in what way they draw them from the same table.

**189a2** For some of the contraries encompass and others are encompassed. 15

It is in these words that Aristotle indicates in what way they draw them from the same table. For since some of the contraries are more generic and others more particular, I would say that they draw their contrarieties from the same table because they choose correlated contraries that are to the same degree encompassing or encompassed. They do not choose, say, hot and black (for hot is encompassing while black is one of the things encompassed) but rather hot and cold which are both to the same extent encompassing. 20

**189a3** ... and worse and better ...

For those who choose the more all-encompassing contraries make a better choice, since one ought to choose the most widely shared principles that apply to all things, while those who choose the more

- 25 particular ones make a worse choice because they have chosen ones that apply to fewer things and not to most or all things.

127,1 **189a5** What is generic is accessible according to reason, while what is particular is accessible according to perception.

- Here Aristotle is not using ‘accessible’ in the same sense as above. There he was dividing the contraries into those accessible to reason and those accessible to perception, and within each of these categories he drew a distinction between the more generic and the more particular. There were more generic and more particular examples among those accessible according to perception and likewise among those accessible according to reason. So what he now says is not what he then said was accessible to perception or to reason – rather, within each sequence the more generic are more accessible to reason and the more particular are more accessible to perception. For even among the things that are accessible according to perception those that are more generic, for instance rarity and density, are more accessible to reason than hot and cold, and the latter are more accessible to perception than to reason. Similarly excess and deficiency are more accessible to reason than to perception, and more so than rarity and density. Similarly among those accessible according to reason, the more generic are more accessible to reason than the more particular, while the more particular are more accessible to perception than the more generic.

**<Section 5, Book 1 Chapter 6, 189a11-20: There can only be one primary and maximally general contrariety>**  
**<5.1 Exposition and discussion: 189a11-20>**

**189a11** The next thing would be to say whether they are two or three or more ...

- 20 Aristotle has already shown that one should choose contraries as the principles of natural things, but now the task is to show that the primary and most universal contrariety must of necessity be just one. So with the aim of showing that, he embarks again on the discussion of the principles and demonstrates that the principle cannot be one, nor infinitely many, but there must be more than one, and these must be finite in number. This dichotomy is not confined to formal principles alone nor to material ones alone, but applies to principles generally. Just as the material principle must be either one or several, and if several either finite or infinite, so likewise principles in general must necessarily fall under the same dichotomy. They must be either one or several, and either finite or infinite.
- 30 By excluding the extremes, Aristotle leaves us with what is in

between and is the truth. On the one hand there cannot be one principle, because it has been shown that contraries have to be principles, but a contrary is contrary to something (for nothing is contrary to itself). They fall into the class of relations. Hence it is impossible for the principle of natural things to be just one. 128,1

On the other hand the principles cannot be infinite in number, firstly because of the undermining of science, as mentioned above,<sup>136</sup> or rather the undermining even of simple knowledge of things, for there is no knowledge of infinites, but if the principles are not known, nor would the things that derive from them be known; hence those who suggest that the principles are infinite universally import ignorance of all things; and secondly it will follow (as Aristotle says in *De Generatione et Corruptione*) that infinity is thereby multiplied by two. For a contrariety comprises two contraries, so that if the contrarieties are infinite in number, there will be twice as many contraries. So there will be double infinity. 5 10

Thirdly, for each class there is one most generic contrariety, says Aristotle, and this is evident inductively: in surfaces the primary contrariety is in terms of broad and narrow, while rough and smooth, even though they belong principally to surfaces, nevertheless this is not *qua* continuous quantity, but in virtue of partaking of the category of posture, for the rough and the smooth belongs to it in virtue of a particular layout of the parts; whereas broad and narrow belong primarily to it as a surface – that is as one of the forms of magnitude. Similarly in the class of numbers, the primary contrariety is odd and even, in the class of colours black and white – for the rest fall under these two. So if substance, too, is one class whose principles we are seeking, it is entirely necessary that in this case too the primary contrariety is one. But there is in substance a most generic contrariety in respect of form and privation, under which all others are subsumed, and this antithesis is observed not just in substance that is subject to development and decay but also in the substance of the heavenly bodies and in the substance of what is beyond nature.<sup>137</sup> For the soul too, in changing from ignorance to knowledge, changes in respect of possession and privation, and from vice to virtue – if, that is, virtue is what perfects the substance of the soul; what receives its own perfection receives its own form, but what has received its own form, was previously in a state of privation of it before it received it. Hence it was well said in the *De Anima* that this kind of change in the soul is more like development than alteration.<sup>138</sup> 15 20 25 30

This kind of antithesis is observed in astronomical things as well. For even if they do not admit by turns now the form and now the privation, as things in creation do, nevertheless they do have the second <sc. the privation> dominating the substrate – meaning the <privation> relative to the form. And furthermore in the local motion of the heavenly bodies you do find each of these <sc. form and 129,1

privation> dominating in turn.<sup>139</sup> For the hemisphere in the region above the earth is evidently deprived of the one beneath the earth, and the same goes for each of the sectors.

Hence if the primary contrariety is one in the case of all substance, and the others are all subsumed under it, it is surely clear that the antitheses are neither infinite in number, nor finite but more than two.

Scholars ask, at this point, first what Aristotle means by ‘*genos*’ (class) here; second, in what way ‘there is one contrariety in each class’; and third whether the discussion here applies to all change, or rather – if it is about the most widely shared principles of all natural things together, but the other categories too, not just substance, are natural things – how come Aristotle thinks that by finding the principles of substance he has found the principles of all the things there are. For what he discovers amounts to just this: that in the case of substance, that being one class, the primary contrariety is one, which we said was the contrariety in respect of form and privation. So the exegetes say that here Aristotle means by ‘*genos*’ not ‘that which is predicated of things many and different in species in the category of “what it is”’, but rather the substrate. This is also one of the senses of ‘*genos*’ in Aristotle. For in many places he calls the substrate ‘*genos*’, including among his predecessors: he says that Democritus suggested that the atoms were one in ‘*genos*’, that is, in substrate. Hence here he takes substance *in toto*, not as divided into form and privation, but as the one substance underlying form and privation in turn, in the way in which we might say that all human bodies underlie white and black. So in this way we say that substance as a whole underlies and is receptive of the primary contrariety, that in respect of form and privation. Whatever other antitheses it is receptive of are subsumed under this one, whether you invoke that of animate and inanimate, rational and irrational, or whatever else. For whenever something becomes rational, evidently what has become rational formerly had the privation of the form of rational (e.g. the newly formed embryo) and then when the form of rational supervenes in the substrate, the privation departs – and the same in all cases.

But perhaps someone will say in response to this that ‘people who say that, what else are they saying than what we are saying when we speak of the *genos* predicated of several things? When I say “in every class of substance and encompassing substance as a whole”, what else do I mean than the most widely shared class? And again, subsuming the “rational and irrational” antithesis, or “animate and inanimate”, under privation and possession, which I am saying is the primary contrariety of substance, what am I getting but the class of substance that is divided into these things?’

My reply to this is as follows: that even if I get the same substance,



meaning the most widely shared, nevertheless they have different relations to the *differentiae*; it has been said, and well-said, that the classes both precede the *differentiae* in order of development and are simultaneous with the *differentiae* after their development; in the development of a human being, the first thing to develop in the matter is the body, and then in this substrate the creature develops as in a secondary matter, and then again the human form in that as the more proximate matter. Whence Porphyry says that the classes contribute the role of matter in relation to the *differentiae*. In this respect, then, they come first, but they are simultaneous with the *differentiae* in the things that have already developed. 10

So whenever we are taking the most generic things as those which contribute the role of matter, then we shall not say that they are divided into species in accordance with the *differentiae*, but rather that they are a substrate for the species, but when we are taking them as simultaneous with the *differentiae*, for instance in objects that have already developed, then we shall no longer say that they are a substrate <for the *differentiae*>, but that they are divided in accordance with them. Thus when we divide the genus, clearly we are dividing that which is predicated of several things, and which already exists and is simultaneous with the *differentiae*: we are virtually saying that this common nature belongs to both this species and that one. But in this case, when we are not engaged in dividing objects as things that exist, but in contemplating them as developing things, we shall say that the common class of substance *underlies* those contrarieties in accordance with which each of the existing things emerges, and that the most primary contrariety is that in terms of form and privation. Hence we shall say that the most primary principles of existing things, from which they get their being, are form and privation. 15 20 25

Hence it is also clear from this – from the fact that we are not referring to the genus predicated of several things – that I might also call the most specific form ‘class’ in this sense. For I would say that within the one class of ‘human being’ there is the contrariety in terms of knowledge and ignorance, or the one in terms of knowing and unknowing, meaning nothing other than that human being is a substrate for knowing and unknowing, which I would say is the primary contrariety belonging to it, *qua* rational human being. So it goes for our investigation of the first of the puzzles. 30

The second puzzle was how ‘there is one contrariety in every class’. My reply is that whereas in quantity there is either (a) discrete and continuous (but it must be recognised again that it is not as if quantity were *divided into* these things, but that it *serves as substrate* to them in the role of matter), or (b) excess and deficiency (for discrete quantities can be subsumed under excess, and the continuous under deficiency; for even if the same magnitude gets divided, 131,1



still the whole is encompassed as a whole by a larger place); in  
 5 quality, on the other hand, the most primary contrariety would be  
 that in terms of the rare and the dense.

It is obvious that the affective qualities<sup>140</sup> and the effects will be  
 subsumed under rarity and density; for all the rest end up under the  
 antithesis of hot versus cold and dry versus wet. All the other  
 10 qualities emerge from a mixture of these, and these clearly end up  
 under rarity and density – so those subsumed under these do too. The  
 four elements, which arise from an intermingling of these two con-  
 trarieties, plainly change into each other by rarity and density.

But capacity and incapacity, if these terms are to be used in the  
 case of affective qualities – e.g. having the capacity to warm up or cool  
 15 down or dry out or become wet, or change in respect of some other  
 quality, or the lack of capacity for that – evidently these too can be  
 subsumed under rarity and density, since the qualities to which they  
 apply are subsumed. But if ‘capacity’ and ‘incapacity’ are to be used  
 in the case of the rational capacities of the soul – I mean for instance  
 the ‘capacity’ for music or some other science or the ‘incapacity’ for  
 20 this – then, since the soul, when embodied, receives its various  
 aptitudes from its intermingling with the body, and the body is  
 constituted from the mixture of the affective qualities, quality in  
 respect of capacity and incapacity could also be subsumed in this way  
 under the affective qualities – and these have been shown to be  
 subsumed under rarity and density. But if we take the incapacity  
 25 with respect to irrational animals as well (for we say that the horse  
 has an incapacity for grammar) it is clear that here too such an  
 incapacity does not occur without this kind of mixture of affective  
 qualities; for it is not that just any soul enlightens just any mixture  
 of bodily elements; so because the rational soul is not naturally fitted  
 to enlighten that kind of mixture of irrational bodily elements, they  
 30 are said to have an incapacity for the rational sciences.

State and disposition will similarly be reduced to capacity and  
 incapacity; that which is ascribed to the affective qualities is obvious,  
 but that which applies to the psychological state and disposition in  
 respect of the sciences (is subsumed) *via* the aptitude derived from  
 the capacity of the soul ... more or less, the state and the disposition  
 35 emerge. But we have said that the soul acquired its aptitude and  
 132,1 inaptitude from its intermingling with the body.

The fourth type of quality, *viz.* shape and form, will be subsumed  
 under rarity and density as follows: shape, in that it has been shown  
 that among shapes of equal perimeter, the more polygonal shapes  
 have the greater volume and for this reason a spherical shape of  
 5 equal perimeter has greater volume than one with angles; so you will  
 subsume the spherical shapes under rarity and the angular under  
 density, since the same body rarefied will be larger and condensed  
 will be smaller; form, on the other hand, being a position of the parts

and a kind of extension would be rarefaction resembling the artificial rarefaction that is brought about by extension of the parts as it occurs in stretched elastic<sup>141</sup> or carded wool. In this way we shall subsume rarity as well under a single contrariety.<sup>142</sup> 10

So, since the remaining categories do not have an existence of their own, but have their being in these ones, it is clear that they too would be subsumed *via* those, once those have been subsumed under the most generic contrarieties. So while these things have to be said more for the sake of plausibility than truth, yet one contrariety should be considered more proximate for each class, that is for each category, namely the contrariety in respect of which loss and acquisition of the form takes place, and that contrariety is form and privation – but that would be the contrariety in the category of substance. But again this is just to prove the same point by means of the same thing, and to try to show that the primary contrariety in the case of substance is form and privation, and to take it once again for granted that in each class there is one contrariety, that in respect of form and privation, and for this reason it would be the same in the case of substance too. 20

But Aristotle demonstrates that there is one contrariety in each class in the following way as well. If there is one definition, he says, of each entity, whether universal or particular, and there cannot be two definitions of the same thing, it is clear that the definition will effect the development of that thing and the opposite of that definition its decay. So that if for any one definition the opposite is also one, there must of necessity be one contrariety concerning each of the things in respect of which development and decay occur. But it is not entirely possible to identify every contrariety by name, but it suffices that all of them be called by the common name of form and privation. 25

But Aristotle also demonstrates this fact, that each of the things would have its development and decay on the basis of one contrariety, yet he does not proceed to show that all the forms under the class, for instance the four forms of quality, are subsumed under some most widely shared contrariety that is proximate under quality, which is what the idea of there being one contrariety in each class implies. For ‘form’ and ‘privation’ are predicated in the same sense of every contrariety. 30 133,1

The third of the puzzles was how Aristotle thinks that once he has found the principles of substance he has the principles of everything, the rest of the categories included. The commentators say that, just as being extends primarily to substance, but then *via* substance to the rest of the categories (for they have their being in substance), so also form and privation belong properly in the category of substance, but, *via* it, in the rest of the categories as well. So that if form and privation extend from substance to the other classes by focal meaning,<sup>143</sup> it is reasonable that having found the principles of substance he would have the principles of all things. 5 10

These things would be consistent with the statements in the introductory sections,<sup>144</sup> to the effect that one must begin from things that are more common and indiscriminate. For showing that form and privation are already also the principles of everything is showing things that are common and indiscriminate, common in applying to everything, but indiscriminate in indicating nothing individual  
 15 about the individual principle of each. It is also posterior in nature, in being more common and assembled from the individuals.

In addition to these, Aristotle offers a third attempt by showing that the principles are not infinite. It is as follows: If (p) some contraries are prior to others,<sup>145</sup> he says, and the principles need to last for ever,<sup>146</sup> then (q) it is absolutely essential that the principles  
 20 be not only finite in number but also not more than two. But p; therefore q.

But let us investigate, in this inference, firstly what exactly it is for the principles to last forever, and secondly how the antecedent will come out true. Some people think that by 'principles' Aristotle means the celestial things, and that these are eternal. But the  
 25 discussion here is not about the efficient cause, but the formal cause, so he is not talking about celestial things.

Others say that by 'principles' he means the forms prior to the many: given that these permanently exist, they say, it is in this way that things down here come into being. But this is not true either. For firstly, Aristotle does not want there to be forms prior to the many; secondly he is talking about principles that are opposed and that mutually act upon and are affected by each other, and which by  
 30 their presence or absence effect creation and destruction. But the forms prior to the many are not like that.

Others say that he means what is extended in three dimensions: for this stays for ever due to being immutable. But this is not true  
 134,1 either. For the discussion is about formal principles, but this idea impinges more upon a discussion of matter, not a discussion of form.

My view is that the phrase 'last for ever' here means, for Aristotle, being found in every change and every change occurring on the basis of these. Just as if someone, seeking the material cause, said that  
 5 timbers are not the matter of things because they are not invariably found – for timbers subsist as matter neither in bronze implements nor in gold ones, but the matter that is common needs always to be found in everything, that is in every change and all things – so here too, seeking the most general formal principles of all existing things,  
 10 he says that they need to be always found – that is be the same for all natural things, and every change must take place on the basis of them.

As to how the antecedent could be true, next we have to show, that 'if some contraries are prior to others',<sup>147</sup> and 'some encompass and others are encompassed':<sup>148</sup> since we are seeking the common princi-

ples of all existent things, it is clear that we shall assume the most generic contraries into the definition of the principles. But because the principles 'must last for ever',<sup>149</sup> the same things will always be the principles and not sometimes one and sometimes another; and it follows by absolute necessity from these [premises] that they must be finite in number. For as a result of taking the most primary opposites, necessarily they must be finite. For if they were infinite, the things encompassed by them will be many multiples of infinity; for the things encompassed are more numerous than the ones encompassing. But even if it was necessary for the most generic ones to be finite in number, if it were not necessary that they be the same for every change, the same follows again:<sup>150</sup> even if they were not infinite as subsistent entities, yet they will be as developing things; for by continually adopting different contraries every time, the number of the principles turns out to grow to infinity.<sup>151</sup>

Hence, by both the hypotheses, the principles must necessarily be finite; and again by the very same hypotheses they must also be just two. For if they were not two, we should not get a contrariety that is maximally general and found to be the same in all cases. For it is necessary that these too must either be subsumed under some other contrariety or else there are not the same causes for all change, but this cause for one change and that cause for another. In any case, then, given that there are two contrarieties with respect to which the four elements have their origin, (i) hot and cold and (ii) wet and dry, changes into *all* the elements will not take place with respect to *both* the contrarieties. For instance, fire changes into air with respect to the dry and the wet, but not with respect to the hot and the cold; for both are hot. And again air changes into water with respect to the hot and the cold, but not with respect to the dry and the wet; for both are wet. Again water changes to earth with respect to dry and wet alone; for both are cold. Only in the case of change to the contraries does the change take place with respect to both <contrarieties>: fire and water, air and earth.

So it is not that changes to *all* of them take place with respect to *both* of the contrarieties; and hence if we are to find a maximally general antithesis among the elements with respect to which all of them change, it would perchance be density and rarity (for with respect to this occurs the change of all of them).<sup>152</sup> But if this is so, it is clear that it is not possible for two contrarieties to be the causes of all change. Hence it is necessary that the very first and maximally general contrariety, with respect to which every change occurs, must be one.

So much Aristotle himself indicates – that the formal principles are finite – by means of these considerations, and in addition, from these considerations, that if it is possible to produce the same results from finite principles as from infinite principles, then it is better to

- 15 do it from finite ones. For the definite is more elegant than the indefinite, and nature always chooses what is more elegant if it is possible, and it is possible to deliver the explanations of all things on the basis of finite principles, as Empedocles does.

- This much does Aristotle now indicate, as I say, that the contraries that are the formal causes of natural things must be finite, if indeed it simultaneously emerges from what has been said that there must  
 20 be one single contrariety that is first and maximally general, as we have demonstrated. But once he has engaged in discussion about the material cause in the next section, Aristotle will undertake this very same task and will demonstrate meticulously both that there must necessarily be just one contrariety that is the first – and that the substrate is one – and also that there cannot be more than one contrariety.<sup>153</sup>

### <5.2 Textual analysis and exegesis, 189a11-20>

**189a13** And there is one contrariety in every one class.

- 25 Themistius took Aristotle to mean, by ‘class’ (*genos*), that of which we make a division only into species and not into genera (*genê*).<sup>154</sup> So in respect of colour, the contrariety is one, namely dark and light; in respect of flavour, sweet and bitter.
- 136,1 But this is not in accord with Aristotle’s thinking; for he says that the one contrariety applies with respect to the entire class of substance (*ousia*), but the division of substance at its most general is not directly into species, but into subordinate classes. But contrariety is the relation of the two contraries.

### <Section 6, 189a21-b16: that matter is a third principle, besides the contraries>

#### <6.1 Exposition and discussion, 189a21-b16>

- 5 **189a21** But since they are limited, not to make them just two has some rationale to it.

- Aristotle has demonstrated at length that the contraries are principles and that the most basic things are contraries; and that the principles cannot be unlimited, because it is necessary to include the primary and most general contrariety in the definition of the principles; from which he showed that the principles were two, since the first contrariety is one. Since he now wants to introduce the third principle as well, i.e. the matter that underlies the contraries, he continues the discussion aporetically and argues dialectically for the contrary. He shows that the contraries are not adequate to be included in the definition of the first principle, but that the first principle must (a) not have any contrary and (b) be self-subsistent.

This is in order that from (a) the former premises whence he proved 15  
 that the principles must be contraries because things must change  
 (and they change into each other by acting and being acted upon in  
 regard to each other, and not just anything acts and is acted upon,  
 but the contraries) and (b) the present premises, to the effect that the  
 contraries cannot fully satisfy the definition of first principle, but  
 there must be something underlying the forms of the contraries, he 20  
 can infer both things: that *both* the substrate *and* the contraries are  
 principles.

So he argues dialectically in a number of ways<sup>155</sup> that the contrar-  
 ies are not principles, and first in the following way:

1. None of the contraries, he says, is such by nature as to act in  
 its own right upon its contrary; for rarity does not do anything  
 to density without some substrate (for their battle is about the  
 substrate, each of them wanting to take possession of it); nor 25  
 does the hot do anything to the cold. But neither does love do  
 anything to strife: for love does not gather strife together, nor  
 does strife divide love, but there is something else that serves  
 as substrate to them both upon which both love and strife act in  
 turn.<sup>156</sup> So the contraries are not principles all by themselves,  
 but rather the substrate is. For that is what changes and is the  
 explanation for the contraries acting and being acted upon.  
 Hence this should be the principle. 30

And in another way:

2. The contraries, he says, are in a substrate. But the principles  
 of substance (*ousia*) should not be in a substrate. So the contrar-  
 ies are not principles. But where does the premise that the  
 principles of substance must not be in a substrate come from?  
 From the fact that the substrate is prior by nature to what is in  
 the substrate and is the origin. For instance it is in this way that 137,1  
 substance, being substrate to the other categories, is prior to  
 them by nature and more origin-like. Hence if the contraries are  
 principles, but the contraries are in a substrate, but the sub-  
 strate is the principle of the things that are in it,<sup>157</sup> there will be  
 a principle of the principle. For, although the contrariety is a  
 principle, the substrate will be a principle for it. So there will be 5  
 a principle of the principle.<sup>158</sup>

Again:

3. The contraries are none of them underlying. The principles  
 ought to underlie. So the contraries are not principles.

Again:

4. The contraries are not substances. The principles of substance are substances. So the contraries are not principles. The premise that the principles of substance must be substances he demonstrates thus: if substance is composed out of non-substances, non-substance will be prior to substance; but non-substance is the accidents, so the accidents will be prior to substance, which is impossible. Quite the reverse, substance is prior by nature to the accidents (for it co-destroys but is not co-destroyed).<sup>159</sup> Hence if the principles of substance must be substances, and the substrate is substance (for it is self-subsistent) but the contraries are not substances, then the substrate and not the contraries are principles of substance.

- Someone might puzzle as to how come he says that the principles of substance must be substances; for the principle must be different from that of which it is a principle. And if the principle were substance (*ousia*) in one sense, and that which derives from the principle substance in another sense, why is the form not substance too, not in the same sense as the substrate, but in another sense? How come he says 'substance' in a broad sense for substrate and the matter, but for form not any longer? Indeed Aristotle himself says, in the second passage,<sup>160</sup> that it is rather the form that is substance. For it is the form in virtue of which things are characterised, whereas they do not differ at all from each other in respect of the matter. So it is clear that the sense of '*ousia*' intended by him is different. For he calls both matter, and form, and the combination, '*ousia*', and frequently he calls all of being simply '*ousia*', where '*ousia*' designates the mere existence of things. Here, therefore, he says '*ousia*' of the self-subsistent thing that does not have need of a substrate for its being, as he does also in the *Categories*.<sup>161</sup> Since, then, he is pursuing the discussion in an aporetic manner here, and the composite substance is self-subsistent and does not have its being in something else, for this reason, since the self-subsistent attains to substance more from the matter than from the form (for the form has need of a substrate for its existence, but the matter has no need of a substrate), for this reason he says the matter is rather the principle and cause of the composite substance. For even if the matter yearns for the form, still that is not so as to exist – in the way that the form craves the matter for its existence – but so as to be defined and ordered. This is the sense in which he used the term '*ousia*' of matter, because of what is self-subsistent, and he says that the principles of the composite substance (which is self subsistent) must themselves be self-subsistent too. For if the principles of substance were not self-subsistent, then what is not self-subsistent would be explanatory of what is



self-subsistent, and would be prior, which is impossible. On the contrary, what is self-subsistent is explanatory of and prior by nature to what is not self-subsistent, as substance to the accidents for instance. For it co-destroys but is not co-destroyed.<sup>162</sup> In this respect matter is substance more than the form is, but in another way the form is substance more than the matter is, because it is what is characteristic of the substance of each thing. For the matter is common. 15

Another thing worth puzzling over is how come he says that the principles of substance are not in a substrate and how come he says that the substrate is prior in the substance. For one will not assent to the former (for some of the principles are in a substrate) and will refute the latter (for there is never matter without form). 20

Well, my view is that even if there is never matter without form, never the less it is prior by nature. For it co-destroys but is not co-destroyed. For if we mentally subtract the forms from it, we can conceive of it in thought (for it does not stand in need of another substrate for its being), whereas the form cannot exist in isolation from the matter even in thought. And if god created things bit by bit, what would he have pre-established? It is clear that it would be what underlies and receives the forms, and then what was due to exist in it. So the substrate is prior in nature, and in this sense is rather more the principle of the composite substance – not that the form is not a principle, but, as I said, he is pursuing the argument aporetically, so that he may demonstrate that he inevitably needs the substrate for the definition of the principles. 25 30

In this way, then, he has established on the basis of argument that the substrate, the matter, is a principle. So if – says Aristotle – both the first claim, that the principles must be contraries, and also the second likewise, are going to appear to be true, one must assert the two in combination: that the contraries are principles due to the active and passive roles – and, thirdly, matter, since the contraries are not by nature such as to act by themselves upon themselves, but subsisting in something else. But nor on the other hand can matter alone be the principle; for matter is not productive of anything. So having shown, on the basis of the argument, that there must be a third principle, matter, he backs up this same conclusion on the basis of the testimonies of the ancients. The list of principles, he says, demands a substrate in this way, so that some of the more ancient <thinkers> did not make this substrate one either, but several: Empedocles the four elements, Parmenides two, others three, a different lot one. And of those who said one, some <made it> one of the four, others something else apart from these and intermediate between these. He approves of the ones who suggested that the substrate was one <more> than the ones <who say that it is> more than one. For he will say in due course that it is impossible for there 139,1 5 10



to be two materials, like <it is impossible for there to be> two contrarieties. But among those who said that the substrate is one, he approves of Anaximander, who said <it was> the intermediate, more than the rest, on the grounds that this <intermediate> is closer to matter because it does not have any form of the things that develop from it. After Anaximander, Anaximenes would be next most correct, in positing air as matter. For air has perceptible *differentiae* least of all the rest. Next after him Thales, positing water as matter. For this too tends towards the quality-less and endures through contrary effects. For the same thing gets hot and gets cold; and it melts and freezes while remaining the same thing. For it is wet and ‘not easily bounded by its own limit but easily bounded by another’. That is how the definition of the wet is given in the *De Generatione et Corruptione*.<sup>163</sup> And the same thing dries up, when it is frozen. For the dry is what is ‘not easily bounded by another but easily bounded by its own limit’.<sup>164</sup>

The ones who were least appropriate in giving their accounts of matter were the ones who said fire. For fire’s interaction with the other limbs of the contraries – I mean dryness and wetness – is most obvious, and hence it is incapable of changing into the contraries and remaining fire.

Having posited either one material or more, all these <thinkers> give form to the material by means of contraries – some by rarity and density, others by love and strife, others by various contrarieties, as described above.

## <6.2 Textual analysis and exegesis 189a21-b16>

5     **189a25** But both a further third thing ...

The term ‘gathers together’ (*sunagei*) is taken in common:<sup>165</sup> for neither does love gather strife together, Aristotle says, nor strife love, but both strife and love gather together or disperse some further third thing.

10     **189a26** But some take more than one and construct the nature of things out of those

Such was the contribution of the substrate to the definition of the principles that some of our predecessors even posited *more than one* substrate underlying the contraries.

15     **189a29** For of none of the entities do we see the contraries serving as substance, but the principle should not be said of a substrate. For there will be a principle of the principle.

It is possible both (a) to take the whole of this in a connected way, as a single syllogism, and (b) to understand it in a disconnected way as two syllogisms, in such a way that the phrase ‘for of none of the entities do we see the contraries serving as substance’ is one argument and the rest of it is another.

If (a) we take the whole thing as one argument, it goes like this: ‘in addition to these things,’ Aristotle says, a puzzle will follow for us if we do not posit some matter for the contraries; ‘for of nothing do we see the contraries serving as substance’ – that is, nothing is substantial in virtue of being contrary, since the contraries are attributes, but the principle of the entities *should not be said of a substrate* – that is, not *in a substrate* (meaning ‘attribute’). So the whole syllogism is as follows: the contraries are attributes; the principles of the things are not attributes; the contraries are not principles of the things. 20 25

But as to why the principles of the things are not attributes, he adds the reason next: ‘for there will be a principle of the principle’ – for the substrate underlying the attributes would be their principle; for the receptacle must pre-underlie by nature. And he says ‘than what is predicated’ because the attribute is predicated of the substance. For we say the person is white. 30

And furthermore if nothing is substantial in virtue of being contrary, because the contraries are attributes, it is clear that the contraries cannot be principles of substances either; for the principles of the substances will be attributes – but if so, and the principle of the attributes is what underlies them, there will be a principle of the principle, which is impossible. 141,1

So if the statement is continuous, this is how it is to be understood. But if (b) it is disjoined, it goes like this: ‘in addition to these things,’ someone might be puzzled, unless he were to posit a certain third principle for the contraries. What the puzzle is he goes on to say. ‘For of nothing do we see the contraries serving as substance.’ For nothing is substantial in virtue of this, in virtue of being contrary in relation to something else. For it is not in virtue of this that fire is substantial, in being contrary to water, since then it would never change into water, but there is something that remains in the change to water, which is not contrary to water. But if no third principle were to underlie the contraries, this is what would happen – that the things would be substantial in virtue of the contrariety. 5 10

Then the next bit <starts> from another beginning (*arkhê*): ‘but the principle should not be said of a substrate’ and so on. The principle is not <said> of a substrate; the contraries are <said> of a substrate; so the contraries are not principles. For if the principle is <said> of a substrate, there will be a principle of the principle; for the substrate is principle of what is in a substrate. 15

**189a32** Furthermore we do not say that substance is contrary to substance. So how could substance be from non-substances?

- 20 The contraries, Aristotle is saying, are not substances; the principles of substances are substances. So the contraries are not principles of substances. He shows where he gets the <notion> that the principles of substance are not substances by saying:<sup>166</sup> ‘or how could non-substance be prior to substance?’ effectively saying that the principles of substances are non-substances, but non-substances are attributes, so  
 142,1 the principles of substances will be attributes. But if these are the principles, the attributes will be prior in nature to substance, which is impossible. On the contrary, substance is prior in nature.

**189b3** But the intermediate seems more convincing.

- Those who posit the intermediate as matter are more on the right lines,  
 5 Aristotle is saying, than those who posit one of the four elements,<sup>167</sup> because the four elements ... the other limbs of certain contrarieties ..., but matter must not have any contrariety, as has been shown.<sup>168</sup>

**189b8** But all shape this one thing by means of the contraries.

- 10 That the ancients had not only got the notion of matter – even if not exactly correctly – but also that of the form-giving principles being contraries, all of which Aristotle reduces to excess and deficiency – so that the principles of entities are, he says, three: matter, excess and deficiency. All <the thinkers> said that these were principles, but they disagreed about their ranking and which is active and which  
 15 passive. For the Pythagoreans (followed by Plato too) posited the two as matter and said that this was acted upon by the one, the form, and that it brought about development in this way; but the natural philosophers who were earlier than Plato made the one, or the intermediate, or one of the four <elements>, matter, and said that this was acted upon by the dyad and brought about development and decay in this way. In this  
 20 respect Aristotle too has followed these thinkers.

**<Section 7, 189b16-190a31: that there is only one contrariety; the distinction between matter and privation as that ‘from which’ a thing comes>**<sup>169</sup>

**<7.1 Exposition and discussion 189b16-190a31**

**189b16** Saying that the elements are three would seem to have some sense to those who investigate on the basis of these and similar things.

Aristotle has sufficiently shown, on the basis of the earlier <materi-

als>, both that the principles must be contraries and that <there must be> a third thing, a substrate in addition to these. But concerning the number of principles, the things that have been said are not sufficient by themselves. For someone would be at a loss as follows: 'I grant that the principles must be contraries, and that there must be the substrate in addition to these, but maybe there are two or more contrarieties, and similarly maybe the substrates are two or more.' And while it is the case that it has not been sufficiently demonstrated that the primary contrariety must be one, by means of the foregoing premises alone, yet by means of the present ones Aristotle shows that it is impossible that there should be more than one contrariety or more than one substrate.

one contrariety	several contrarieties
one substrate	several substrates

Aristotle therefore takes the principles, both the formal principles and the material principles, on the basis of a binary classification, saying as follows: it is entirely necessary that there be either one contrariety among the principles, or not one but several; and similarly that there be either one substrate, or not one but several. From these four options, six pairs are generated, of which the two contrary ones are incoherent, but the remaining four are coherent – both the two that are one beneath the other and the two that are diagonal.<sup>170</sup>

For either both the contrarieties are several and the substrates are several, or the contrarieties are several but the substrate is one, or, vice versa, the substrates are several but the contrariety is one, or the substrate is one and the contrariety is one. Now if it were shown that the other three pairs are incoherent, the one remaining one – the one saying that the substrate is one and the contrariety is one – would be left. So Aristotle tests the one pair first, the one saying that the substrate is one and the contrarieties are several, and for the sake of clarity of the argument he takes two <contrarieties> in lieu of the several contrarieties; for the things shown in the case of two contrarieties would also be shown in the case of several.

If, therefore, the substrate is one but there are two contrarieties, we shall ask those who are proposing this whether each of the two contrarieties can give rise to everything, or whether one of them gives rise to some things and the other gives rise to others. On the one hand, if each of them can give rise to all things, one is surplus to requirements once the one is capable of giving rise to everything (but neither god nor nature does anything in vain or surplus to requirements). But if it is not the case that each does everything, but the one does these things and the other does those, we shall abolish change of things into one another (for not just any thing changes into just

any thing, but the contrary into the contrary). But it has been shown that change is of everything into one another.<sup>171</sup>

So in this way it is impossible for the contrarieties to be two but the substrate one; but if the substrates were two but the contrariety one, we shall encounter the same impasse again. For if everything  
30 can be derived from either of the two substrates, one is surplus to requirements, but if some things derive from the one and the rest from the other, then change from one thing into another will be abolished again; for just as things that are not contraries do not  
144,1 change into each other, so also things that do not have the same substrate would never change into each other. For this reason, whereas a *wax* horse changes into a *wax* figure of a man, a *bronze* horse would never change into a *wax* figure of a man.<sup>172</sup> So there cannot be two substrates and one contrariety, and for the same reasons nor can there be two substrates and two contrarieties. So if  
5 it is necessary that one of the four hypotheses is true, once three have been refuted, the fourth is left, the one saying that the substrate is one and the contrariety is one.

Geometers also use this kind of proof all over the place, wherever they are not able to use a direct proof; for by eliminating the branches that are marked off in opposition to what is the truth, they accept what is left as the truth. For instance, that the diagonal is either  
10 commensurate or incommensurate with the side. Having eliminated the commensurate, he accepts the remaining one as true, that it is incommensurate.

But Aristotle adds in addition what he had already said in the earlier passage,<sup>173</sup> that if there is one contrariety in every genus, then the primary contrariety in substance (substance being one genus) will be one.

Having said these things, Aristotle next enquires how many one  
15 ought to say these principles are in number, whether two or three. For according to one outlook or another it will sometimes seem to be necessary to say that they are three and sometimes two. For it is possible to say they are three: two contraries (the form and privation) on the one hand, and one substrate, matter, on the other. And it is possible to say that the principles are not three but two by compressing the three into the two: for some people refer the privation and the  
20 matter to the same thing, and consider that matter and privation are one and the same thing. So since Aristotle is engaged on the project of showing whether one should say that the principles are two or three, and if both two and three, then in what way one should say two, and in what way three, the task of determining first that matter is different from privation at least conceptually if not in substrate –  
25 this he does first, and shows in two ways that matter is different from privation: both (a) from common usage in language and (b) from the actual nature of things. First, (a) from common usage in language,

that in the case of privation we apply both the 'out of this' terminology, and the 'this' <terminology>,<sup>174</sup> for we say both that the musical person develops 'out of' the unmusical one, and that the unmusical person becomes musical; and that the non-philosopher became a philosopher, and that the philosopher developed 'out of' the non-philosopher. In the case of matter, by contrast, we do apply both types 30 of terminology, yet not to the same thing but for distinct aspects: we use 'out of' for one thing and 'this' for another. For, on the one hand, we do say that the statue is created 'out of bronze', not that the bronze becomes a statue,<sup>175</sup> and we do say that a human being is created 145,1 'from' the sperm and 'from' the menses, not that the sperm and the menses <become> human. But even if both kinds of terminology are used for both cases, still the 'this' terminology is more appropriate and natural for the matter, whereas the 'out of this' terminology <is more appropriate and natural> for the privation, because the matter endures when the form arrives, but the privation does not endure. So the 'this' language is appropriate to what endures, but the 'out of this' 5 language is appropriate to what does not endure.

But if the 'this' language is appropriate to the matter, because it endures, why then do we occasionally use both kinds of terminology in respect of the privation, both the 'out of this' language, and the 'this' language, but of the matter we use only the second kind?<sup>176</sup> My claim is that because we name the substrate from the privation, given that we include the matter too, along with the privation, in the expression – for whenever I say 'the unmusical' I do not simply 10 mention unmusicality, but the thing that partakes of unmusicality – since the expression signifies both what partakes and what is partaken, it makes sense that we apply both the terminology that is appropriate to the matter (namely the 'this' language) and the terminology that is fitting for the privation (namely the 'out of this' language) to it (<sc. to the privation>).

So, in the case of the privation, this is how it is. But in the case of the matter, since the expression does not have the privation included 15 in it (for when I say that the person becomes musical, the word 'person' does not have the privation – in other words 'unmusical' – implied in the expression; and when I say that Socrates turned white, the privation of white, i.e. not white, is not implied in the 'Socrates'), that is why we refer to cases of this kind with just the one kind of terminology, that the person became musical and that Socrates 20 turned white or became a philosopher, but we no longer also say that musical came out of person or philosopher came out of Socrates.

But if it is because of the fact that the privation is not included along with the matter in the expression, – because of that, we refer to the matter with only the one kind of terminology, why do we not 25 use the same terminology for all matter, namely 'this' – which we said was also more appropriate to it – but for certain matter we say only

‘out of this,’ which is more fitting for the privation? And even if the privation is not co-implied in the expression, in the case of matter, why do we not rather invariably designate matter <using terms> from the terminology that is appropriate for matter –and say that the sperm became a human being and the blocks <became> a house – but <instead, we say> that a human being <grew> *out of* the sperm and a house *out of* blocks?

Well, my answer to this is that whenever we say that something comes ‘out of’ matter, since we say it is coming not out of prime matter but out of the proximate matter, but the proximate matter does not endure in things that undergo change in respect of substance but is completely altered (for nothing of the sperm and menses endures), but the ‘this’ terminology implies what endures, for this reason we do not say ‘this’ in these cases, but rather ‘out of this’. For in cases of coming-into-being in respect of substance nothing of the proximate matter (in other words, the sperm and the menses) endures, besides the underlying prime matter and what is extended in three dimensions. For this reason we say not ‘this’ but ‘out of this’ in the case of all substantial coming-into-being. For we do not say that the wheat becomes wheat, but wheat from wheat and barley from barley, because the wheat that provides the specification of the seed and the matter does not endure when another wheat develops from it, but it changes in respect of its entire substance with nothing of the same thing enduring except, as I said, the prime matter and what is extended in three dimensions. So in cases of coming-to-be in respect of substance, for this reason, we say only ‘from this’, not ‘this’, and in such cases as are not changes in respect of substance but mimic the cases of coming-into-being in respect of substance; for the coming-to-be of the statue out of bronze is not a coming-into-being in respect of substance, but mimics the coming-into-being in respect of substance in a certain way. So for this reason, whenever the bronze is heated, or turns red or changes in some way like that, which resembles change in respect of attribute, we do not say that it has become red out of bronze, but we say that the bronze has become red and the bronze has become warm, because that kind of change is in respect of attribute. But when it becomes a statue or tripod or cauldron or something like that, we no longer say that the bronze has become a statue or cauldron or tripod, but that a statue and cauldron and tripod <have been created> *out of* bronze, since these cases are replicas of coming-into-being in respect of substance. And similarly with all cases of this kind – that a house <has been created> *out of* blocks and timbers, and the blackboard *out of* timbers. For something like a natural form seems to supervene in things of this kind.

So, whenever I say ‘red’ or ‘hot’, the matter that is receptive of this kind of thing is not co-implied. But just as when I say ‘human being’ or ‘horse’ we immediately think of the matter out of which it changed,



such as the sperm of such and such a kind out of which it had its origin, so too in the same way, whenever I say 'statue' or 'house', I immediately think of the bronze or the timbers and blocks. And just as in the former case nothing of the sperm endures except what is extended in three dimensions, so too in the coming-to-be of the house the form of the particular blocks seems to have been altogether changed and something else seems to have emerged from all of them. And similarly for the others.

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Since, then, the resemblance of cases of this kind to cases of substantial coming-into-being is great, this is why common usage deploys 'out of this' <terminology> for them in the same way, just as it does for the cases of substantial coming-into-being. And just as we say that air has come 'from water', not that water <has become> air, so also we say that a statue <has come> from bronze not that bronze <has become> a statue (for art imitates nature). And again, just as we say that the water becomes hot, not that hot comes from water, so also we say that the bronze becomes hot. For the change is in respect of quality, and the substrate endures. And in the same way for all the other cases.

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But it is worth noting that we do not simply use both kinds of terminology – both the 'out of this' terminology and the 'this' terminology – for every privation. For we would not use the expression 'the non-human-being becomes a human being', in the same way as <we use the expression> 'a human being comes from a non-human-being', but <we would use> only the expression 'from a non-human-being'. And while we say that house comes from non-house and statue from non-statue, we would not say that the non-statue becomes statue and the non-house becomes house. The reason for this is plain from what we said before. For given that, as we said, the 'this' <terminology> is appropriate to the matter, but is not always said of matter where it does not endure, so also whenever the matter is invariably included with the privation, since the matter that underlies the privation does not always endure, in these cases we say only 'out of this' with respect to the privation in the case of things whose matter does not endure, but we no longer say 'this' as well. For we say that the human being comes from a non-human-being, but we no longer say that the non-human-being becomes a human being – we designate the change on the basis of the privation and not on the basis of the matter in these cases. But in cases where the matter endures, then we designate the change both on the basis of the matter and on the basis of the privation. For we say both that the musical person comes from the unmusical and that the unmusical person becomes musical. And even though in the case of the statue the matter does endure, but one would not say that the non-statue becomes a statue, but only that out of non-statue has come statue, still this too is consistent with what has been said before. For because these changes mimic substantial

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changes, in which nothing of the proximate matter endures, for this reason just as it is not said that the non-human-being becomes a human being, so neither is it said that the non-statue becomes a statue.

30 Drawing together what has been said, then, my view is that in the case of the privation both kinds of terminology – both ‘out of this’ and ‘this’ – are said of the same thing (if not of every privation so be it, for they are of some), but in the case of the matter both kinds are never said of the same thing, but sometimes ‘out of this’, sometimes ‘this’.

So if in the case of the privation sometimes both are said of the same thing, but in the case of matter never both of the same matter but one or the other, it seems that the privation is different from the matter.

198,1 Such, then, is the discrimination of matter from privation on the basis of common usage, but they are also discriminated from the very things themselves,<sup>177</sup> in that the matter endures the approaching form in cases of change, but the privation, being opposed to the form, does not endure but yields to it. Whereas the human being endures ‘musical’ and ‘white’ and does not yield, ‘unmusical’ does not endure the approaching ‘musical’, nor does ‘not-white’ endure ‘white’.<sup>178</sup> And similarly for everything. So that if the matter endures the form, but the privation does not endure, these <sc. matter and privation> would be different from each other.

10 But if not all matter endures – for the sperm and menses do not endure the approach of the human form – that is not surprising. For first, if not all matter endures but there is *some* matter that endures, but no privation endures, that too is sufficient to reveal the distinction between them; and second, even if it is not the case that the proximate matter endures in all cases, nevertheless the prime matter and what is extended in three dimensions endures unchanged in the case of all things that change, but the privation never endures.

15 And furthermore, it is impossible that the matter – both prime and proximate matter – onto which the form impinges immediately, does not endure, in all cases; for it is part of the compound. So the distinction between matter and privation is obvious from the very things themselves as well.<sup>179</sup>

## <7.2 Textual analysis and exegesis, 189b16-190a31>

**189b16** Saying that the elements are three ...

20 We should take note of the fact that Aristotle does not say ‘Saying that the *principles* are three,’ but ‘Saying that the *elements* are three,’ which indicates what we were saying at the beginning, namely that while the elements are principles, the principles are not also elements. On the one hand, not only have we already shown that he calls

the elements – matter and form – principles, but also he will go on plainly to call matter and form ‘principles’ in what follows; on the other hand he has plainly shown that not every principle is an element in saying ‘Saying that the elements are three.’ For the principles are more than three; for there is also the efficient and the final.<sup>180</sup> 25

**189b18** With respect to being acted on, the one is sufficient.

<Aristotle proves> that there cannot be two substrates but one contrariety. For one substrate being acted on in turn by each limb of the contrariety is sufficient to bring everything about. 30

**189b19** But if, given four, there are going to be two contrarieties, there will have to be another intermediate nature apart from each. 149,1

Having considered the two substrates / one contrariety hypothesis, now Aristotle considers the remaining two options, (a) saying that there are two contrarieties but the substrate is one, and (b) saying that the contrarieties are two and so are the substrates.<sup>181</sup> But the statement is somewhat deficient in the text. One has to reveal the complete <sense> by understanding something additional from outside the text: ‘But if, given four, there are going to be two contrarieties, there will have *either* to be another intermediate nature apart from each, *or* one and the same <nature> for both the contrarieties.’ For if we do not understand this in addition, the argument no longer has any force. For it is not necessary that if the contrarieties are more than one then the substrates underlying them must be more than one. One and the same substrate could be receptive of several contrarieties: for the same thing is receptive of hot and cold, dry and wet, dense and rare, and a multitude of others. 5

The phrase ‘But if, given four,’ stands for ‘<four> limbs of the contrarieties’<sup>182</sup>; for if there are two contrarieties, their limbs will be four. 15

Aristotle says that the underlying nature – the matter, I take it – is ‘intermediate’. For it is as it were a common space for the battle of the contraries, and as it were the disputed territory.

**189b21** But if by being two they can generate from each other, the other one of the contrarieties is otiose.

The phrase ‘from each other’ does *not* mean the following, that one <contrariety generates> these things and the other <contrariety generates> those. Nor, however, does it mean that they can generate everything from themselves by embracing each other (as though the 20

contrariety of hot and cold, and the contrariety of dry and wet, <could generate> all the elements.)<sup>183</sup> It means 'Even if each of them can generate everything by itself.'<sup>184</sup> Aristotle shows that he means that by saying 'the other one of the contrarieties is otiose'. For if it is possible for one contrariety to generate everything, the other is necessarily surplus to requirements.

**189b22** And at the same time it is impossible for the primary contrarieties to be more than one; for substance is one genus.

5 A second argument, which Aristotle has already given in anticipation,<sup>185</sup> that (a) there is one contrariety in each genus, and (b) substance is one genus, and so (c) in substance there would be one most generic contrariety. For if the contrarieties are found to be more than one, then they will be referred back up to one most general contrariety, just as in quality black and white is the proximate  
10 contrariety of colour. Hence, even if the contrarieties do turn out to be more than one, the proximate principles of things that exist will also differ in species, but not in genus, and in the prior and posterior. For all of them will be referred back to the one most common genus that is the common genus of all the things that come after it.

15 **189b27** That the element is neither one nor more than two or three, therefore.

First, 'two', either (a) so that we take the substrate to be one and the contrariety to be one that encompasses the form and the privation, or (b) (which is more elegant) <one that encompasses> matter and form, because of the fact that the privation is not a principle, either strictly or in itself, but only incidentally, as Aristotle will go on to show in what follows. For because it exists in the underlying matter,  
20 the privation does not contribute anything in its own right to the process of becoming. For the things that are coming about do not require it, but the *absence* of it.

**189b28** But which of these, that is a great puzzle, as we said.

It is a puzzle, Aristotle says, whether one should say the principles are two or three. And it is clear that he is not just puzzled about the principles as such, how many they are and of what kind (for he has already revealed the answer to this, that they are three: two contraries and one substrate), but also whether one should call the principles that we have found *three* by counting the privation too, or *two*, because the privation is not strictly a principle for the reasons given.  
151,1  
5 'As we said' – just now, evidently. For he said 'That the element is neither one nor more than two or three, therefore'.<sup>186</sup>

**189b30** This is how we express it, embarking on development as a whole.<sup>187</sup>

Since Aristotle wants to show whether one ought to say that the elemental principles are two or three, first, he says, one ought to say how developing things develop. We shall find this advantageous towards the current investigation. 'For it is natural to state the common things first, and then consider those that are proper to each individually.'<sup>188</sup> For the knowledge of universals always precedes knowledge of the more particular. Thus when he wants to explain the differences between syllogisms, he first explains what syllogism is as a whole; for someone who does not know what a syllogism is will never come to know what a demonstrative syllogism is. But he proposes to do this from the beginning – to begin his exposition from things that are more common. And from this too you can gather the purpose of the work under discussion here, namely that it is about the adjuncts that accompany all things that develop and decay. 'Development as a whole,' he says, not just substantial development, but development in respect of attributes too. And it is clear that this is another source of evidence for what Aristotle said at the beginning, how one should begin from universals, as being more evident and more accessible to perception – meaning by 'universal' not the common genera and things far removed from the particulars, but the particulars that fit more than one thing.<sup>189</sup> In the same way here too he says one should speak about development *simpliciter* because it is natural to begin from things that are more common. And he embarks in the text on the particular types of development. For there is no development *simpliciter*, since there is no common genus of being, but just as 'being' is a homonymous term, so also is 'development'.

One might perhaps wonder why, if Aristotle is here talking about adjuncts that accompany all natural things *simpliciter*, and is asking now how many principles there are of those (whether two or three),<sup>190</sup> he now asks, with a view to finding that out, how all *developing* things develop, so as to be able to find out the number of principles from those things. For natural things are not just things that develop; there are also some uncreated natural things; I mean the heavenly bodies.

My view is that Aristotle is constructing his discussion in relation to things that are more evident, things that develop and decay, but he moves the discussion on from these to things that do not develop. In any case, when he sums up this argument, he sums up with reference to all things *simpliciter* by saying: 'It is apparent that, if there are causes and principles of things that exist by nature, primary <causes and principles> out of which they are or have developed ... that all things develop from (a) the substrate and (b) the form.'<sup>191</sup> Hence, even if for the sake of clarity he examined things that

develop and decay, with a view to the study of principles, nevertheless he shows that there are the same principles for eternal things as well; for the principles of eternal things are principles of their being  
 15 in just the same way as the principles of created things are principles of their development.

**189b32** We say therefore that one thing comes from another and a different one from a different one, either speaking of simples or of composites.

When we speak of coming ‘out of something’, we are saying ‘out of either something simple or something composite, Aristotle is saying.  
 20 And again we speak of the developing thing as becoming either simple or composite. For example when I say that the person has become musical, or that the unmusical has become musical, I am saying that from something simple – the person or the musical<sup>192</sup> – something simple (the musical) has developed. But when I say that a musical person has come from an unmusical person, I am saying that composite has come from composite. For the unmusical person  
 25 is composite too, composed of the unmusical and person, and what has developed is the musical person. But it is also possible to take the first as simple and the second as composite, as when I say ‘Out of an unmusical person has come a musician,’ or when I say ‘Out of the unmusical has come a musical person.’ Sometimes I take the thing from which it comes as composite, sometimes the thing that develops, and the other as simple.

153,1 **190a2** So I refer to person and the not musical as the simple developing thing, [and the musical as the simple thing that develops.]

At this point ‘developing thing’ refers to the substrate, but later ‘developing thing’ refers to that towards which the change occurs.<sup>193</sup> But what ‘develops’ is the form, as the examples show. What he is saying is this: ‘I call it *simple* development, whenever both the  
 5 developing thing and what develops are simple, and *composite* whenever both are composite.’

**190a5** For the first of these we do not just say ‘this develops’ but also ‘out of this.’

Having said how the developing things develop, that it is either simples from simples or composites from composites, Aristotle now wants, as he has said, to say how these simples, from which the developing things develop – or in his words, the ‘developing things’<sup>194</sup>  
 10 – differ from each other – that is to say, *person* and *unmusical*. For it

might be that they are just two names signifying one and the same thing.

It is from this point that the distinction between matter and privation begins. Aristotle first distinguishes these on the basis of common usage, on the grounds that (a) in the case of the privation we do not just use the 'this' terminology (that 'the unmusical becomes musician') but also 'out of this' (that 'from unmusical comes musician'), but (b) in the case of the matter <we use> either the 'this' terminology or the 'out of this' terminology by turns (for distinct aspects).<sup>195</sup> 15

**190a9** And of those which develop as we say the simples develop, one develops while enduring.

Aristotle has already drawn a distinction between matter and privation on the basis of common linguistic usage. Now he draws a distinction between them on the basis of their actual nature. This is a real distinction, to the effect that the matter endures in the process and does not get out of the way for the form, whereas the privation does not endure but yields when the form arrives. 20

He puts in 'as we say the simples develop' because composite development contributes nothing towards his project of distinguishing matter from privation. For when we take the matter and the form together, saying 'the unmusical person', how could we distinguish the matter from the privation in this case? For we are designating the developing thing by one name, 'unmusical person', in exactly the same way as we also designate what develops by the <term> 'musical person.' But it is obvious that the composite thing does not endure at all here. For the musical person does not endure, as Aristotle himself says. 154,1 25

**190a13** Once these have been distinguished, it is possible to grasp this from all developing things, if one looks, as we say – namely that something must always underlie the developing thing. 5

Aristotle has shown how developing things develop, and distinguished the matter from the privation. In what follows he shows whether one should say that the elements are two or three, which was the topic he proposed at the beginning. He says that once the analysis of developing things has been carried out, it is possible to deduce from all these developing things (if one applies one's mind to the entirety of developing things) the following conclusion: that there must necessarily be something which is to receive the process of change. But this is the *matter*. 10

This, however, Aristotle says, is numerically one, but conceptually

<it is> not one but two. For being a person is one thing, being unmusical is another. Hence, in the process of change, the person endures, whereas the unmusical does not endure.

- 15 So if it is necessary that in every case of development something must underlie, the developing thing, and, on the other hand, there is also something that develops (this is the form), and the underlying thing is numerically one but conceptually two, then the elements will be in one way two and in another way three – numerically two but conceptually three.

- 20 And if one of those things, the privation, does not endure, but the elements, strictly speaking, are those things that come to form part of the object, then it is clear that the elements, strictly and *per se*, would be two. For the other one is not an element *per se* but *per accidens*.

**190a16** By ‘in form’ and ‘in specification’ I mean the same thing.

- 25 Since Aristotle has said that the matter and the privation are numerically one, but not one in form, lest anyone should understand him to be saying that the matter and the privation are the same in form, it is for this reason that he says that ‘I say “in form” meaning “in definitional specification”.’ And he explains that matter and privation are not one in specification by recalling the distinctions made earlier once again.

- 155,1 **190a21** To say something comes ‘out of something’ and not that it ‘becomes this’ is more usual for things that do not endure.

- 5 <Aristotle means> that even if both ‘out of this’ and ‘this’ are used of both the matter and the privation, yet ‘this’ is used more of the matter, and ‘out of this’ is used more of the privation. And in the case of the matter, one or the other expression is used severally, whereas in the case of the privation both expressions, ‘out of this’ and ‘this’ are used of the same thing. But one should not think that when he says that both are used of the privation he means that both are used in every case of privation, but rather that in the case of some privation both are used. For we have shown that in the case of the privation of substantial forms the ‘this’ terminology is not used but only the ‘out of this’ terminology.

**<Section 8, 190a31-b23: that substantial change  
requires a substrate>**

**<8.1 Exposition and discussion 190a31-b23>**

**190a31** But since ‘becoming’ has a number of meanings, and some things do not *come to be* but *become this something*, and only substances *come to be, simpliciter* ...



Aristotle has shown that among the principles of natural things there needs to be not just contrariety – because acting and being acted upon is not a matter of just anything on anything but only contrary on contrary – but we need a substrate as well on which the contraries will work in turn. But as illustrations of the need for a substrate in all cases, he took no cases of substantial change but only cases of change by alteration: that a musical person develops from an unmusical person with person being the substrate for both the unmusical and the musical; and the bronze becomes a statue. Since then these changes are not substantial changes but changes in respect of quality, Aristotle now wants to show that there must be some substrate in cases of substantial change too – a substrate round which the contraries bring about the development and decay of the substances by acting on each other. 15

For it is obvious that things that change in respect of the other categories change round a lasting substrate. Things that change in respect of quantity, to take a straightforward example, such as things that grow, were previously such and such things and that is how they grow. For the one who does the growing is a human being, or a plant or something else. The same for what gets smaller. And similarly for things that change in respect of quality. For what is turning white or warming up is a body. And similarly for what is changing in respect of place. For the thing that is getting up high or down low previously is such and such a thing. And similarly what becomes a father or right or left must previously be a human being or an animal or a body.<sup>196</sup> So it is clear that things that change in these categories must exist prior to the change. 20 156,1 5

In the case of things that change in respect of substance, on the other hand, this does not seem to be so easy to see, because substance is not said of any substrate as the other categories are. But there is a substrate for the change in this case, none the less. For plants and animals plainly have their origin from the seeds, and metals that can be melted plainly have the moist as their substrate. But in general the substrate for all natural things – by which I mean the things involved in development and decay – is the four elements, around which, as they mix, the natural forms are engendered. 10

And the substrate of the elements themselves, and of absolutely everything, is the three dimensional. This is quality-less body, around which the changes occur while it remains unchanged like body, with the substantial qualities acting and being acted upon around it. A demonstration of the fact that the second substrate is immutable like body has been provided by us in the *Summikta theorêmata*. 15

Aristotle divides all the things subject to development into five <groups>, so as to show that there is invariably a substrate in all the types of development. Some things that develop, he says, do so (a) by 20



change of shape, (b) some by addition, (c) some by subtraction, (d) some by combination, (e) some by alteration.<sup>197</sup>

(a) The ones that develop by change of shape, he says, are either the ones that do so by changing in respect of alteration (that is the ones in respect of quality), or the ones that change in respect of the fourth species of quality, the shape and the figure, like the statue.

25 For nothing else varies in the bronze, except the shape and the position of the parts.

(b) The ones that develop by addition, he says, are those that change in respect of quantity. For what grows does so by addition (in fact by nutriment) but by addition not of what is of the same substance<sup>198</sup> (for flesh does not grow by the addition of flesh), but by the moisture from the nutriment flowing round to the body parts, as explained in the *De generatione*<sup>199</sup> – that is how the change gets to the body parts and that is why growing things need more nutriment as well.

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(c) By subtraction develops either (i) – as Aristotle himself says – the Herm from the stone (for when some bits of the stone are chiselled off, this is how it develops), or (ii) in the case of natural things too, as in those that waste away and things reduced due to dispersal.

157,1

(d) <Something> develops by combination in the case of artefacts, like the house and the bed. For the house is completed in virtue of nothing else but the combination of the blocks and the timbers, and the bed in virtue of the combination of the parts. In these cases the craftsman merely makes the materials serviceable and puts them together, nothing else. But there are also things that develop by combination in the case of natural things; for nature combines (i) the elements for the purpose of developing the uniform parts and (ii) the uniform parts for the purpose of developing the organic parts, and (iii) the latter for the purpose of developing the whole creature, if it is the case that, in these things too, such and such a form accrues from without to such and such a combination, as in the case of artefacts.

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But things that are similar are said to ‘combine’, not things that are dissimilar. So you would not say that the surface is combined in the solid. For the solid is not a combination of solid and surface, nor is the surface <a combination> of surface and lines, but line is said to combine with line, and surface with surface and solid with solid.

10

Thus you would not strictly say that the matter and the form combine, but that the form occurs in the matter. So in this sense we say that the elements are simples, since no combination of similar things is observed in them, but <only> a concurrence of dissimilar things, form and matter.

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(e) Things that change in respect of substance are the ones that Aristotle says develop by alteration, because the whole substrate

alters and changes, and none of it survives with its form intact. In the development of the creature nothing of the form of the sperm and the menses survives, but all of it is transformed and changes. 20

So, development occurs in five ways and the substrate, round which the change occurs, is found surviving in all of these: in things that change shape, the bronze and things like that; in things that grow, the animal, the plant; in things <that develop> by subtraction, the stone; in things <that develop> by combination (as in the house), the blocks and timbers; and in things that change and are transformed in respect of substance it is the body itself and what is extended in three dimensions. 25

Hence, from what has been said, it should be clear that in everything that develops, just as there is a contrariety in respect of which the developing things develop, so there is invariably also a substrate round which the contraries effect the development and decay, by acting and being acted upon. 30

One can also observe these five modes of development in the case of things that change in respect of substance. For nature not only combines the elements with each other, but also alters and transforms them, and thus makes the sperm from them, and from that (altered again) <nature makes> the blastocyst,<sup>200</sup> and then grows it there and finally shapes it. But you might say that nature carries out subtraction in these cases too; for whatever there is in the sperm and the menses that is residue and not contributing to the development of the creature, all that is taken away. 158,1

So, from all that has been said it is clear, says Aristotle, that every developing thing is a composite of substrate and form.<sup>201</sup> But the substrate is twofold: (a) what is antithetical to form, which also yields to the form (this is the privation), and (b) what endures the form and admits it when it approaches (this is the matter). And the 'developing thing' is the matter, but 'what develops' is the form.<sup>202</sup> 5

## <8.2 Textual analysis and exegesis, 190a31-b23>

**190a31** But since 'becoming' has a number of meanings, and some things do not *come to be* but *become this something*, and only substances *come to be, simpliciter* ... 10

It has often been said that Aristotle uses the term 'come to be' by itself for the development of substances, and '<becoming> something' for the development of attributes, because in the case of things that develop in respect of substance we say simply that 'a human being was born' but in the case of development in respect of attribute we do not say simply that it came to be, but that it became something.<sup>203</sup> The person became pale, or musical. On the one hand it is evident in the case of 'becoming something' that there is invariably a substrate. 15

By contrast we have to investigate if this is so in the case of development in respect of substance as well.

**190a34** And relative to something else ... <sup>204</sup>

Relative things have their essence in being of other things, and being said of other things. That is why he said 'relative to something else' in this way when he wanted to say 'relative things'.

20 **190a35** Because of the fact that only the substance is not said of any other substrate, but all the rest <are said> of the substance.

That it is obvious that there is a substrate for the development of attributes is confirmed on the basis that they cannot exist at all apart from some substrate, and this is the substance. But since the substance is not said of any substrate, it would seem that the development of the substance is not from a substrate.

25 **190b1** But that both the substance<sup>205</sup> and whatever other entities simply have being develop from a substrate [would become plain to one who looked closely].

After saying 'the substance' he ascends to something more general, that 'simply all' developing things as well <sc. develop from a substrate>. For he is going to show generally, for all developing things, that there is invariably a need for a substrate. But he divides the things that develop into five modes, as I already said,<sup>206</sup> for all of which he demonstrates the need for a substrate. We have been through them all severally.<sup>207</sup>

30

159,1 **190b11** [So that it is clear from the things that have been said] that every developing thing is always composite, [and there is one thing, the developing thing, and then there is what becomes this.]

Composed out of the substrate and the form, of which the former is becoming the form and the latter is what the matter becomes. For the matter is said to become what the form <is> in virtue of admitting it. But whereas above he said the 'developing thing' was the substrate,<sup>208</sup> here he says 'the developing thing' is the form. 'For there is a thing,' he says, 'the developing thing' (this is the form), 'and there is what becomes this' (this is the matter). For that becomes what the form <is>.

5

**190b12** And this is twofold: either the substrate or the contrary.

And the substrate itself is conceptually composite, he says. One aspect of it is antithetical to the form (this is the privation); the other underlies and endures the onset of the form, and, with the latter, makes up the composite. 10

**190b17** It is plain that if there are causes and principles of the things that are by nature, first things from which they are or have developed not *per accidens*, but each what is said in respect of the substance ...

It is clear, Aristotle says, that, if the principles of the things that are by nature are those things which inhered at first and out of which each thing develops and completes the essence of each, that these are the things out of which each is composed – out of the substrate and the form.<sup>209</sup> For these are the things that compose each of the natural things in the first place. So if the things that compose <each thing> in the first place are <its> principles, and the form and the substrate compose <the thing>, then these would surely be principles of all natural things. 15

**190b18** ... primaries out of which they are or have developed ... 20

‘Are or have developed’ is well said. ‘Are’ <applies> to the heavenly bodies and the elements as a whole, ‘have developed’ <applies> to all the particulars that develop and decay.

**190b18** ... not *per accidens*, but each what is said in respect of the substance ...

The statue might also be said to be composed of red bronze, but out of red <only> *per accidens*. And just as there is the *per accidens* in the case of matter, so also in the case of form. For the <attribute> ‘three cubits tall’ is said to be cause *per accidens* of the three cubits statue.<sup>210</sup> For it makes the statue *per se*, but <it makes it> three cubits tall *per accidens*. 25 160,1

**190b20** For in a way the musical person is composed out of person and musical; for you will break down the specification<sup>211</sup> into the specifications of those.

That the musical person is composite is confirmed by analysis: the things out of which each thing is composed, those are the things into which it is broken down. For you will analyse the specification of musical person into the specifications out of which it is put together 5

– I mean person and musical. For the definition of musical person is analysed into the <definition> of person and the <definition> of musical.

10 But there is also a reading ‘into the definitions’.<sup>212</sup> For the musical person is analysed into the person and the musical <one>.

‘In a way’ is not a pointless addition, but because the things that are put together are either bodies or at any rate self-supporting objects. But musical is neither a body nor self-supporting, but in a substrate.

**<Section 9, 190b23-191a22: on matter and privation;  
per se and per accidens principles>  
<9.1 Exposition and discussion 190b23-191a22>**

15 **190b23** The substrate is numerically one but formally two.

Aristotle has shown from two points of view that the privation is different from the matter, from linguistic expression, and from the very nature of the things. Now he proposes to show how they stand with respect to being principles: whether matter and privation are principles in similar ways, and in what way in each case.

20 So in order to find this out he asks first how they stand with respect to being. For however they stand with respect to being, evidently that is how they will be disposed with respect to being principles.

What is a *certain this* and countable is an entity in the strict sense – but it is clear to me that the discussion relates to natural things – and in the strict sense what is a *certain this* and countable is the composite. For this can be pointed out.<sup>213</sup> Where then does the composite get its <property of> being a *certain this* from? He says that it is from the matter rather than the form, because the form is immediately destroyed once it is isolated from the matter, but the matter remains; and the former would not subsist without matter, whereas matter, even if it never is without form, all the same as far as its own specification is concerned it would exist even apart from form. So the composite would get its <property of> being self-supporting from the matter rather than the form. And this is what we say is the *certain this* and countable. And this *certain this* and countable  
25 <thing> is the entity (*to on*). So matter is an entity, and an entity in the strict sense, but privation is not countable nor a *certain this* (because it is indeterminate), so that it is not an entity in the strict sense either. But whereas *per se* it is a non-entity (in so far as an entity is a *certain this*) yet it is an entity *per accidens*, because it is in the entity – that is, the matter.

30 So if matter is an entity *per se* and in the strict sense, whereas  
161,1 5 privation is a non-entity *per se*, but an entity *per accidens*, and as

these stand with respect to being<sup>214</sup> so they stand with respect to being principles, then it is clear that matter would be a principle in the strict sense and *per se*, and privation <would be a principle> *per accidens*. And in general among entities (a) some are just non-entities,<sup>215</sup> (b) some are just entities, and (c) some are entities in a sense and non-entities in a sense: (a) just non-entities are the ones that in no way and in no sense are;<sup>216</sup> (b) just entities are the forms, because it is not in their nature to be entwined with the privations (for contraries do not entwine); (c) entities in a sense and non-entities in a sense are matter and privation, but while the matter is *per se* an entity, and *per accidens* a non-entity, because the not-being (i.e. the privation) is in it (whence it is also clear how the form is just an entity), the privation by contrast is *per se* a non-entity, and *per accidens* an entity.

So as they stand with respect to being, so presumably they will stand with respect to being principles. So matter, which is an entity *per se*, would also be a principle *per se* and a principle in the strict sense, whereas privation, since it is an entity *per accidens*, would be a principle *per accidens*. For the privation contributes nothing to the being and existence of the object, but only by its own absence does it collaborate towards the development of the object.

After saying these things, Aristotle sums up the things said so far, to the effect that it is clear from all that has been said so far, first, how many principles there are and, second, what they are: that in a way they are three and in a way two; for properly speaking the principles are two, matter and form – for these are the things that together make up the objects and which collaborate in order that there be those objects. But you might say that in a way the principles are three, because the privation too collaborates in a way towards the development of the object. For something that is going to take on a certain form must earlier be deprived of this form and then afterwards discard the privation and thus receive the form.

So it is clear in what way there are two principles and in what way three. Similarly, you would also say that the principles are in one way contraries and in another way not contraries. For in as much as not just anything is affected by just anything but the contrary by the contrary, in this respect it would be reasonable to say that the principles are contraries; but since the contraries are not in themselves such as to act and be acted on by each other, it would seem that the principles ought not to be contraries, but that it suffices that one of the contraries gives rise to the objects by its absence and presence.

But Aristotle has solved the seeming conflict by saying that we need both (a) the contraries and (b) the substrate, but one of the contraries with the substrate as the things that comprise the *substance* of the object, while the other, namely the privation, only *per accidens*.

After saying these things, next Aristotle suggests how it is possible to achieve knowledge of matter. We need to be aware that Plato, writing before Aristotle, says that there are two ways to attain knowledge of matter.<sup>217</sup> One is by a process of elimination (*aphaire-sis*), when we say that matter is what is neither a horse nor a human being and in general no body at all, but something else besides these, which underlies all of these. In this way, he says, we can also get to know the first cause.<sup>218</sup> For one cannot say anything positively about it, but we hit upon knowledge of it on the basis of elimination, by saying 'what is not a body nor a soul nor a mind nor another thing, but something else besides these and surpassing all of them'. For this reason he says that matter is and is not like the first <cause>. It is like it because in both cases we obtain the notion by elimination of all the things that exist, but it is unlike because in speaking of matter we say it is not any of the things that exist but something else inferior to all of them, which is also a substrate of all of them, whereas the first <cause>, being none of the things that exist, is superior to all, and surpassing all of them.

So the likeness is unlike, for the process of elimination (of the one towards what is superior and of the other towards what is inferior) is the similarity in formlessness, but in different ways, because the former (<the first cause>) is above form whereas the latter (<matter>) is inferior or beneath the form.

This, then, is one way <to get to> knowledge of matter. The other is by analogy. This is also the method that Aristotle uses here, <when he says> that the relation that the bronze has to all the bronze artefacts, and that the timbers have to all the wooden artefacts, is the same relation that matter has to all the things that exist. If we were trying to describe the nature of wood to a blind person, we would lead him to the idea of wood by saying that wood is that which is neither a bed nor a door nor a blackboard, nor any of the other wooden things, but what is underlying all these things and which does not itself have any form of this kind in its substance but is naturally fitted to take on all of them. In the same way, we shall be brought to the idea of matter by saying that what is none of the natural forms, but underlies and is spread beneath all these – that is matter.

Hence Plato said that matter is grasped by a 'bastard reasoning',<sup>219</sup> because it is impossible to put one's finger on the essence of matter and know what exactly it is, but we get an idea of it from the elimination<sup>220</sup> of the other things and by analogy. And <it is possible to get> to the idea of the first cause, for which they say that the one and only image is the sun, in the same way.<sup>221</sup> For the other powers, in that they have more particular activities, they made images as analogies for the activities of each, but in the case of the first and most causal <cause> of all, they found the sun <to be> the one and



only natural image. Just as the sun transcends all the things that are within the cosmos, so in the same way the first <cause> transcends all the things that exist with an incomparable transcendence. And just as the sun lights up all things, so the other (sc. the first cause) makes all things good by a single act, while each thing partakes of its good-making activity in the proportion to its own measures, just as things that are receptive of the solar light partake of it according to their capacity, while it lights up everything by means of a single activity. 10

## <9.2 Textual analysis and exegesis 190b23-191a22>

**190b23** The substrate is numerically one but formally two.

Aristotle has just said that ‘everything develops from both the substrate and the form’, and has incorporated all the things that develop under these two principles. This substrate, he says, is not straightforwardly one. Rather it is numerically one, but conceptually two. For it has the privation in it, which is different from the matter conceptually. For you will give one definition of the matter and another of the privation, as for person and unmusical. But whether each of the components that make up this one substrate is a principle of the composite in the same way, or not in the same way, Aristotle will reveal in what follows. 15 20

**190b24** For person, and gold, and, in general, the matter, is countable. For it is more of a ‘this something’, and what develops out of it not *per accidens*.

Given that he has said that the substrate is numerically one but formally two,<sup>222</sup> Aristotle wants to demonstrate just that, and to conclude from that how each stands with respect to being a principle. So he says that matter is countable; for it is a *this something* (*tode ti*). For the person, who is a *this something* and countable, is matter for the musicality, and the plank is matter for the bed. On the other hand it is not possible to call unmusicality or shapelessness a *this something*, because it has neither definition nor subsistence. For a *this something* is an entity, but what is not a *this something* would not strictly be an entity. So this is the distinction between them, and it is from here that you derive how each of the two is a principle: for since the matter is a *this something* and completes the composite it would be a principle *per se*, but the privation is not *per se* – for it is not seen in the composite, nor is it a *this something* of the composite like the matter – yet it would be a principle *per accidens* because it is an accident of the *per se* principle, by which I mean the matter. 25 30 164,1 5

Aristotle first says ‘person, and gold,’ and then moves up to the universal by adding ‘and, in general, the matter’.

- When he says ‘more of a “this something”’ he either means ‘the matter is more of a this something than the form’, or, as we have already said, the comparison <is> with the privation, that compared with the privation, the matter is more of a ‘this something’.<sup>223</sup> The latter is my view, because of the first.<sup>224</sup> For that <sc. the matter> is not countable *per se*, but still it is more countable than the privation. Because the matter survives and collaborates more with the composite (which is strictly a *this something*) and is observed in the composite, while the privation disappears on the arrival of the form, the matter is more countable than the privation.

- 15      **190b27** But the privation (and the contrariety) is accidental.<sup>225</sup>

When Aristotle adds ‘and the contrariety’ it is not supposed to mean something else besides the privation, but both refer to the same: ‘the privation which is also contrariety’.

**190b28** But the form is one, such as the arrangement or music.

- 20      This is continuous with ‘but the substrate is numerically one but formally two’ above,<sup>226</sup> and then next ‘but the form is one,’<sup>227</sup> but the bits in between are support for the former claim. So Aristotle says that whereas the substrate is conceptually two, it is not that the form is likewise. Rather the latter is both conceptually and numerically one. But if the form is one, it is clear that it is both countable and a
- 25      *this something*, and in one respect the form is more of a *this something* than the matter (for it is in respect of that <sc. the form> that each thing is called a this something, e.g. human being, horse); while in another respect the matter is more of a *this something* than the form, if every *this something* is self-subsistent and not subsisting in something else. But the thing that is self-subsistent is what is composed of the matter more than what is composed of the form, if the form cannot exist without matter, but it is possible to conceive of
- 165,1      the matter without form, as in the bronze without the forms of the artefacts. And as far as its own specification goes, the matter subsists in itself; for it does not have need of the form for its existence, but for its organisation.

- 5      **190b29** Hence in one sense we should say that the principles are two, and in another sense, three.

Two: either matter and form as we said, or the contraries. And if it is the contraries, then what is added next, ‘and in one sense as the contraries and in another sense not’ would seem to be in keeping; in

that because development and decay occur by acting and being acted upon, the contraries will seem to be principles (for the contraries are the things that act and are acted upon), so that the contraries are two principles. But then again, it will seem that the contraries are not principles, because the contrarieties are not themselves in themselves such as to act upon each other. But this puzzle too we resolve, says Aristotle, by supplying a third nature beneath the contraries, around which the effects and the developments and decays <take place> and which is not itself a contrary. So it is clear from these considerations that in a certain respect the contraries and the substrate are three principles, and in a certain respect form and matter are two – and this form will effect development and decay by its absence and presence.

**190b35** So that in a way the principles are not more numerous than the contraries.

Aristotle is not saying this, that only the contraries are principles, but that numerically the principles will not be more numerous than the contraries in a certain way, that is in respect of quantity. 'More numerous' stands for 'they are not more than two in a certain way.' And it is clear that this is what he is saying from the material he adds next: 'but, so to speak, just two in number – not two in every way because the being belonging to them is different.' For even if the matter and the form are also two principles, yet since being is not the same for matter, for in one respect it has what it is to be matter and in another respect it has what it is to be deprived of the form. \* \* \*<sup>228</sup> he also uses examples to persuade us: for being a person is one thing, he says, and being unmusical is a different thing. That is why after acquiring musical education, one is still a person, but no longer unmusical. For the privation yields to the form.

**191a3** How many are the principles of natural things relevant to development has now been stated.

Aristotle does not just say 'of natural things', but 'natural things relevant to development' in order to avoid including the heavenly bodies. For among the heavenly bodies privation does not enter into the principle-account, but only the form and the substrate. He said 'relevant to development' for that reason, and 'natural things' because of things that are subject to choice. For in respect of those things there is no investigation into either matter or form (unless by analogy – for instance the matter of the syllogism is the premises and its form the conclusion).

- 15      **191a5** And that the contraries are two ...

Reasonably enough. For the contrary is contrary to something, and nothing is contrary to itself.

For the form, which occupies the place <vacated by> the privation, will effect decay when absent, and development when present. So just one of the two contraries incorporated into the principle-account along with matter is sufficient.

- 20      **191a7** But the underlying nature is known by analogy ...

From this point Aristotle is suggesting the way <to> knowledge of the matter, that it is 'by analogy'. We have said above that Plato also uses the way based on elimination.<sup>229</sup>

**191a11** In the same way does the latter stand to substance and 'this-something' and being.

- 25      Aristotle has moved up to the more generic in saying 'and being' after saying 'to substance and "this something"'. For matter is substrate to substance, and evidently for that reason it underlies the attributes. His reasoning would go as follows: the matter underlies the substance, the substance underlies the attributes, so the matter underlies the attributes as well
- 167,1

**191a12** So on the one hand this is one (*mia*) principle, but not one (*mia*, feminine) in this way, nor one (*hen*, neuter) like the 'this-something'.<sup>230</sup>

- 5      Once again Aristotle does a count of the principles. So the matter is one (*mia*, fem.) principle just to this extent, but even though it is said to be one (*mia*, fem.), still it does not qualify as being one (*hen*, neut.) thing and countable in the way the 'this-something' is. The latter is the composite (for this is the particular and the thing that is properly countable). For even if we said that the composite gets its status as a this-something from the matter, still the composite is more of a this-something and countable. And that is no wonder, since even if
- 10      bodies get their status of being passible from the matter, (for bodies are like this due to the matter being suited for that), yet considered in itself matter is wholly impassible.

- But it is also possible to take the phrase 'not one (*mia* fem.) in this way, nor one (*hen* neut.) like the "this-something" with reference to the form, so that it says that the form is the 'this-something' – for the essence of each thing is according to the form – so as to take the word 'one (neut.)' and 'this something' rather with reference to the form.
- 15      This is because the form is always one and the same, admitting no

alteration, but the matter alters in intricate ways, and changes according to its different reception of the forms. So insofar as the form remains the same but the matter alters in intricate ways, in this way he says that the form is more one than the matter is. But we said above that in another way the matter was more of a this-something than the form,<sup>231</sup> in that the matter does not need another substrate in order to exist, as the form needs the matter, but is self-sufficient as regards subsisting by itself. But in an earlier passage<sup>232</sup> it was also stated how in a certain way the matter was more of a this-something, and again in a certain way the form. 20

**191a13** But one (fem.) the (fem.) the (masc.) specification (*logos*).

The *êta* and the *omicron* are both definite articles together.<sup>233</sup> And (as often stated) Aristotle calls the form ‘specification’ (*logos*) here. So 25  
having spoken of the material principle, he now speaks of the formal one too, and he says that the form too is one principle. But he listed the two articles for the same thing, insofar as the specification is feminine *qua* principle (*arkhê*) but masculine *qua* specification (*logos*). For this reason he listed the two articles, both the feminine and the masculine, for the same thing – the feminine for the principle and 168,1  
the masculine for the specification, as though he had said ‘but the other principle is the *logos*, that is, the form.’

**191a15** First of all then it was said that the contraries are a principle ...

From this point Aristotle sums up all that has been said and ‘how the principles stand to each other,’<sup>234</sup> that some of them are *per se* 5  
principles and some *per accidens*; and the matter and the privation are numerically one but conceptually two, while the form is one both numerically and conceptually. And the former is analogous to the female and the latter to the male. And whatever else he has said about them.

**191a19** But it is not yet clear whether the form or the substrate is substance ... 10

Aristotle refers this inquiry to the *Metaphysics*, where he investigates whether the form is substance or not, and in what sense the form is principle, and whether every form is imperishable or there is a perishable one too, and if not every form is imperishable, how every one is a principle.<sup>235</sup> To sum up briefly what he says there about this matter let us say this: he says that each of the two <sc. form and 15  
matter> has some claim over the rest to being more substantial; for the matter is more substantial than the form because the matter is

a self-subsistent object whereas there cannot be form without matter (while matter has no need of form for its being). But then again the form is more substantial than the matter, because the matter is arranged and ordered and defined by the presence of the form, while the form defines and arranges, and because entities are each characterised not according to their matter but according to their form. Hence in one respect the matter is more substantial than the form, and in another respect again the form is more substantial than the matter.

**191a20** But that the principles are three, and how three ...

25 ‘And how three’ stands for ‘three of what kinds’, i.e. matter, form, privation.

**191a22** ... and what is their mode [is clear].

169,1 We said that some are *per se* principles and some *per accidens*, and that the matter is the substrate whereas the form is what arranges and defines the matter, as the form of the statue does with the bronze.

### <Section 10, 191a23-b35: resolution of the ancient puzzles about change>

#### <10.1 Exposition and discussion 191a23-b35>

**191a23** Next after this we shall explain that this is the only way to solve the ancients’ difficulties.

5 It is testimony of arguments well and scientifically presented whenever the arguments presented about the subject are such that they adequately reveal the nature of the subject and resolve the difficulties that are brought against it. And such are the arguments presented by Aristotle concerning the principles of physical objects. For on the one hand he has adequately revealed for us the most general principles of physical objects, and by means of these we shall resolve the difficulties brought against those things – which is what Aristotle now does. Difficulties are brought concerning physical objects which we have already noted in the arguments against Anaxagoras.<sup>236</sup> These are the difficulties that eliminate coming into being.

15 For while they were ‘seeking the truth’ about objects, says Aristotle, people long ago ‘took a wrong turning from the truth’ by their inexperience in dialectic, and they thought that there was no coming into being at all.<sup>237</sup> For if something comes into being, say they, it either comes from being or from non-being. But it cannot come either from being (how could being come into being? It would be before it

came into being) or from non-being (for it is impossible for anything to come into being from something that does not pre-exist). And this is a common view among all the natural philosophers that nothing comes from what in no way is.<sup>238</sup> For the thing that is due to come into being must previously have some capacity and fitness for coming into being. For if a thing were not capable of coming to be before it came to be, it would not come into being. So it is necessary that it have some capacity for coming into being before it comes into being. But what has a capacity for coming into being is a being, and the capacity itself. So nothing comes from what in no way and no sense is. So it seems that there is no coming into being at all. For this reason, having eliminated coming into being, they made objects by separation and combination and positioning of these sorts.

And, says Aristotle, starting out from that beginning, they went on to eliminate the plurality of things as well. For 'once one absurdity has been granted', as he says,<sup>239</sup> myriads will follow. For, from the point at which they eliminated coming into being, on the basis that non-being could not be the substrate, from which they come, in the case of things that come into being – for if non-being were the substrate, it would turn out that non-being has being – from there they went on to eliminate plurality too. For if there is plurality there is also difference, and if there is the latter, then there is also non-being. For Socrates *is not* what Plato is. Hence Socrates is a non-being. For he is not Plato. But he is also a being: for he is Socrates. So the same thing will be both a being and a non-being, which is impossible. But if this is impossible, then it is impossible for there to be plurality among things. So being is one and unmoved.

Well, those thinkers eliminated coming into being as a result of inexperience in the dialectical method. They did well in their investigations into coming into being, and developed the argument by way of classification, and the <procedure of> classification by contradiction: they said that if something comes into being it comes either from being or from non-being (for being and non-being <constitute> a contradiction). But they did badly in that they did not employ the contradiction to the full: for 'being' does not signify just one thing, and nor (similarly) does 'non-being'. So they ought to have made a further classification of these things, and thus reviewed all the limbs of the classification, to see if coming to be could occur in respect of one of them.

For 'being' is a homonymous term, and so is 'non-being' likewise. Nothing is being *simpliciter*. Nor is there a common nature of being, but it is a homonymous term predicated in several categories: being is either substance or quantity or quality or one of the others. Similarly 'non-being' does not signify one simple thing, but either what is not *simpliciter* (which is none of the things that are) or what is not something. For substance is not something: it is not what



20 quantity is or what quality is. And in the same way each of the others is both being and non-being in respect of one thing or another, one thing that it is and another that it is not.

So those <thinkers> slipped into this absurdity due to their lack of experience in the method of classification, so that they were forced by their argument to abolish things that are obvious – *viz.* coming into being and plurality. But Aristotle resolves the puzzle on the  
 25 basis of the arguments just given concerning the principles: for it was said that some of the principles (matter and form) are *per se* principles, and some are principles *per accidens* (privation). Aristotle resolves the puzzle on the basis of the *per se* and the *per accidens*, and on the basis of the potential and the actual. For if something comes into being *simpliciter*, it is clear that it would come from non-being  
 30 *simpliciter*. But now in this case it is what *becomes something* (for nothing comes into being *simpliciter*). But if it is what becomes *something*, it is clear that it also comes from what is *not something*; for just as what is *simpliciter* comes from what is not *simpliciter*, so  
 171,1 too what is *something* comes from what is *not something*. So what is *simpliciter* cannot come into being: for it would come from what is not in every way, and here their argument is sound. But since what comes to be does not come into being *simpliciter* but *becomes something*, the thing it comes from will be *not something*. But what is *not*  
 5 *something* is also something; and this is a composite of matter and form; for everything that is actual is a being of that sort. So when we say that what comes to be comes from what is, e.g. fire from air, we are saying that the fire comes from a *per se* being (air: for air is a *per se* being) but not coming *per se* from what is, but *per accidens*. For we  
 10 said earlier that what becomes *part of the developing thing* is the *per se* principle, as the matter and the form. If, therefore, the air does not become *part of the fire*, it is clear that the fire has not come *per se* out of what is (<i.e.> air), but that it so happened that what it came from  
 15 *per se* had the form of air. For the airy form contributes nothing to the development of fire. In fact fire comes no less from water and earth and all the compounds. So if we consider <something> coming from matter, it comes from this as from a *per se* being – for the matter is a *per se* being – and *per se* as out of what is; for the matter becomes  
 20 *part of it*. And this is nothing absurd; for it does not become just what the matter is, but it is one thing and it becomes another.

But those thinkers did not think of coming to be from matter, but they brought out the puzzles in particular changes: that air is seen to become fire, so if it is air, and this comes to be fire, then *what is* comes to be.

Well, our view in response to their puzzle is this: that even if it comes from air, still it is not that it comes from it *qua* air, but <only>  
 25 *per accidens*, because the substrate happened to have the airy form. Hence even if the thing that comes to be comes from what is, still it

comes from that being not insofar as it is a *being* but only insofar as that from which it *per se* came (i.e. the matter) happened also to be a being (that is, <happened> to have been already formatted).<sup>240</sup> And again, whenever we refer to coming to be from non-being, it is not that what comes into being comes from it insofar as it is *non-being*; for the privation of fire does not become part of it. So we say that the fire comes from non-being, but not from non-being *simpliciter*, but from not being something (for it comes from not fire) – but it does not come *per se* from not-fire, rather <it comes> *per se* from the substrate (but we say that the fire comes from non-being, because the substrate has the privation of fire, which is *per se* non-being) and *per accidens* from non-being. And if we consider the proximate change, it is clear that the privation of fire is in the air; for the air is ‘not-fire’, that is ‘not-being-something’. So it comes from ‘not-being-something’ not *per se* but *per accidens*. The only way in which it comes to be *per se* is from the substrate and the matter. But if it both comes from a *per se* being, the matter, and it does so *per se* as from being, the inference that the thing that is coming into being is there already before coming to be comes out as absurd.<sup>241</sup> For the thing that was there already does not come into being, but one thing is there and another comes into being. Like the bronze, in becoming a statue, does not come to be what it was, but one thing is there and another comes into being, so too in the case of all things that come into being naturally, whenever we consider their coming into being from matter and what is extended in three dimensions, this is what turns out to be the case.

So for all cases of coming to be, there is <coming> from prime <matter> and <coming> from proximate <matter>, both <coming> from what is and <coming> from what is not, and this is not a contradiction. For it is not from what is and from what is not in the same respect, but from what is (on the one hand) in as much as it is a different thing, but from what is not (on the other hand) in as much as this is not what develops. But in the case of coming into being from matter, it comes from *per se* being, but not from *per se* non-being (for the privation does not become part of the developing thing, like the matter). But in the case of proximate change, such as when fire comes from air, it does not come as from *per se* being, nor as from *per se* non-being, (for neither the air nor the privation becomes part of the fire), but it is both from being and from non-being and *per accidens* that fire comes from air, but *per se* it comes from matter, which is something else, in the manner we have described.

In one way, then, the puzzles are thus resolved on the basis of the notions of ‘*per se*’ and ‘*per accidens*’, the very things that Aristotle has employed in the discussion of the principles. For he said that some of the principles are *per se* (matter and form), and the privation is *per accidens*.<sup>242</sup> Hence ‘what it comes from’ is not invariably ‘the *per se* being it comes from’, but also ‘the *per accidens* being <it comes> from’.

30 So the puzzles have been solved on the basis of the account given of  
 the principles. But he also resolves them on the basis of the potential  
 and actual. For given that things are some of them potential and  
 some actual, when we speak of coming to be out of what is, we mean  
 173,1 from what potentially is but actually is not. And similarly when <we  
 speak of coming to be> out of what is not, <we do not mean> out of  
 what in no way and no sense is, but out of what is not in actuality but  
 is potentially. For matter is all the natural forms potentially, but  
 none in actuality, because it would not ever exist at all without the  
 forms.

5 Potentially and actually are not the same thing as *per se* and *per  
 accidens*, however. For it is possible to be potentially and *per se*, and  
 potentially and *per accidens*, and likewise actually and *per se*, and  
 actually and *per accidens*. (a) When I say that the doctor is practising  
 medicine I say <something> in actuality and *per se*; (b) when I say  
 that the doctor will practise medicine I say <something> potential  
 10 and *per se*. On the other hand, (c) when I say that the doctor is doing  
 construction work, I say <something> in actuality and *per accidens*  
 (for the doctor does not do construction work *qua* doctor, but only in  
 so far as while he was a construction worker he happened also to be  
 a doctor; so we say *per accidens*, of a construction worker who does  
 construction work *per se*, that the doctor is engaged in construction  
 work, because the doctor and the construction worker are one in the  
 underlying subject; and (d) when I say that the doctor will do con-  
 struction work, I say <something> potential and *per accidens*.

15 So it follows that, on the one hand, things that come to be come  
 from matter, which is (a) *per se*, but (b) only potentially, not actually,  
 because matter does not subsist in itself in actuality apart from  
 forms. Rather by its own specification it is *potentially everything but  
 actually nothing*, since what is said to subsist in actuality is what has  
 already been formatted. On the other hand, they also come from  
 privation, which (a) is not actually, but (b) is potentially.

20 So what is the difference between matter and privation, if in both  
 cases it comes from things that are potentially but are not actually?  
 <The answer is> that in the case of matter the being is *per se*, for  
 matter is being *per se* and not-being *per accidens*, because it happens  
 to have the privation, but in the case of privation the reverse is true:  
 the *per se* applies to the not-being and the *per accidens* to the being.

25 For privation is not-being *per se* but being *per accidens*, because it  
 happens to be in matter.

30 So if what comes to be comes from what is potentially but is not  
 actually, then clearly the developing thing was not there before it  
 came into being. For it was not actually. And then again when we say  
 that what is comes from what is not, we do not say that it comes from  
 what in no way and no sense is, but from what is not actually but is  
 potentially. Hence the puzzles are also resolved by way of the poten-

tial and actual, and this type of resolution is what the arguments given concerning the principles deliver. For when the privation inheres in the matter, it makes it be potentially, not actually. For since what takes on this form is also naturally capable of taking on the privation, and what was not also naturally capable of taking on the form would not take on the privation, as it says in the *Categories*,<sup>243</sup> for this reason, since the privation is in the matter, surely it is also natural for the form to be in it as well. So, since it is natural for it to be in it, but is not in fact <there> (for the privation and the form cannot both be <there> at once), for this reason it is said to be potentially and not actually. 174,1

But what is surely noticeable is that we here get the privation changing into the form, and not just the possession <changing> into the privation (and not vice versa) as in the *Categories*. This is because there we were dealing with possession and privation occurring in an already formatted thing, but here we are reflecting on the formless and primary substrate becoming form and privation. 5 10

## <10.2 Textual analysis and exegesis 191a23-b35>

**191a24** For the first to enquire philosophically into the truth [and the nature of things ... ]

Aristotle says ‘first philosophically’ not meaning first in order of merit but chronologically first. And he says ‘the truth and the nature,’ meaning ‘the truth in nature’. 15

**191a26** They took a wrong turning as though beaten off course down another road due to inexperience ...

‘Due to inexperience’ of dialectic, Aristotle is saying, they took a wrong turning from the road to truth. Had they known how to chart the ways in which ‘being’ is said, and also ‘not being’, and again ‘*per se*’ and ‘*per accidens*’ and ‘potentially’ and ‘actually’, they would not have thought that it was impossible for a thing to come both from what is and from what is not. 20

**191a30** And nothing would come from what is not; for something has to underlie.

Something – out of which it comes – always has to underlie the thing coming into being. But it is not possible for non-being to underlie being. For being and non-being would be in the same <place>.<sup>244</sup>

**191a31** And in this way by increasing the consequence that came after ... 25

Always increasing the consequences that follow upon the given absurdity, Aristotle is saying. For once one absurdity is granted a myriad follow. And they eliminate plurality from things by saying that being is just one – such are the thinkers associated with Parmenides and Melissus.<sup>245</sup>

**191a33** So those men adopted this view for the reasons stated.

- 30 The ‘view’ is the one that says there is no coming to be, and eliminates  
175,1 plurality from things, due to thinking that non-being cannot ever in  
any way have existence. Because of this nothing could come from  
non-being. Nor could there be plurality among things, because being  
would turn out to be the same as non-being.

**191a34** But we say that there is coming to be from being or from non-being, or that non-being or being does something or is affected.

- 5 When we resolve the puzzle, we say that being and non-being are said  
in two ways, Aristotle is saying: either *per se* and *per accidens*, or  
potentially and actually. And he provides the following example of  
the first way. We say that the doctor is practising medicine (he says)  
and then again we say that the doctor is doing construction work, but  
we say that the claim that the doctor is practising medicine is *per se*  
(for he practises medicine inasmuch as he is a doctor) and the claim  
10 that the doctor is doing construction work is *per accidens*, because it  
so happens that the doctor is a construction worker. For it is not *qua*  
doctor that he does construction work, but *qua* construction worker.

- And as in the case of the doctor doing something, one action is *per se*  
and another is *per accidens*, so also for being affected. For we say  
that the doctor becomes a non-doctor, and then again we say that the  
doctor turns grey. But it is *per se* that he becomes a non-doctor (for  
15 he becomes a non-doctor inasmuch as he is a doctor), whereas he  
turns grey not inasmuch as he is a doctor but inasmuch as he is dark,  
because it so happens that the doctor is dark. For this reason when  
*what is dark turns grey the doctor* is said to turn grey *per accidens*.

- So just as things are with the doctor, so also with being and  
not-being. We speak of coming from being and from not-being; but  
not *per se* from either being or not-being, but rather *per accidens*. A  
20 being coming to be from a being is nothing absurd, one being from a  
different being (for being <is> in manifold ways), but not inasmuch  
as it is a being, but inasmuch as it is *per accidens* a being. And  
similarly from a non-being not *qua* non-being, but *qua per accidens*  
a non-being. For the same being would not come from the same being  
25 even *per accidens* (e.g. water from water). However, a different being  
would come from a different being *per accidens*.

But we have already talked about these things with more precision.<sup>246</sup> So this is the point of these sayings. But the points about the linguistic usage, since it was said above<sup>247</sup> that in the case of privation we apply both terminologies (both the 'out of this' terminology and the 'this' terminology), whereas in the case of matter, while we do apply both yet we do not apply both to the same case, but 'out of this' in one case ... For we say that the human being develops out of the sperm and the menses, but not that the sperm and the menses become a human being; whereas we say the bronze becomes a statue, but not that the statue develops out of bronze.<sup>248</sup>

Since, then, we apply both the 'out of this' terminology and the 'this' terminology to matter and to privation, it is for this reason that Aristotle now uses both terminologies both for being and for not being. 'Now we say,' says he, 'that <there is coming to be> "from being" or "from non-being" ...':<sup>249</sup> notice the expression 'out of this' <applied> both to being and to non-being. And then again he brings in the 'this' terminology for the same things: 'either non-being or being does something or is affected', he says.<sup>250</sup>

After he has said 'that there is coming to be from being or from non-being' Aristotle goes on to make the discussion more inclusive: 'either being or non-being does something or is affected', he says. Doing and being affected covers more things than coming to be. For while coming to be is also a form of being affected, the changes in the other categories are not cases of coming to be, but some are just cases of doing or being affected. Only change in respect of substance is a coming to be.

But since 'becoming' is also used more inclusively to apply to every change (for we also say becoming white, or becoming above or below) Aristotle proceeds, for this reason, to extend it to be more inclusive: after he has said 'either being or non-being does something or is affected' he adds 'or becomes some particular thing', so that we understand what has been said not only in connection with substantial becoming, but also with becoming in respect of quantity and quality and coming to be in a place.

**191b2** So that since this is said in twofold ways ...

Namely, the doctor acting or being acted upon. For he is said to act either *per se* or *per accidens*, and similarly the being acted upon is either *per se* or *per accidens*. For both the acting and the being acted upon are examples of the same thing, namely the *per se* and the *per accidens*. So just as in the case of the doctor the acting and the being acted upon are said in twofold ways, either *per se* or *per accidens*, so also the case of coming to be from what is or from what is not, and the case of non-being or being coming into being, these too would also be said in twofold ways, either *per se* or *per accidens*.

177,1 **191b6** But since we most properly say that the doctor acts in some way or is acted upon ...

Aristotle has just said that coming to be from what is or from what is not is said in twofold ways, as also is becoming something from a doctor. Now he determines which of the two meanings is most properly said in the case that is before us. And he says: just as the doctor is most properly said to act in some way or be acted upon, whenever he acts in some way or is acted upon *qua* doctor (e.g. when he practises medicine, or becomes a non-doctor), so also coming to be from what is or what is not, or what is or what is not becoming something, would, he says, be properly said whenever what is not, *qua* what is not, becomes something<sup>251</sup> – that is, whenever it becomes something different while surviving and remaining. Then something would properly come to be from what is not, whenever non-being survives and takes on being in that way. Which is impossible. But whenever non-being gives way to being, then it is no longer *properly* ‘from what is not’, but <only> *per accidens*.

So the earlier thinkers did not distinguish these two meanings, Aristotle is saying, and thought that whenever something was said to come from what is not, it was properly coming into being from what is not – for <sc. so they supposed> there is no meaning of ‘from what is not’ other than the proper one.<sup>252</sup> And for this reason, he says, they shied away from supposing that there is any becoming at all, and declared that *nothing* comes to be.

**191b9** ... it is clear that the phrase ‘coming into being not from what is’ means this too, ...<sup>253</sup>

Not only does the phrase ‘properly what is not’ mean this, namely ‘*qua* what is not’, but also the phrase ‘properly what is’ means ‘*qua* what is’.<sup>254</sup>

**191b10** A distinction which those thinkers failed to make, and hence gave up.

They failed to divide being into the *per accidens* and the *per se*.

**191b12** none of the others ...<sup>255</sup>

i.e. that there is no plurality but that being is just one, and none of the other things besides being exists. But these would be the things that are ‘not something or other’, which they say ‘are not’.



**191b15** For from the privation, which is *per se* non-being, 178,1  
something comes into being that was not in there before.

We too ourselves, says Aristotle, say that there is coming to be from non-being, but not *per se* from non-being, but *per accidens*. For it comes from the privation which is *per se* non-being, but it does not come *per se* 5  
from the privation (for the privation is not there in the developed thing), but *per accidens*. The only *per se* coming to be is from the matter.

But it is also possible to say of coming to be from the matter that it is coming to be from non-being, because the matter is *per accidens* non-being due to the fact that the privation resides in it. And in this way it is also possible to say that there is non-being in the developed things, but not the non-being that is *per se*, but only the non-being 10  
that is *per accidens*, matter, to which non-being is accidental.

**191b17** This too is surprising, and it seems in this way too that coming to be from what is not is impossible.

Given that Aristotle has just said ‘we too ourselves say that there is coming to be from non-being, but not *per se* out of non-being, but *per accidens*,’ he now says that this itself seems to be surprising and impossible, for something to come from non-being, but it will not any 15  
longer seem impossible according to our hypotheses.

**191b18** But nor even does what is come from what is, except *per accidens* in this very same way.

This is continuous with the earlier ‘but we say that nothing simply comes from what is not, but nevertheless we do say that it also comes from what is not *per accidens*,’<sup>256</sup> and then ‘But nor even does what is come from what is, except *per accidens*, in this very same way.’<sup>257</sup> In 20  
just the same way as we say it comes from what is not, Aristotle is saying, but not *per se* from what is not, but only *per accidens*, so also the things that come into being come from what is only *per accidens*. This applies to elementary development. Fire comes from existing air, although *per accidens*, but from what is, because it happened that what 25  
turned into fire was air.<sup>258</sup> We’ve already indicated in what way ‘*per accidens*’, due to the fact that the airy form contributes nothing towards the development of the fire (after all, fire also comes from all the other things), and that the air does not become a part of the fire, but clears off.

**191b20** As if animal were to come from animal and some animal from some animal.

Aristotle now confirms, by means of the examples, that whenever we say that being comes from being, it is not in virtue of the fact that the 179,1

thing from which it comes has being that we say that it comes from that in this way, but *per accidens* from being. For, he says, we say that animal comes from animal, but here we use the expression 'from animal' to mean from the material cause, since that is the topic of discussion in this case. For we do not mean it in the manner of

5 'human being from human being' (meaning as efficient cause), but rather in the manner of wasps <coming> from a horse, and bees from a bull.<sup>259</sup> For horses are the source of wasps and bulls of bees. So whenever we say that animal comes from animal, e.g. wasps from horses, obviously we are not saying the following: that *qua* animal the horse changes into animals, namely wasps (for the horse does not serve as the underlying matter for the wasps). Rather, we are saying

10 the following: that from one thing which happened to be an animal, another thing develops to which being an animal also happens to belong.

So in the same way also, if water were to come from air, we say what is comes from what is, <meaning> not that what is there already comes into being, nor that the developed thing is there before it develops, but that from something of which being is predicated, another thing, which also exists, develops *per accidens*.

15 Since nothing comes from animal simply *qua* animal, but the thing that develops is invariably some animal, Aristotle adds (after having said 'if animal were to come from animal') 'and some animal from some animal'.

**191b22** For a dog would not just come from some animal, but also from animal: not *qua* animal – for that is already there.<sup>260</sup>

Just as it is true to say that some random dog or wasps or whatever come from a horse, so it is true to say that a dog comes from an

20 animal. But if we also say that animal comes from animal, the animal has not come from animal in the way that we speak of that from which it comes *qua* animal. For if what it came from developed thus, *qua* animal, it would not have developed. For it was already there, in that from which the animal came. So it is clear that the way in which the animal comes from it is not *qua* animal but *per accidens* from animal, as we have said.

25 **191b23** But if there is going to be an animal that develops not *per accidens*, it will not be from animal.

If it develops from a certain animal, not *per accidens* from that <animal> but *per se*, it will not be a thing developed from animal but

180,1 from not-animal, e.g. from the sperm or from matter. So just as in these cases, Aristotle is saying, so also in the case of being, if there were to come to be something that simply is, it will not come from

what is (for it already is), but from what in all respects is not. But it is not possible to come simply from what is not; for we said that ‘from non-being *properly*’ meant *qua* non-being, but the *per se* was said to be what becomes part of the substrate. So it is impossible for being *simpliciter* to come to be. But what *is something* comes from what is not *something*, not insofar as that is non-being – for the non-being does not survive <as part of> the being – but only *qua per accidens* <not being>.

But you will question whether the idea that animal comes from animal, ‘e.g. if a dog were to come from a horse,’<sup>261</sup> or wasps, or bees from a bull, is well expressed. For these do not develop from things that are *animals*, but as it were from some other *material* – the animal decaying, and its matter dissolving and taking on another form of an animal in this way. Hence in all these cases it is not as if animal develops from *animal*, but <rather> animal from *not-animal*. So in these cases it is a pointless exercise saying that it did not develop *qua animal* (for that pre-existed), but *qua* some *particular animal*, say a horse. For it is also true that it also developed *qua* animal from these <sc. from not-animal; from materials other than animals>; for it did not develop *from* animal.<sup>262</sup> But if someone were to say that at some stage an animal develops, what more will you say in that case than in the case of whatever other material? For each thing is capable of having become the matter of an animal at some stage.

So if we need to use some more familiar examples for the things under discussion here, let’s use the flying things that come from maggots and caterpillars. For having previously been caterpillars and maggots they change from form to form without having decayed. Here there is development from animal to animal. Another animal develops despite the other staying there. And it is clear here that the development is not *qua* animal: it was an animal without having diverged at all from the essence of animal; for it took the same definition of animal both when it was a caterpillar or maggot and after that when it became a winged thing. So it was not that animal came from animal, nor *qua* animal, but a specific animal from a specific animal. But when I say specific, I’m referring to the species: e.g. from this species of animal that species of animal. But if it had developed *qua* animal, it would have developed from not-animal (for it does not exist before coming into being); for instance, like the maggots developing from eggs. Those develop *qua* animals, but not from animals.

**191b26** And furthermore we are not undermining the idea that everything either is or is not.

Given that Aristotle has said ‘it develops neither from what is nor from what is not,’<sup>263</sup> but this seems to undermine the law of contradiction, he says ‘we are not undermining’ this. For we are saying *both*

- from what is *and* from what is not, and we *do not* fall into contradiction. For it is not in respect of the same thing that we say either ‘from what is and from what is not’, nor ‘neither from what is nor from what is not’: (a) ‘from what is’, since there is something else from which it develops, but (b) ‘from what is not’, because it is not that which it becomes. To put it in a nutshell, as a result of the privation, it neither comes from being *qua* being (because the privation co-exists with the matter, and in this respect it is from non-being – for privation is *per se* non-being); nor from non-being *qua* non-being (because the privation is not permanently resident in the matter, but makes way when the form approaches).

**191b27** So this is one way. Another is that it is possible to say the same things in respect of potentiality and actuality.

- Having examined the difficulties that are brought, about coming to be, on the basis of the *per accidens* and the *per se*, now Aristotle examines them on the basis of the potential and the actual as well. For we say that the developing things come from what is: from what potentially is but actually is not – matter is that kind of thing, so that if we speak of coming from what is, we are not saying that the developed thing is before it develops. For we are not saying that what actually is comes from what actually is, but from what potentially is but actually is not. Thus even if we say ‘from what is not’, we are not saying from what in no way and no sense is, but from what actually is not, but potentially is. Hence (a) we do not undermine coming to be, by these things, and (b) we resolve the difficulties by which coming to be seemed to be undermined.

**191b29** But this is set out in precise terms elsewhere.

- 25 In Book *Theta* of the *Metaphysics*. For the entirety of that book is spent on this, on saying what exactly ‘in potentiality’ and ‘in actuality’ are.

- 182,1 **191b30** So that (as we said) the difficulties, by which they were forced to eliminate some of the aforementioned things, are resolved.

‘The aforementioned things’: physical objects. ‘Eliminate some’: those subject to development and decay.

**191b34** This nature, had it been perceived, would have resolved the entirety of their difficulty.

‘This nature’: that of the *per se* and the *per accidens*, and of the potential and the actual, which has been expounded. For if they had

been aware of this distinction in objects, they would have resolved the difficulties on account of which they eliminated coming into being.<sup>264</sup> 5

**<Section 11, 191b35-192a25: review of earlier work relating to the notion of matter, particularly in Plato>**  
**<11.1 Exposition and discussion 191b35-192a25>**

**191b35** Some others engaged with it, but not adequately ...

Aristotle has given his analysis of matter and has shown that it is only by this means that the ancients' difficulties concerning the development of physical objects can be resolved. Now he wants to show that none of his predecessors has given an articulated analysis of matter in this way. So he says that some of those who came before us, while they did also touch on this matter, of which we have just given an analysis, yet 'not adequately'. For all those who suggested that the element was one said it was already formatted, either one of the four elements or something else intermediate between them. But they did not fully come to the notion of matter. 10 15

Plato, on the other hand, did come to the notion concerning matter. For if Plato says that matter is the nurse and receptacle of the forms, then he is saying that it is other than all the forms. And plainly he does say just that.<sup>265</sup> 'For it receives all,' he says, 'and in no sense and in no way has it ever been assigned a shape identical to any of those that enter it.'<sup>266</sup> So he touched on the nature of matter – that it is formless and is substrate for everything, but he did *not adequately* give the analysis of it. For he did not distinguish it from the privation as we do. For we say that even if the same thing serves as the substrate and as the privation, still they are conceptually distinct. And we have made this distinction both on the basis of our linguistic usage, and in that the matter survives the onset of the form, whereas the privation does not survive. 20 25

But even if Plato himself also appears to say that there are three principles, the great, the small, and in addition the one, which is what he called the form,<sup>267</sup> still he assigned both the great and the small to matter (for he predicates two names of one object: he calls matter great and small). So he did not apply the triad of principles in the same way as we do. For we say that the matter and the privation are conceptually different even if we say that they are the same thing as regards the substrate. But Plato said that the great and the small are the same not just as regards the substrate, but also conceptually, and that the difference is only nominal (as in the case of objects that have several names). 183,1 5

But suppose someone were to say that for Plato 'great' and 'small' did not mean the same, but are predicated of different things, still

that will not show that he applies one to the matter and the other to the privation. But suppose we concede that 'great' meant one thing and 'small' meant another thing, to Plato, even so they would refer to two materials, so the privation is still not distinguished from the matter, none the less.

So while it is silly to imagine that Plato did not think there was any such thing as the privation at all – at any rate, he is the one who says that there is something that is not, which falls not far short of what is,<sup>268</sup> and even if he says that matter has no form, still he knew that it had the privation of forms inherent in it – so he was not unaware that there is such a thing as privation. And what is more, Plato himself says that all things have *being* in respect of the form, but *come to be* in virtue of taking on <the form>, and *decay* in virtue of discarding <it>. So the thing discarding the form has the privation of the form.

So, therefore, if privation exists but Plato said nothing about it, that is either due to thinking it was the same as the form or that it was the same as the matter. But he would not have thought it was the same as the form (for then contraries would co-exist). So it is plausible that he thought it was the same as the matter. But if it is the same as matter, either it is the same both in substrate and conceptually, or it is conceptually distinct and the same only in substrate. But if he took it to be conceptually distinct, as we do too, he ought to mark this off and draw the distinction. And if he does not appear to do that, evidently it is clear that he took it to be the same as the privation both in substrate and conceptually.

That is what Aristotle says.<sup>269</sup>

But as for Plato: while, on the one hand, plainly it is not possible to find him saying explicitly that he did not take the matter to be the same thing as the privation; yet on the other hand, it is plain from what has been said that he knew that the privation was different from the matter. For if he says that the matter is the mother and nurse and receptacle of the forms, and does not have the form of any of the things that enter into it, it is clear that it has the privation of the forms. So whenever it receives the forms, surely it could not also at the same time receive the privation of the forms it is receiving. For then it will transpire that the same thing both is and is not at the same time. So in receiving the forms it discards the privations of those <forms>. But if that is so, they would be something different from the privation. And if he says that all things have being in virtue of the form, but becoming in virtue of taking on the form and decay in virtue of discarding it, and the thing that discards the form is the matter, and the discarding of the form is nothing else but the privation of form, then before it discarded the form the privation had been removed from it. So he thought the matter was different from the privation.

But it is no surprise if Plato does not explicitly say, in so many words, that the privation is conceptually distinct from the matter, as Aristotle does. For Aristotle himself is the one who says that we would not have been in a position to have such articulated knowledge about objects, if we had not obtained the principles and seeds of the enquiry from the ancient thinkers. And it is no surprise that we ourselves extend and add precision to the work received from those others who gave us the starting points of our knowledge of things. 10

### <11.2 Textual analysis and exegesis 191b35-192a25>

**191b36** For in the first place they agree that a thing simply comes from what is not, and that Parmenides was right in this. 15

Aristotle shows that they touched on the analysis of matter but not adequately, first on the basis of the fact that Parmenides' arguments were accepted. For if they agreed that 'being' meant one thing, and that thing was uncreated, but they also said that some things do develop, there was every necessity that they must develop from not-being *simpliciter*. For being (in whatsoever way) is one and uncreated. And again, if they agreed that what is apart from being is not being,<sup>270</sup> but being is uncreated, then they said that what develops does so from not-being *simpliciter*. Hence because they said that what develops comes from not-being, and since they called not-being 'the matter' (for it was a shared belief among the natural philosophers that nothing would come from absolute and utter not-being), thus they arrived at the notion of the matter that is not of the same sort as the things that develop; but because they applied the term 'matter' to not-being *simpliciter* they had not got a correct notion of matter: for it is not *simpliciter* not-being, but somehow-not-being (*per accidens* not-being in fact, due to having the privation), and it is not-being-in-actuality but being-in-potentiality. But they said that not-being *simpliciter* was matter. In this they were in agreement with the premises of Parmenides (the one that says that being means one thing, and the one that says that what is apart from being is not being). For if Parmenides said that being is one, and if any and every thing apart from this would be not-being – not not-being-something but not-being *simpliciter* – then it is entirely necessary, given that nothing comes from being (because being is not subject to change) that someone who accepts this doctrine to the effect that being is one and uncreated, but says that there is development, must say that it comes from what is contrary to it, and this is not-being *simpliciter*, even if he would not say that in so many words. 20 25 185,1

So Plato, by saying that it is not-being *simpliciter* from which the developing things come, does not preserve the nature of matter, which in some way is and in some way is not (i.e. it is potentially but 5



- 10 not actually, and it is being *per se*, but not-being *per accidens*, because of having the privation, which is *per se* not being).

But about these things enough has been said, in the earlier treatment, to the effect that Plato called being ‘the intelligible’ and that he did not introduce absolute and utter not-being, but not-being in respect of otherness.<sup>271</sup>

- 15 **192a1** And then it seems to them that if it is numerically one, then in potentiality it is also only one.

For they do not appear to distinguish these in the way that Aristotle does. And besides, if they said that the developing things come from not-being *simpliciter*, meaning that they come from matter, in the way we have described, it is clear that this is due to taking the matter to be  
20 one with the privation, since this privation is not-being *simpliciter*.

**192a2** But this makes a massive difference ...

Saying that some thing is one both conceptually and numerically differs not just trivially from saying that they are numerically the same but conceptually two because of the privation. The difference is huge. How great the difference is he goes on to say:

- 25 **192a6** And the first, matter, well nigh substance in a way; but privation no way.<sup>272</sup>

He says matter is ‘well nigh substance’ both because it *becomes part of substance* and because just as substance is the substrate for the remaining categories, so matter *is the substrate for substances*. As a result, matter is ‘substance in a way’, but the privation ‘no way’, because it shuns the forms and concedes its place to them.

- 186,1 **192a6** But for others the great and the small are both alike not-being (whether what is both at the same time, or what is one or the other separately).

- 5 Whereas we separate the privation from the matter in this way Aristotle says, those thinkers say that ‘the great and the small’ is matter. Either both those terms have one and the same reference for them, or they refer to different things. Either way ‘the great’ and ‘the small’ refer to matter. So we posit three principles in one way, and they in another way, he says. For we say that matter, form, privation are three items. They, on the other hand, say that there are three words, but two items. For the great and the small refer to the matter for them, whether the matter is, for them, one thing or two things.

**192a10** For they did make progress up to this point, that there must be some underlying nature. 10

Their analysis did progress well for them, as far as to posit a certain nature underlying the forms, but the next bit not so well, Aristotle is saying. For they did not say that this nature was one thing just numerically, but also conceptually – not conceptually two as we say. And in what follows he rehearses the proofs that the privation is different from the matter. 15

**192a13** For the one that remains is the auxiliary cause of the shape of the developing things, like a mother.

‘Auxiliary cause’ (*sunaitia*) is a well-chosen piece of Platonic terminology.<sup>273</sup> For what is properly the cause must be a separate thing from the outcome, like the efficient cause and the paradigmatic cause, whereas the matter is an auxiliary cause, in that it contributes to the development and becomes part of the object. And ‘mother’ because just as a mother receives the seed and looks after it and brings it to perfection, so too the matter receives the forms and looks after them and brings them to perfection from her own resources, constantly creating, with sustenance from herself, a base for full-term arrival for the form. 20

**192a14** But the other half of the contrariety would frequently appear not to exist at all to one who focuses his mind on its maleficent aspect. 25

Aristotle has added this as a kind of defence on behalf of Plato. He is giving the reason for why Plato did not distinguish matter from privation. For if someone looked at the maleficent side of the privation, says Aristotle, he would think it did not exist at all. And how could someone distinguish that which he thinks does not exist from that which does exist? Discrimination and differentiation is necessary among things that exist, not among non-existent things. 187,1

He says that the privation is ‘maleficent’ because it is the cause of destruction, as the form is cause of coming-to-be and of being, and for each thing its well-being and its good are in respect of its being. So since the good is the common source of all things, it is clear that everything that exists is good. For nothing that does not partake of the good can exist. So being is good for each thing, since being is derived from the first source, and that is the good. But if being is good, then not-being is bad. And if not-being is bad, then the cause of not-being would be maleficent. And so, since what does not partake of the good cannot even exist, then the privation, which is maleficent would also not exist at all, if being is also invariably good. So for this 5 10

reason, says Aristotle, the privation will also seem not to exist at all; but then again it is necessary that it too does exist, since without it there is no coming-to-be. In fact, as Themistius says, 'it is astonishing if it exists, given that it is destructive of being, but it is astonishing if it does not exist, given that it is creative of coming to be; for nothing would come into being if something were not destroyed, but all things would be eternal.'<sup>274</sup>

**192a16** For, given that there is something divine and good and sought after ...

By these words Aristotle is giving a justification for how the privation is 'maleficent'. 'For, given that there is something divine ...', he says, but he means *the enmattered form*. For it is not the case (as one might suppose) that it is about the first 'divine and good and sought after' that he says <this>. For he says that there is something *opposed* to this one, whereas nothing is opposed to the first one. So he is saying that the enmattered form is *divine*, but divine *in so far as it comes forth from god*. And 'good' because for each thing its being is good. Now we do say, on the one hand, that privation is opposed to form, because privation is the cause of not-being, but if it is to *the good* that the privation is opposed, then the privation is bad. On the other hand *matter* is not opposed to form; for it seeks form, says Aristotle, as ugly seeks for beautiful and female for male. For just in so far as it shares in ugliness – meaning privation – to that extent it seeks the beautiful. For it is put into good order by beauty. So if matter seeks form then those who think that privation and matter are one thing are saying that privation seeks form, if matter and form are the same thing. So the contrary seeks its contrary. But what seeks for its contrary seeks its own destruction. 'For contraries are destructive of each other.'<sup>275</sup> So something seeks its own destruction – which is impossible: nothing seeks its own destruction. And further if the form is sought after because it is also the cause of <the thing's> being, and <its> being is good, it is entirely necessary that a thing is either seeking *itself* or its own *contrary* (by which I mean the privation or the matter). But neither does it seek itself (for it has no lack of itself, but a thing seeks what is absent and what it does not have) nor does the privation (for it would seek its own destruction).<sup>276</sup> So the remaining option is that the *matter* seeks the form. But if the matter seeks the form, but matter were *the same thing as privation*, then it would seek its own destruction.

And besides, if matter were the same as privation, how could we hang on to the idea that it partakes of some form? For if the matter of human being were the same thing as the human privation<sup>277</sup> – and in general if some matter were the same as some privation – then

when the *privation* of human being was destroyed at the origin of a human being, the *matter* of the human being would be destroyed as well. But how could what has been destroyed take on the form? So the form of human being is not in matter.<sup>278</sup>

And if some particular matter were the same as some particular privation, then matter generally would be the same as privation generally. And conversely, if matter generally were the same as a particular privation, then a particular matter would be the same as a particular privation. So if matter in general is the same as privation in general, it is clear that even if it partook of some form, but not of some other one, it would be destroyed and would no longer be indestructible. So that if the privation is the same as the matter, it would not be indestructible, nor will the forms have their being in matter because of the latter being destructible. For just as the privation yields to the form, so too will the matter, it being the same thing as the privation. 15 20

So the form is 'divine', in so far as it comes forth from god and 'good' since for each thing its being is good, and sought after in itself. For the good is also invariably something sought after.<sup>279</sup>

<192a20 But in fact it is not possible for the form to seek after itself because it is not lacking, nor the contrary (for contraries are destructive of each other), but rather this is the matter.>

But how come Aristotle says that the form 'is not lacking' but that the lack belongs to the matter? It is not that it has no need of the matter for its being, but that the matter, being ugly and undefined, is in need of the defining and formatting <form>, whereas the form, being itself beauty and definition, is in no need of anything for that. For what is lacking must first be there, and then be either lacking or not lacking. So the matter, even if it has no need of the form for its existence, at least as far as its own specification (*logos*) is at issue,<sup>280</sup> still it is a thing that is lacking, and it is in need of being defined and arranged; whereas the form is, and has no need of anything that will lead it into order and definition. 25 30

<192a23 Except the matter is not ugly *per se*, but *per accidens*, nor female, but *per accidens*.> 189,1

Aristotle says the matter is not ugly *per se*, but *per accidens*. For ugliness is the privation, and matter is ugly due to sharing in the privation. But it is ugly *per accidens*. For it is not in its own specification (for the privation is ugly in its own specification). Rather it is that it accidentally happens to be in a state of being deprived of the forms. And if it is such as by nature to take on the forms, it could not be ugly *per se*. For it would never admit the 5

contrary. And in the same way ‘female *per accidens*’, since the female is passive and the male is active and form-giving. But matter is passive, and the form acts upon it.

**<Section 12, 192a25-b4: that matter is uncreated  
and imperishable>**

**<12.1 Exposition and discussion: 192a25-b4>**

**192a25** In one way it perishes and comes into being; in another way not.

- 10 From this point on Aristotle shows that matter is both uncreated and imperishable – uncreated not causally but temporally: this is clear both (i) from the arguments on the basis of which he shows that it is uncreated and imperishable, and it is also clear (ii) from things he says elsewhere: for in speaking of the first <being> he says ‘thence comes being and life for all things, clearer in some, weaker in others’,<sup>281</sup> so <this means> for matter too. And again he says ‘So upon such a source both the universe and the world depend’,<sup>282</sup> so <this means> the substrate of the world as well –<sup>283</sup>
- 15

- (i) From the arguments themselves, namely that temporal becoming eliminates matter. For what does Aristotle say? That if it were not uncreated but came into being ‘some substrate must be there first’<sup>284</sup> out of which it comes *per se*, and not *per accidens*. And having
- 20 shown that this hypothesis leads to an absurd consequence, he eliminates this option, and brings on the contrary.

- But it is clear that if he says that were matter created, some substrate must underlie it before, he is suggesting temporally created, particularly if something must necessarily *pre-underlie* it. But he eliminates this hypothesis; so he eliminates the idea that matter is temporally created, not the <idea that it is> causally <created>.
- 25 But the opposite of what is temporally created is the temporally uncreated. So he wants matter to be *temporally* uncreated, not causally.

- So it is both uncreated and imperishable, he says; but it could be said to perish or come into being *per accidens*. For since the privation which is in the matter *per se* perishes on the arrival of the form, the matter too could be said to *perish per accidens*. For if the matter is formless, and this formless thing is in a state of privation of the forms, then since what is formless in the matter perishes when the forms arrive (because it is formatted), for this reason, it too is said to
- 190,1
- 5 *per accidens* perish. For it is not its *being as such*, and not its nature and substance – so to speak –, but only its *formlessness* that perishes. As in the case of the wax which is in itself shapeless, when it is shaped its shapelessness perishes, and in this sense the wax would be said to perish *per accidens*, yet the substance of the wax does not

itself perish, so also one can say the same in the case of matter: because the privation that is in the matter *per se* perishes, the matter too could be said to perish *per accidens*, and to come into being again whenever it discards the form and takes up the privation. For in virtue of the privation coming to be in it, it too is said to come to be, *per accidens*, because it is also formless in its own specification; as though one were to say that the jug perished as the wine in it came to an end, or that the white horse perished when its whiteness went, and came into being when it returned.

It is in this way that matter would be said to perish and come into being not *per se* but *per accidens*. But *per se* it is uncreated and imperishable, Aristotle is saying. And in order to show this he gives the definition of matter on the basis of which he is showing that it cannot come into being or perish. 'For by matter,' he says, 'I mean that which first underlies each thing, out of which, as a constituent, something comes, not *per accidens*.' 'First' is put in because of three dimensional extension: this too underlies all other things, but not *first*; and different things are more particular substrates, but not first substrates, for different things; whereas matter is first substrate for all. 'Out of which as a constituent' because things that come to be also come *out of* the privation, but not <with the privation> *as a constituent*, but *per accidens*; whereas *per se* <they come> out of the matter. For that is a constituent. And from this you get what it is out of which things that come into being come *per se*.

So having obtained the definition of matter in this way, Aristotle spends a while showing that it is uncreated as follows: (i) If it does develop, it will do so out of some substrate (for nothing develops out of absolute and utter non-being), but this is the nature of matter, which is first substrate. So there will be matter before matter develops. (ii) Again, if it decays, it will decay into something, but what decaying things ultimately decay into is matter. 'So that it will be already decayed before it decays.'<sup>285</sup> For if what this item decays into is matter, but it was matter before it decayed, then before it decayed it will be decayed and after the decay it will be there again. And again, concerning the matter out of which it develops and into which it decays, one must ask if that would be uncreated and imperishable or not. For if that too developed and decayed, then clearly something else must pre-underlie that, and either it will have to go on ad infinitum like this, which is absurd, or it will have to stop at something uncreated and indestructible. Well, that will be the prime matter. And why did we say this in the case of the prime matter? Because our discussion is about prime matter.

In this way matter is shown to be uncreated and imperishable, given this axiom, that nothing develops from absolute and utter non-being. But suppose someone did not go along with the axiom? For

even according to Aristotle himself it is not from existing outside of the mixtures that the forms supervene upon the mixtures. For it is not the case that the mixture of the elements *makes* the irrational soul, or animals as a whole, when it does not do that in the other forms either (I mean the form of flesh and that of bone and things like that). Rather they supervene on the mixtures from outside of the entire creation,<sup>286</sup> not having existed before. It is clear, therefore, that there is indeed *supervening* out of absolute and utter non-being, meaning not as out of the material cause. For it is not that some pre-underlying material cause, changed thus and so, made the irrational soul. Rather the appropriate mixture merely makes the body ready to receive it. The mixture is not the soul, however.

- 20 For just as the person who sets up the strings of the lyre makes them ready to receive the form of the tuning, and the strings are not themselves tunings, but the tunings are added to the strings from without by the technician, so it is also in the case of the mixture of animals' bodies. For the lives are added from without to the suitability of the mixture, by the creation. For worse would not be cause of  
 25 better and soulless of soul and lifeless of life. So if such things are not eternal but come and go, and they do not get their reality, and their existence so as to be, out of some pre-underlying matter, how can one accept the principle that nothing develops from absolute and utter non-being, but <always> as from a pre-underlying material cause? And these are things that I affirm in respect of the *first subsistence*  
 30 of matter, that nothing prevents it from subsisting from absolute and utter non-being, if *even now* all the forms have their own being not from anything pre-underlying. For the *composite* is what develops from the matter.

Still, in the case of particular developing things now, it is plain that the matter of each does not come into being or pass away.

- 192,1 With respect to the present discussion, this is as far as we go, although there are further arguments on the topic.<sup>287</sup>

- But someone might plausibly ask in these cases how the definition of matter is delivered. For if it is not possible to grasp the essence of matter directly, and for this reason we get our knowledge of it by  
 5 analogy or apophatically, how does Aristotle now deliver a definition of matter? For definitions are assertive (*cataphatic*), but it is not possible to assert anything of matter.

- Well our view is that the definition here delivered for matter is not descriptive of its *essence* – it does not purport to assert anything of *it* – but rather of its relation *to the forms*. And in the same way as the definitions of genera do not purport to assert anything  
 10 else of them, but merely state the relation that they have to their subordinate classes (when I say 'genus is that which is predicated of more than one thing differing in species, in the category of "what



it is”, I have not said what the essence of the genus is, but what relation it has to the subordinate classes, and this is not strictly definition, but more description), so too it is our view that, in the case of matter, what is produced here is not a definition but more a description, indicating what kind of relation it has with material objects. 15

### <12.2 Textual analysis and exegesis: 192a25-b4>

**192a28** But as potential, not *per se* ...

That is, <understood> according to its own potential, it is *per se* imperishable. For it is always all things in potentiality; while it does not always have the *privation*, yet it always has its <capacity for> *being everything in potentiality*. And ‘this is its nature’.<sup>288</sup> 20

**192a34** But concerning the formal principle, whether it is one or many, and what it (or they) is (or are), that is a task for first philosophy to define with precision.

‘Concerning the formal principle’ Aristotle says, but he is referring to the separate form that is the source of being for the forms down here, not to the forms *in the many*. For it is the physicist’s task to deal with the latter. But ‘it is a task for first philosophy to define’ whether this is one or more than one, and, if one, what exactly it is, and if more than one, what they are and how many; so he refers discussion of this matter to those <books>. In Book *Lambda* of the *Metaphysics*, he discusses these matters: whether this is one or many, and, if many, how many these things are, and how the many relate to the one, in that it is thence that all things depend. ‘For a proliferation of rulers is not a good thing’, he says.<sup>289</sup> So Aristotle too, in accordance with Plato, knew the forms that are separated and transcendent and causes of the ones down here, and it was not in vain that we said earlier that when he used the phrase ‘the principles need to last for ever’ he was referring to these forms.<sup>290</sup> 25  
30  
193,1

But in the next book, and in all the other physical treatises, he will discuss natural form, which is created and perishable, (for instance the forms of animals or of atmospherical phenomena and other things that are purely natural). 5

**192b3** That there are principles then ...

We showed at the beginning of this work that if natural objects are composite, and in composite things the simples are principles, then natural objects have principles.<sup>291</sup>

- 10      **192b3** ... and what they are and how many in number,  
– that <they are> matter and form and privation and that the principles enumerated are in one way three, and in another way the ones that are properly *per se* principles are two: matter and form. For privation is not a *per se* principle, but *per accidens*.

## Notes

1. The translation sounds awkward here, but is deliberate in order to preserve the sense for Philoponus' comments on the propositional phrase to be understood with 'say'.

2. That is, the Presocratic philosophers who do have a contribution to make to natural philosophy (as opposed to the Eleatics, including Melissus and Parmenides, who had been shown in Chapters 2 to 3 to be not engaged in natural philosophy at all). The natural philosophers here include Presocratics such as Thales, Anaximander, Anaximenes, Heraclitus, Empedocles, and Anaxagoras. For more information on the lives and doctrines of these early thinkers see G.S. Kirk, J.E. Raven and M. Schofield, *The Presocratic Philosophers* (2nd edn; Cambridge: Cambridge University Press).

3. See above, 23,3 (in Catherine Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 43, and note ad loc.).

4. See above, 23,14-15 (in Catherine Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 43, and notes ad loc.).

5. This view, which appears to match what we generally attribute to Anaximenes rather than to Thales, is attributed to Thales not just here but also at 116,20 and at 123,15, which suggests that it is not a mere slip of the pen.

6. Aristotle's words from 187a29 concerning Anaxagoras. The parenthesis is anacoluthic as a result of Philoponus borrowing Aristotle's words to complete his sentence, since what he means is that they too made becoming such and such into a case of alteration.

7. Or 'homoimeries'. See above, 24,24-25,4 (in Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 44-5 and notes ad loc.).

8. Philoponus seems to understand Anaxagoras to be giving a particulate structure to matter, such that there will be small particles, like barley seeds, in the mixture. This atomist style of thinking makes it rather difficult to see why pure particles are never extracted; Philoponus implies that this is simply because Intellect never gets the task completed. For reasons in favour of thinking of Anaxagoras' matter as not particulate but smooth and thoroughly blended, see Jonathan Barnes, *The Presocratic Philosophers* (2nd edn; London: Routledge and Kegan Paul, 1982), 323-6, and Richard McKirahan, *Philosophy Before Socrates* (Indianapolis: Hackett, 1994), ch. 13.

9. Empedocles fr. 6 DK.

10. 'Sphere'. The normal Greek word for sphere (*sphaira*) is feminine. Empedocles' masculine equivalent appears to be peculiar to him. See fr. 27 and 28 DK.

11. The details of the development of the plural world from the sphere are not obviously supplied in the principal fragments of Empedocles, but see fr. 31 DK and the material in the Strasbourg papyrus (which may have some bearing on this, especially ensemble a (i) 8 to a (ii) 7, if it is reconstructed as describing a period of

increasing strife). See Alain Martin and Oliver Primavesi, *L'Empédocle de Strasbourg: Introduction, Édition et Commentaire* (Berlin: Walter de Gruyter, 1999) and Richard Janko, 'Empedocles, *On Nature* I 233-364: A New Reconstruction of *P. Strasb. Gr. Inv.* 1665-6', *Zeitschrift für Papyrologie und Epigraphik* 150 (2004), 1-26.

12. Or 'indefinite' (*apeiron*).

13. The point seems to be that the indefinite could be either a substrate (which then continues as the substrate of the things the develop out of it) or it can be an infinite container, in which the other things are already present only to be extracted and made manifest (like a box of tricks). If it is the latter then it is not really one source, because in fact it already contained an actual plurality of things waiting to be extracted, unless one can speak of the container as the one element from which the things in it derive; this is the point of the house example in Philoponus' account here. This suggestion is presumably supposed to be implausible.

14. The sentence appears to be ambiguous as to whether Aristotle or Anaximander is the subject of *legōn*. The translation given takes it as Anaximander. The alternative is that Aristotle is the subject of *ekpipte* and that the sentence is helping the reader to identify what is the implicit (but not explicit) target of Aristotle's remarks. The explicit target has, apparently, been Anaximander. But (says Philoponus) Anaximander can hardly have meant that the things developed from the infinite by extraction from a container, because that would make his principle not one thing but a container of many things. So it transpires that Aristotle is really targeting Anaxagoras who does start with a primary plurality from which the things are extracted and in which they already actually existed. But see 87,7-10 and 93,15-19 for evidence that Philoponus does believe that Anaximander was committed to separation out of things subsisting in the one.

15. cf. 51,24 above (in Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 72).

16. A word or words are taken *kata koinou* where they are placed in such a way that it is not only ambiguous whether they are to be read with what follows or what precedes, but where both senses are acceptable (or indeed intended). See Aristotle's comments on this kind of ambiguity in Heraclitus fr. 1, at *Rhetoric* 1407b11, and another example below at 140,6.

17. This point seems to recapitulate the material in the earlier part of this commentary which dealt at length with the idea that the Eleatics were not natural philosophers (and hence not relevant to the present survey of earlier opinions on natural philosophy). See Philoponus in *Phys.* 21,30-33,3. On the mention of theology see also Osborne, 'Introduction', *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 1-2.

18. 187a20. See below, 93,13-19.

19. 187a20.

20. 187a21.

21. There is no obvious material in the written works of Plato to supply this account of Plato's principles, which is mentioned again below at 191b35-192a5. Aristotle is explicit that it belongs to some unwritten teachings of Plato (*Physics* 209b14).

22. I have translated this sentence on the basis that it is supposed to provide an explanatory principle that lies behind the preceding claim about the larger volume occupied by air, relative to earth of the same weight. Alternatively (if the explanatory force is the reverse) translate 'This is also why a heavy body changing to a light one acquires a rarefied volume etc.'

23. The thought experiment is a little obscure, but the point seems to be that

air, being less dense than earth, occupies more space for the same weight, and that in general a process of becoming lighter involves spreading the same quantity of stuff over a larger volume of substrate so that the weight per volume is lower. Then we imagine the same weight of air and earth, and we find that air is to be regarded as excess because the volume of air is greater than the volume of earth. The reason for imagining the bodies in motion at equal speeds in contrary directions is not immediately clear (but perhaps the thought is this: the substrate here is taken to be mere extension without weight, so the weight comes from the body occupying it; so when air moves up it displaces earth from the space it is going to occupy. But being less dense than earth it takes up more space than the same quantity of earth, or it displaces a larger weight of earth, because it is more thinly spread through the substrate.) Philoponus seems to think of matter becoming air from having been earth just in virtue of being the same stuff more thinly spread. The same kind of thought is expressed in the next idea, that white is just black more thinly spread.

24. See Theophrastus *De Sensibus* 86.

25. Here Philoponus seems to toy with one explanation of how white could be seen as excess and black as deficiency (namely the relative density of colour) and then reject that in favour of an account based on the idea that what is reflective is excessive and what it absorbent is deficient. The basis for this claim is not explained, but is perhaps the idea that what is reflective deflects light because it is already full while what is absorbent is in some way needy.

26. Probably Philoponus is referring to the discussion of whether the principles are two or three in Chapter 6 (as Vitelli suggests). See below, 127,20-142,21.

27. I take the verb *kalousin* to imply that they use this terminology for matter, or at least that they use this terminology for something. Otherwise it is hard to see what this sentence is supposed to be saying.

28. On the relation between this and the earlier clause, see above, 90,20.

29. See the earlier discussion at 90,22.

30. Compare 87,1-4; 88,24-30.

31. Homoimeries.

32. Sphere, masculine. See above, n. 10.

33. See above 88,4-23 and n. 11. For the idea that the elements are currently mixed, see e.g. fr. 21 and 23 DK.

34. See fr. 1 DK.

35. *arkhai*. This term does not appear in the extant fragments as vocabulary used by Empedocles in this sense.

36. *rhizômata*, see fr. 6 DK.

37. *hoi te peri ton Dêmokriton* (both those of the school of Democritus) seems to invite an answering *kai hoi peri* ... (and also those of the school of ...) but in fact we get *kai Empedoklea* (and of Empedocles), so that the *te* (both) is either redundant or wrongly placed. The sentence appears to begin with one intended syntax and change to another part way through, but may well be how Philoponus wrote it.

38. Philoponus identifies five arguments attacking Anaxagoras in what follows, covering 187b7-188a18.

39. 187b7-13. See below, 101,29.

40. The *reductio* here relies on the idea that the things whose principles are unknowable (because infinite) are unknowable by any kind of knowledge (*gnôsis*), including science (*epistêmê*, which is only one kind of knowledge: this is the point of the observation that 'knowledge (*gnôsis*) has a broader extension than science (*epistêmê*)'). So if knowledge of the things is impossible, then science is impossible.

Philoponus' version looks somewhat unlike what Aristotle himself says (Aristotle confines the objection to the impossibility of knowing the aspects that are infinite or indefinite, namely the quantity and form of the thing: which would not in itself rule out science unless science is one of those kinds of knowledge). Philoponus instead tries to insist that all knowledge is impossible of something that is infinite, and hence that science, being a species of knowledge, must be undermined.

41. 187b13-21. See below, 102,11-105,5 (where this argument is sometimes called 'the first objection' perhaps because it is the first 'factual' one). For this confusion about the numbering see 99,32.

42. The idea sketched in this paragraph nicely anticipates the observations in the essay by J.B.S. Haldane, 'On Being the Right Size', in John Maynard Smith (ed.), *On Being the Right Size and Other Essays* (Oxford: Oxford University Press, 1985), 1-8, which also draws attention to the biological factors that limit the possible size of the members of a particular species and the ways in which it would need to adapt if its size increased or decreased (given that volume increases by the cube as area increases by the square).

43. The sense is not seriously in doubt here, but MS K reads *esti de kai hōs megethos* (and it is also possible to take it as magnitude). It is arguably preferable to accept this reading than to follow Vitelli in deleting the second *esti*.

44. I have followed Vitelli in deleting *legō hē tomē* in this sentence.

45. Philoponus here compares the division below the minimum size to the division of a non-homoiomerous entity, namely a human being composed of head, feet and so on, and he allows that mathematically such a division of the minimum flesh is possible (the minimum portion of flesh is a quantity and as a quantity it is divisible) but you cannot divide it and still have the parts be flesh. This appears to go against the claim that the flesh is homoiomerous, always composed of parts that are uniform with the whole. But I do not think it really does, because Philoponus wants to say that the flesh in some sense cannot be cut into parts that are components of flesh, but rather that cutting it beyond the limit would destroy the possibility of reconstruction. Hence the comment 'But the minimal flesh is also uniform, but in a quantity that preserves the entirety'. It is not that there are different parts in it: it is uniform. But there is a minimum size beyond which the 'presiding nature' cannot survive. So Philoponus seeks to preserve the truth of mathematics, such that theoretically magnitudes can always be divided, alongside the thought that physical stuffs that are uniform through and through cannot survive beyond a certain minimum size. This account, with its appeal to a 'presiding nature' (*epistatousē phusis*) that is analogous to craft in the artefact cases, seems to be an original attempt by Philoponus to resolve the mathematical difficulty.

46. That is, there are potential parts in the minimum flesh, and they are all made of flesh. But because further divisions would make it and them no longer flesh, you cannot isolate those potential parts and still have them, and have them be flesh, once the whole of which they were parts has been divided.

47. 187b25; see below, 104,30-105,5. For the first axiom see above 96,27, relating to 187b13ff. The two axioms together yield the 'second argument' against Anaxagoras.

48. That is to say, in the sequence of five objections this is the second, but it is the first one that Philoponus describes as 'factual', as opposed to the logical objections brought to bear in the first objection (187b7-13, above 96,8) which was an *ad hominem reductio*.

49. It appears that Philoponus is here referring to the successive taking of finite

quantities of the same size, which will indeed exhaust any finite body in a finite number of steps. A believer in infinite divisibility, such as Anaxagoras, will naturally respond that this is not so in the case of a Zenonian division. This objection is anticipated and countered by Philoponus in the next sentence.

50. It might seem from the foregoing argument that these two alternatives are not the same: that is, it might still be true that there is some of everything in everything, even though it might not be possible to extract it as a portion of flesh below the size at which flesh can be extracted as flesh. This seems to follow from the claim that all the potential parts of a minimum flesh are actually flesh. However, it is true that there will be a finite number of divisions that could yield the result that flesh is extracted and flesh still remains as actual flesh in the water. So after the last extraction, the water that remains will not have actual flesh in it.

51. According to the analysis below (105,26) this objection starts at 187b35, usually identified as the beginning of the fourth objection by modern editors. Philoponus has taken the whole of 187b13-34 as one objection which includes statements of two axioms at 187b13 and 187b26. His third objection now runs from 187b35 to 188a2.

52. 'Of the same sort': probably this means factual again like the second one (see above 96,26).

53. According to the analysis below the fourth objection starts at 188a2.

54. Throughout this paragraph it is ambiguous whether *apeiron* is to be taken as numerical infinity (infinitely many) or spatial (infinite magnitude). I have translated it 'infinitely many' because the argument seems to be assuming infinitely many portions of flesh, blood etc, rather than portions of infinite size. Infinite magnitude is then introduced as a result of the infinite multiplication of finite magnitudes. The final clause seems to equivocate on the two senses of infinite.

55. The fifth objection in the list, which evidently refers to the passage 188a5-13. This is not explicitly identified as the fifth objection below (106,20) but the repetition of this phraseology at that location unambiguously identifies the intended passage.

56. The word for 'unintelligent' is *anoêtos*. This can mean either 'unintelligible' or 'unintelligent', and the ambiguity, as well as the word-play with 'intellect', is doubtless intended. Aristotle's own term is *atopos* meaning 'absurd', but Philoponus' conclusion at line 10 suggests that when he substitutes *anoêtos* for Aristotle's *atopos* he means us to read it as 'unintelligent' (though it would also make sense to understand that sentence as meaning 'then his intellect would be unintelligible in attempting the impossible').

57. See previous note.

58. *sumbebêkota*.

59. *hexeis*.

60. The same ambiguity of *anoêtos* occurs here (see above, n. 56), so that this sentence might read 'So the intellect is unintelligible in seeking unintelligible things'.

61. The distinction between animate and inanimate does not quite capture the dichotomy *empusukha* and *apsukha* used here, which means things with and things without a soul. Aristotle uses 'soul' (*psukhê*) for the life force animating all living things, including plants which have minimal life processes for growth and nourishment. It is not clear here whether Philoponus means the rotting bodies to include both plant and animal bodies or both organic and inorganic materials. For



the idea of spontaneous generation of insects from rotting bodies, see below, 107,14, 115,29, 179,9 (and notes).

62. 'The same house' presumably means a house of the same size and shape.

63. The term *thrix*, here translated 'vein', normally means 'hair'; but the structure of the Greek sentence suggests that the reference is to another detail of the anatomy of the eye, alongside the membranes (*khitônes*), to which the term 'colours' would apply. The hair-like veins in the white of the eye may be intended.

64. Philoponus envisages two potential arguments in defence of Anaxagoras (102,23 and 103,12) against Aristotle's argument which was that if there is a limit to the size of a whole creature then there is a limit to the size of the parts of which it is made. The proposed defence is first that you cannot infer from the limit on the whole that the parts are so limited, since one could make a creature of the same size out of smaller component parts (102,24-103,5) to which Philoponus responds (103,5-12) that there is a definite number of parts out of which the whole human being is made. Then he envisages a further attempt to rescue Anaxagoras (103,12-20) on the grounds that it is possible that the uniform parts such as bone might go on decreasing in size, but the form of human being would not be able to occupy such small size, so there would be a limit to the smallness of the complex form, though not to the simple forms. Philoponus replies to this supposed defence (103,20-33) by pointing out that it is not available to Anaxagoras, since it speaks of supervening forms. Supervening forms are something to which 'we' subscribe (103,22) but not Anaxagoras. 'So the reasoning would necessarily be correct as far as Anaxagoras' theses are concerned': i.e. the reasoning expressed in the initial claim made by Aristotle (187b13) that if there is a limit on the size of the whole creature then there is a limit on the size of the components (see 102,13-24).

65. This paragraph adds another argument to show that the idea of *ad infinitum* division of the parts is absurd. Whatever parts you identify for a thing, they could equally be seen as composed of smaller components. Hence a smaller animal can be seen as composed out of more parts and a larger one can be seen as composed out of fewer parts.

66. *enuparkhon*: this is one word, not a phrase, in Greek.

67. 187b13.

68. *analysis*: breaking down into its simpler constituents.

69. *anomoio meres*: having non-identical parts.

70. *kath' hupokeimenou*.

71. Here the variant reading *pollakhou* in place of *pollakhôs* would translate 'but he often uses this phrase'.

72. See above, 101,17.

73. Aristotle regularly refers in passing to the idea that some insects are produced by spontaneous generation from rotting matter, a belief that he does not challenge or reject despite his observations of the insects in question. See especially GA 732b10-15 where he grants that the insects in question are also observed to produce larvae by sexual reproduction. He is actually quite well-informed on the life-cycle of insects and the relation between larva and adult (GA 758b7-759a4). Philoponus seems to endorse a rather simple-minded version. See above, n. 61 and below, 115,29; 179,6.

74. Philoponus reads *de* (but) at 188a16. This means that Philoponus has a separate sentence start in 188a16 (which is the next lemma for him). Hence Philoponus takes this sentence at 188a15 to deny a parallel between bricks to house and clay to clay. *De* (but) is bracketed in Ross's text (guessing that it was missing in the text read by Simplicius and Themistius) so as to append that phrase

to this sentence and suggest that the parallel denied here is between bricks to house on the one hand and water to air on the other.

75. The back reference is perhaps to 101,19, although Philoponus did not in fact claim that talking of development from clay was a less proper use of terminology, but rather implied that one could say either.

76. On the reading here see above, n. 74.

77. 184b25-187a10, analysed by Philoponus CAG 26,21-86,19 (translation in Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006)).

78. 187a10-b7, analysed by Philoponus CAG 86,20-96,2 (above in this volume).

79. 187b7-188a18, analysed by Philoponus CAG 96,3-108,11 (above).

80. Chapter 2, 184b15-25.

81. 184a2.

82. See above, 4,8-5,6 (in Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 25-6).

83. The passage in Aristotle is 184b25-187a10. The first move noted here is identifiable at 185a3. I am not sure where the second move is supposed to occur if it is supposed to be part of the refutation of Parmenides, but it may rather be a reference to 187a10-b7.

84. 28,8-16.

85. I have not been able to identify precisely what passage of Aristotle is being summarised here (possibly 187a11).

86. 187b7-188a18.

87. *Towards Truth* and *Towards Opinion* translate *pros alêtheian* and *prosdoxan* which appear to be the titles used by Philoponus for the two parts of Parmenides' poem. I have continued to translate these in this way, as in the first volume of this work to capture the idea of routes of travel in the two parts of the poem.

88. In the extant texts of Parmenides the two principles named in *Towards Opinion* appear to be 'fire' and 'night'. Here and throughout the remainder of this volume, Philoponus regards the two principles as being the hot and the cold, but suggests that Parmenides called them 'fire' and 'earth'. See below, 110,17; 116,19; 125,25; 126,1; 139,9.

89. See above, 110,1-2 and note ad loc.

90. 188a27. Aristotle's text reads 'reasonably' (*eulogôs*) not 'plausibly' (*eikotôs*), but Philoponus writes *eikotôs* again at 117,23 and 24. It is slightly surprising to have what appears to be a new lemma in the middle of an extended expository section. However, this is clearly not intended to begin on the textual analysis section, since that clearly begins with 188a19, at 116,17, and the present quotation appears again as a lemma shortly thereafter.

91. 188a27.

92. 188a28.

93. Much of this passage is reminiscent of the *Phaedo*, not least Philoponus' apology for the apparently conflicting statements about whether contraries come from each other, which is loosely paralleled at *Phaedo* 103A-C. Effectively Philoponus is saying, just as Socrates said there, that in one sense contraries come from each other (i.e. after each other in a sequence of changes of quality in things) but they do not remain and submit to the compresence of the opposite quality (as they would have to if they were what a thing is made out of in the material substrate sense: this aspect is not observed in the *Phaedo*). The image of abiding and submitting to the imposition of the other form is parallel to that

explored in the *Phaedo*'s final argument (102E; 104C, etc) where *hupomenein* is the verb used as here; the language of 'opposites come from opposites' is paralleled in the Cyclical argument (71A-D etc.), although in our texts Plato never corrects his language to *met' allêla* as apparently in Philoponus' text. Cf. further below, 119,1.

94. The contrast between 'composite' and 'simple' here is not between complex and simple substances, or complex and simple forms, but rather between substance as a composite of form and matter, and each of the two aspects of the composite taken by itself (the latter being simple, as in 'the simple forms', 112,17). Forms can be opposed but substances cannot, and the reason is that the substances all have the same substrate.

95. 188b10-11.

96. *sumpatheia pros allêla*.

97. Here I have translated the text with 'if' retained. Vitelli brackets it, making the sentence assertive not hypothetical, but I do not see the need to interfere with the text. I imagine that Philoponus offers the musical illustration merely as a hypothetical analogy, not itself a case of a composite substance, although later it appears to be a case of an artificially created object; the musical illustration (which is not in Aristotle) is presumably prompted by use of the term *harmonia* and related vocabulary by Aristotle (188b12-16) for a structure of components in a substance. I have translated *harmonia* as 'harmony' (the conventional translation which best captures the idea of a proportioned whole with harmonious arrangement of its parts) although in its non-metaphorical musical application *harmonia* is sometimes more closely akin to our terms 'tuning', 'chord', 'key', 'mode' or 'scale' than 'harmony'.

98. Here Philoponus uses the technical terms for the upper and lower notes in the chord (or the top and bottom notes on the highest and lowest strings in a particular tuning), and gives typical examples of the epimoric ratios that characterise the major musical intervals. The named modes were scales with characteristic sequences of intervals, which gave music composed in that mode its typical associations and 'feel' to the audience.

99. *anarmostia* (a privation of the relevant harmony), translated 'disharmony' in the metaphorical cases, but wrong-tuning for the musical examples.

100. 188b10-11.

101. Philoponus here speaks as though the semen of the male and the menses of the female both contribute jointly the material cause of the offspring, so that a human being develops (here counterfactually) from equine seed and menses together as matter. Aristotle's official doctrine is that the offspring derives its matter from the mother (the menses) and its form from the father (imposed through the semen). See *GA* 1, 724b4-12; 729a22-33; 729a33-b22.

102. i.e. strictly speaking the privation is the item which can receive the relevant form or state but does not currently have it, while something that lacks that form but is not naturally fit to receive it is here called 'non-house' in the sense of a negation rather than a privation.

103. *poiotêtes pathêtikai*, qualities of the *pathos* type. The contrast is between formal properties of shape and structure on the one hand, and qualitative properties which have opposites.

104. 'Blackboard' here (and below at 116,3-8 and 146,22) translates *abakion*. The *abakion* was either a board for performing calculations on, or a sand tray for drawing geometrical diagrams, serving the role currently served by a blackboard or whiteboard or electronic visual aids. Philoponus uses it here as an example of a

composite wooden artifact other than a chair, and it seems likely that (as with many lecturers) he refers to an object near the lectern in his classroom.

105. The illustration offered in the next sentence helps to explain what this gloss ‘that is to say, primaries’ is intended to mean. One thing can come from another directly, without first being broken down into more basic stuffs (the maggots from the rotting horse) or it can change by way of first breaking down into some primary, ontologically more basic, stuffs (e.g. by being broken down into elements which then form something else). Presumably the gloss is necessary because the notion of ‘intermediate’ might imply some intermediate state of matter between elements and things, but in reality it is referring to the intermediate stage in a process of change, which, in this case, goes by way of a more basic stuff.

106. See above 115,29, 179,6 and n. 73.

107. See above 110,1-2 and note ad loc.

108. See note on 86,29, and cf. also 123,15.

109. Vitelli’s text, as translated here, reads *enantiôn* with the manuscripts (with a variant *enantia* in one manuscript); but the sense is not good and I suspect that the correct reading might have been *atomôn* (i.e. composed of angled atoms).

110. Vitelli closes the bracket at the end of this sentence, but it seems preferable to close it as shown here, before ‘but in another thing’. Compare the brackets above at lines 3-5, where Vitelli has it right.

111. cf. Aristotle *Metaphysics* A.4, 985b13-17. The three Abderite dialect words (which are recognisably related to more familiar attic forms) are rendered by Kirk, Raven and Schofield as ‘rhythm’ (*rhusmos*), ‘touching’ (*diathigê*) and ‘turning’ (*tropê*) (KRS 414).

112. See 110,27 and note.

113. *koinê ennoia*. Sometimes this is a technical term, and in the plural it is usually translated as ‘common notions’ or ‘common intuitions’ (as at 27,17 and 111,8). But here and at 118,12 it appears in the singular and seems to mean common sense.

114. There appears to be no apodosis to complete this extremely convoluted sentence. ‘These things have to apply to the primary contraries’ is almost a quotation of Aristotle’s ‘these things apply to the primary contraries’ (188a28-9), but the ‘have to’ belongs to 188a27 (‘For the principles have to ...’). Vitelli conjectures that part of the sentence has got missed out, and that it should have said ‘Since the following things have to apply to the first principles, they plausibly posited the contraries as principles; for all these things belong to the primary contraries ...’

115. cf. Themistius in *Phys. Paraphrasis* 18,20-2.

116. *koinê ennoia* (see above, n. 113).

117. See above, note to line 111,31.

118. ‘Real’ here translates *en hupostasei* which is normally translated ‘in reality’ or ‘existent’ (e.g. 15,1-2 in the first volume of this text). Here it seems to mean primary qualities that properly belong to the substance (perhaps as opposed to emergent properties).

119. 188b10-11.

120. The distinction between the privation and the negation is intended to capture the difference between items which have an alpha-privative name for the privation (as in *asunthesia* and *anarmostia*, meaning ‘non-composition’ and ‘disharmony’ respectively) and cases where the negation is formed by putting ‘*ouk*’ (meaning ‘not’) on the front of the positive word (as in ‘not-human’ and so on). The distinction is somewhat lost in the translation since English has relatively few

alpha-privative words, and a variety of other privatives (words beginning 'in-', 'un-' or 'dis-' for instance, or ending in '-less') and the prefix 'non' is more normal than 'not-' in forming negations that do not have a term of their own. Although English has a privative 'incomposite' this does not have a corresponding noun, so I have had to use a negation (non-composition) to translate what is importantly a privation (*asunthesia*) in the Greek. Although this is a lexical observation the point is supposed to be ontological, because Philoponus wants to make the distinction between the mere absence of the form (non-human could refer to anything that is not human) and the privation of the form (which is where the form is specifically absent in a case where it could be present). And moreover he wants to identify the proximate antithesis of the particular form which is the precise state that precedes the development of the positive quality of substance (as in the musical case where a specific wrongly tuned chord precedes the specific tuning that is desired.) Non-human or disharmony does not adequately identify this item. Aristotle explains two senses, one more generous and another more precise of privation in *Metaphysics* Delta Chapter 22, but as far as I am aware he does not develop the point that Philoponus is working on in this passage.

**121.** It is not clear precisely what 'after' means here. Either we are to think of a list of lesser things (things after human in the list are non-human because they do not make the grade). Or there may be an implicit contrast between things before we reach human (in a list arranged in ascending order) and things after the human (such as gods etc). It seems the word is not temporal, since we are considering the non-human as what comes *before* the development of a human being.

**122.** Our colour terms are culture-specific and it is hard to find exact correlations with the colour terms used by the Greeks; it is also hard for us to make sense of Aristotle's apparently uncontroversial belief that all colours are intermediate shades or mixtures of white and black. See Aristotle *De Sensu* Chapter 3, 439b16 and Theophrastus *De Sensibus* 12,59. It may help to envisage that *melan* and *leukon* are not exactly black and white but maximum depth of hue and minimum depth of hue. See further, Erkinger Schwarzenberg, 'Colour, Light and Transparency in the Greek World', in Eve Borsook, Fiorella Gioffredi Superbi, and Giovanni Pagliarulo (eds), *Medieval Mosaics* (Villa I Tatti, Harvard University Centre for Italian Renaissance Studies 17, 2000), 15-34.

**123.** 188b22-3, the words immediately preceding the present lemma.

**124.** cf. *Physics* 5 Chapter 5, 229a22. 'In the final words' perhaps means the last paragraph of this book, 192a29-34.

**125.** This incomplete sentence is re-started below, line 18, the remainder of this paragraph being parenthetical and explication of 'not all changing things change according to contraries'. Vitelli places the next fifteen lines in brackets. I have replaced this with a dash, to indicate an unfinished sentence, beginning a new paragraph with the return to this topic.

**126.** The distinction here is between a case where one lacks any opinions at all, prior to becoming virtuous (the situation of the child) and a case where one has opinions but they lack virtue (the case of the corrupt or distorted opinions that precede virtue in the adult case).

**127.** *huperphuê*. This almost certainly refers to souls. The context here does not make this clear, though it implies that they are things that change. However, the word occurs again below at 128,25, where it is explicitly *not* a reference to the heavenly bodies, but Philoponus immediately proceeds to talk about the soul. So the implication (both here and there) is that the soul is not natural but is beyond nature and yet subject to change in terms of form and privation.

128. The sequence is of ascending generality, indicated by the term 'above' taken to imply a stage up in a tree of divisions.

129. See above, 110,1-2 and note ad loc.

130. I am assuming that the word *pantês* is a misprint for *pantes* (125,7).

131. *aparamuthêtôs*. The arguments lacked the *paramuthia* required to convince the reader. See Philoponus in *DA* 238,37; 250,12; 468,23.28; 542,8. I am grateful to an anonymous reader for alerting me to these passages.

132. See above, 110,1-2 and note ad loc.

133. DK 21B29. Philoponus' text differs in minor details from that in Simplicius (in *Phys.* 188,32), probably for the better. Simplicius too names Porphyry as his source but attributes the lines to Anaximenes (erroneously).

134. Homer *Iliad* 7.99.

135. The 'he' in this sentence ought, by rights, to refer to the last named individual, namely Homer. However, the claim would be less of a surprise if it were about Xenophanes who is often treated as a precursor of Parmenides, so the reference to Homer may be supposed to be parenthetical. The second half of the sentence must be supposed to be about Parmenides, and it is to him that the titles *pros doxan* and *pros alêtheian*, ('Towards Opinion', 'Towards Truth') apply. Indeed this is a kind of formulaic refrain which recurs at 110,1; 116,18-19 and here, all about the contrast between the two parts of Parmenides' poem. For this reason I have changed Vitelli's punctuation so as to read a comma after *doxan* not after *Parmenidên*, and with the last phrase in parentheses. See above, n. 87 on the translation of the titles.

136. Above, 96.

137. *hyperphuês*. This appears, from the context here, to refer to the soul. See above, 122,22.

138. See Aristotle *DA* 417b5-7 ('For the thing that has knowledge comes (*ginetai*) to pay attention, which is either not alteration ... or it is another type of alteration').

139. The paragraph is fairly obscure. 'Things in creation' means things subject to development and decay – that is, sublunary bodies. The point seems to be to explain how eternal bodies can also be said to fall under the very general antithesis of form and privation. The claim is that an implicit contrast between form and privation is discernible in the contrast between substrate and form (even though the form is never lost and gained by turns as in changeable bodies). And circular motion is to be explained in terms of privation (of a particular position or location?) alternating with possession. Thinking of the heavenly spheres which rotate, the thought must be that the hemisphere that is at the top (so to speak) is at that time *not at the inverse position*, and is in this sense characterised by a privation. The notion of 'above the earth' does not make a lot of sense, however, for spheres that encase a spherical earth.

140. See above, 115,1.

141. *himas*, literally some kind of thin leather strip or thong.

142. The term 'rarity' (*manotês*) here must be a mistake; presumably an error for 'quality' (*poiôtês*) (as noted by Vitelli ad loc.).

143. *to aph'henos kai pros hen*, literally 'being derivative from one and relative to one'.

144. *Physics* 1.1, 184a18. See the first volume of this work, Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006).

145. 189a17-18.



146. 189a19.

147. 189a17-18.

148. 189a2.

149. 189a19.

150. Vitelli enters asterisks after *metabolês* to indicate that he suspects a lacuna. I have attempted a translation on the assumption that there is in fact nothing missing. I take *kai houtôs palin* to refer back to the previous method of generating an infinity (lines 18-20), where we found that there would be a super-infinite number of principles in virtue of moving from the infinite general classes to the ones contained in them. Here instead we move from a supposedly finite number to an infinite number, by finding that the opposites do not stay the same from one example to another, so that what were originally finite become more. The point is unpacked in the next sentence (starting *aei gar*) so that the rather allusive reasoning 'the same follows again: even if they were not infinite as pre-existent, yet they will be as those that emerge' (which is harder to reproduce in English than it is in Greek) becomes far less opaque once the point is explained. For this reason I think that it is possible that Philoponus wrote it as it now appears.

151. See textual notes: Vitelli suspected a lacuna after 'the same for every change' in this sentence.

152. Vitelli here indicates a lacuna.

153. Vitelli's text is possible and I have translated it, taking 'and that the substrate is one –' as parenthetical. The word 'one' in the next phrase ('there cannot be more than one') is feminine and must therefore refer to a contrariety, not to a substrate. Alternatively read *kai en tõi hupokeimenõi* (which might lie behind the reading noted for K at this point) and translate 'also in the case of the substrate', assuming that Philoponus is saying that Aristotle will proceed to demonstrate again, in the case of the material cause or substrate, that there too the ultimate opposition must be one.

154. Themistius in *Phys. Paraphrasis* 21,3-4.

155. The four arguments set out here ought to correspond with the four points articulated by Aristotle at 189a22, 26, 27 and 32. However, although the first and third are recognisable, it is unclear how the claims given below by Philoponus as the premises of argument 2 can be deduced from the second of these. Philoponus' arguments 2 and 4 seem rather to be elaborations of points implicit in Aristotle's reflections.

156. The example (which is in Aristotle) may be intended to allude to Empedocles.

157. There is a textual difficulty here but the overall sense seems to be clear.

158. Vitelli brackets this sentence. It is a repetition of the conclusion, already stated in the previous sentence.

159. That is, the destruction of substance includes the elimination of the accidents of the substance, but the elimination of particular accidents does not entail the destruction of the substance itself.

160. There are several options for what might be meant by 'the second passage' (*deuteros logos*). One option is the second argument in the current list of four dialectical arguments (see above 136,30-137,6) but neither Aristotle's text nor Philoponus' summary of it mentions form there. Another is Book 2 of the *Physics*, 193a28-b18. Another option is the *Metaphysics* (see *Metaph.* Z.3, 1029a29).

161. *Categories* Chapter 5, 2a11 and *passim*.

162. See above 137,12 and note ad loc.



163. GC 329b30-1 (the quotations are not word for word identical to MSS of GC).

164. GC 329b31-2.

165. That is, one verb is supplied which must be taken twice, as the verb for two different subjects, or in this case three (love, strife and then both of them). See above 90,6 and note ad loc.

166. Vitelli proposed deleting the word *ouk* (not) in this sentence. He puts it in square brackets in his text. I am not convinced that this is correct, since what follows seems to explain the idea that what is not substance might be prior to substance – an idea to be rejected, but first entertained. I have therefore retained the manuscript reading.

167. The approval here is for Anaximander. See above, 139,14.

168. There are some faults in the transmitted text. I have kept *ta hetera moria* (the other limbs) which appears in square brackets in Vitelli's text, because it appears to pick up and quote the similar discussion in the exposition of this section at 139,25; but if we retain it, then it is unclear how it relates to the rest of the sentence. I have translated without the word *met'* (with) entered in angle brackets by Vitelli, and read the genitive *enantioseōn tinōn* (of some contrarieties) as going with 'the other limbs', on the basis of the parallel with 139,25. In the final analysis it appears that the text in the manuscripts is incomplete in some way.

169. Philoponus here treats a large chunk of text; it goes across our chapter division, extending to 190a31 which is half way through our Chapter 7. There does not appear to be another 'Exposition and discussion' lemma until 155,11.

170. Philoponus seems to be thinking of a square, as shown in the diagram (supplied by me), with the two incompatible options opposite each other on a line (*enantiai*) and the coherent pairs formed in the columns (*hupallēloi*) and by diagonal links (*diagōnioi*).

171. The Greek would more readily yield 'It has been shown that in everything change is from one thing to another.' The argument seems to need the premise that change from one thing to another applies to everything (and that this means that everything is on the same scale of contrariety). When combined with the statement just made, that not just anything turns into just anything, but only if they are contraries, this yields the result that there must be one contrariety in order to yield maximum interchangeability. It is not clear where this has been established. At 131,15 Philoponus claims that the four elements change into each other by rarity and density.

172. Although this seems to be true, it is clearly meant to be a problem for the proposed theory, presumably because the lack of interchange between the two substrates would be fundamental. That is, there would be *no* means of changing wax to bronze or vice versa on the hypothesis that these were two exclusive substrates, out of which severally different parts of the world were made.

173. 189a13.

174. 'Out of', i.e. *ek*, also translated 'from' below. 'This', i.e. *tode*.

175. See 190a26 where Aristotle says this. It is not clear whether he means that we do not ever say that the bronze becomes a statue, or whether that is the proper and normal thing to say in a case such as this where there is a continuing material substrate, but that we do *sometimes* also say the statue is created 'out of bronze', as though the bronze were a privation. It appears that Philoponus thinks that we *always* say that the human being develops from sperm and egg (or sperm and menses on this theory of reproduction) and this is because it is a case of substantial change, the origin of a new thing with no enduring matter. The sperm and menses example is not given by Aristotle at this point, but seeds (of plants and animals)

appear later, in connection with absolute coming to be where the matter does not endure.

176. Here it appears that Philoponus is thinking of *certain* examples of change specifying the matter where we use only the 'this' terminology, as opposed to other examples such as the statue and the house (mentioned above, 144,32-145,2, and discussed in more detail below, 145,23-147,5) in which we assimilate the process to a process of substantial change *kat'ousian* and prefer the 'out of this' terminology for that reason.

177. cf. 144,24-6.

178. The language of approaching forms and yielding or making oneself scarce on the approach of another is reminiscent of Plato's account in the *Phaedo*, although the terminology is not identical. Cf. Plato *Phaedo* 102D5-103A1.

179. cf. 144,24-6 and 148,2.

180. An allusion to what we know generally as the four causes, taking matter and form to be two of these (material cause, formal cause) and the remaining two (efficient cause, final cause) as two other principles recognised by Aristotle but not included in this list of 'elements'.

181. The list of four options appears above at 143,6-10. The treatment of the two substrates / one contrariety option has just been identified in 189b18 (above 148,27). The treatment of the first option (one substrate / one contrariety) is in the passage from 189a21-b16 (see above 136,5-142,20).

182. i.e. in a table (or division) involving two contrarieties there are four limbs, two in each branch.

183. The parenthesis appears to clarify the fact that we are here envisaging two *contrarieties* woven together to generate output, not two contraries. So we need two pairs of contraries and envisage those working together to generate everything else. The idea that all the elements are combinations of hot / cold and wet / dry is traditional, going back to the Presocratic period, and is employed by a number of ancient medical writers although it is not clear whose theory it really is. It is attacked in *On Ancient Medicine* Chapter 1, CMG 11.36.3, but it is impossible to determine exactly who is the object of that hostility. See Geoffrey E. R. Lloyd, 'Who Is Attacked in *On Ancient Medicine*?' *Phronesis* 8 (1963), 108-26.

184. That is, each single contrariety (pair of contraries) is capable of generating everything by itself (so that 'from each other' means from the two limbs of the single contrariety).

185. cf. 189a13-14. See above, 144,11.

186. 189b27.

187. The text of Philoponus' lemma differs from the manuscripts of Aristotle (which read *legômen* in place of *legomen* and add *hêmeis* (we) before *legômen* and *prôton* (first) before *peri*).

188. 189b31.

189. This recapitulates a discussion relating to Book 1 Chapter 1. See Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle: London: Duckworth, 2006), 30-9.

190. On the idea of adjuncts that accompany all natural things see Book 1 Chapter 1 and Philoponus' discussion of that: Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006), 23-4.

191. 190b17-20 with omissions.

192. The majority of manuscripts read '*mousikou*' here, so that is perhaps what

Philoponus wrote. That is what I have translated, although it is probably a slip of the pen. The sense rather demands 'unmusical'.

193. 190b12; See below 159,4.

194. Referring to Aristotle's current usage whereby 'developing thing' (*ginomenon*) means that from which the development starts, and 'what develops' (*ho ginetai*), means the form towards which it is progressing, as Philoponus has just noted at 153,2-3. In his own voice, Philoponus is using 'developing thing' to refer to the latter (in accordance with Aristotle's subsequent usage) but alerting us to the discrepancy with Aristotle's expression here.

195. See above 144,30; 147,28-34. 'By turns' (*ana meros*) means not *both* of the *same thing*, but one or the other, severally, different ones for different cases.

196. These are changes in the categories of relation and position.

197. 190b5-9.

198. *homooousios*.

199. *GC* 1.5, 322a8.

200. Literally 'fleshlet' (*sarkion*): this term is used for the earliest stage of the embryo, i.e. the blastocyst in current terminology. See 52,30 of this commentary (in volume 1).

201. Paraphrase of 190b10-11.

202. The reference is to 190b12. See above, 153,2.

203. The usage that Philoponus is describing does not match English usage very well, since we do not naturally say 'a human being came to be' (but rather 'a human being was born'), and we have two expressions, 'come to be' and 'become', which translate the same word in Greek (but we do not use 'become' on its own, for instance to say 'a human being became', as Greek does). In this paragraph the terms 'become', 'come to be', 'development' and 'born' all translate terms related to *gignesthai* in Greek.

204. Philoponus reads *kai pros ti heteron*. Manuscripts of Aristotle have *kai pros heteron*. Philoponus' comment is about the word *heteron* ('other', or 'else'), which is the cause of surprise, not the *ti* ('something').

205. Manuscripts of Aristotle have the plural ('the substances') here.

206. 156,18.

207. 156,22-157,21.

208. 190a2. See above 153,2.

209. The sentence is hard to construe at various points. The translation given here seems the least problematic way to make sense of it without emending the text. Vitelli offers a possible supplement in the apparatus (which would render the sense of the last two clauses as follows: 'that these are the things out of which each is composed. But each is composed out of the substrate and the form').

210. '*Per accidens*' translates *kata sumbebêkos*. This might also be translated 'in respect of attribute'.

211. It appears that Philoponus reads *ton logon* (not *tous logous*) here. See W.D. Ross (ed.), *Aristotle, Physics: A Revised Text with Introduction and Commentary* (Oxford: Clarendon Press, 1936) at 493.

212. It appears that Philoponus has a text in which *eis tous horous* is written as a variant reading (for *eis tous logous* at 190b22). See Hermann Diels, *Zur Textgeschichte der Aristotelischen Physik* (Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin, Philologisch-Historische Klasse, 1882.1; Berlin, 1883) at 9, and Ross (ed.), *Physics* at 493.

213. *deiktikon*. I have taken this to mean a thing we can point to. Alternatively, it might mean 'this is indicative' (but indicative of what?).

214. cf. 160,21-2.

215. It is puzzling that a class of 'entities' should be subdivided into some that do not in any way qualify as entities, and others that do. The reference to 'entities (*onta*) in general' needs to be read as 'things', in a rather vague sense, rather than as things that qualify for the description 'entities' in either the strict or the looser sense permitted here.

216. cf. 51,26; 95,30.

217. Although the whole of this passage is clearly written with the central section of Plato's *Timaeus* in mind, it does not precisely summarise points made explicitly there about the kind of procedure to be used in grasping the idea of the receptacle. The process of elimination or apophatic thinking corresponds roughly to the work done at *Timaeus* 50D to 51E, but that also involves analogical reasoning (on which see below, 162,21), using the analogy of the base for perfumes. Analogical reasoning is also supplied at 50A-C, where Timaeus uses the example of figures made out of gold.

218. The 'first cause' presumably refers to the Form of the Good and / or the Neoplatonic One. Again analogical reasoning is offered for this at *Republic* 506E-509B (the Sun), 509D-511E (the Line) and 514A-518C (the Cave). The nearest to apophatic description occurs at 509B where the Good is said to be not being but beyond being.

219. Plato *Timaeus* 52B.

220. Reading *aphaireseôs* with Vitelli (manuscripts have *anaireseôs*, which can also mean destroy but is perhaps a less appropriate term for what is intended to describe the apophatic method, for which the term was *aphairesis* at 162,6). See also below, 192,3-7.

221. Alluding perhaps to *Republic* 506E, but the plural ('they say', 'they made', 'they found') is slightly strange.

222. 190b23.

223. There are some small problems with the text in this sentence. 'Or' has to be supplied for the second alternative, as suggested by Vitelli, and the nominative *hê sunkrisis* is a bit surprising and seems to need a verb ('is').

224. The referent of 'the first' (*tên prôtên*, feminine) is opaque here in the Greek but slightly less opaque than in the English. It must mean the first of the two things just mentioned, i.e. the privation (which is mentioned before the matter in the Greek, as in the English rendering given here). For another example of the use of 'first' to refer to the first in a list of two things, see below, 172,14.

225. Philoponus has *sumbebêken* (verb) whereas the manuscripts of Aristotle read *sumbebêkos* (adjective). The sense is not affected.

226. 190b23-4.

227. 190b28.

228. Vitelli notes a lacuna here and suggests it might be filled with a phrase such as 'But not two in all respects ...'.

229. See above, 162,5.

230. Texts of Aristotle vary in detail from what Philoponus gives here, adding *houtôs* again before *hen* as well as before *mia*. Some manuscripts have *on* instead of *hen*.

231. See above 137,27.

232. See above 164,25.

233. The text reads *mia de hê ho logos*. The textual problem is about how to read the words here read as *hê* (*êta* with a rough breathing, nominative of the feminine definite article) and *ho* (omicron with rough breathing, nominative of the masculine definite article). Depending on breathings, accents and other ways of

articulating the words, both letters could be read in a variety of other senses. Philoponus is recommending construing them here as the feminine and masculine definite articles respectively.

234. 191a18.

235. See *Metaphysics* Z.3.

236. See above, 89,3-30 (where Philoponus notes the motivation of Anaxagoras to adhere to the 'nothing from nothing' axiom and account for development of contraries from contraries); cf. also 94,18-25.

237. The quotations are from 191a24-7. See further below, 174,17.

238. cf. 94,21.

239. 185a11; 186a11. Discussed by Philoponus at 30,5 and 59,7. See further below, 174,26.

240. I am here reading Vitelli's text without his square brackets (which are designed to excise the expression 'i.e. the matter'). The same sense is obtained by reading (with t) *all' hêi sumbebêke tōi ex hou kath' hautō ginetai, toutesti tēi hulēi, on einai, toutestin eidopepoiēsthai*.

241. I have translated the manuscript reading as it is, without the word *ou* (meaning 'not', which is supplied by Vitelli). Supplying the word 'not' enables us to make this sentence say that the supposed absurdity *does not follow*. The translation would be 'the absurd idea that the developing thing is there already before coming into being does not follow'.

242. cf. 190b17-191a2.

243. *Categories* Chapter 10, 12a26-33.

244. Or 'in the same thing'.

245. For the discussion of these thinkers see Chapters 2 and 3 of *Physics* Book 1.

246. Possibly this is a reference to the exposition and discussion section above, 169,3-174,12.

247. Above 144,27-147,34.

248. Vitelli marks a lacuna here at the end of the sentence. See his apparatus for the manuscript situation. The need for emendation is due to the anacolouthon: after 'in one case' we go straight into the examples that illustrate the fact that we say one thing about one kind of case and another about another, but we are never given the 'in another case' phrase. In addition, the opening 'But the points about ...' is never completed. Arguably however the anacolouthon is as Philoponus wrote it, since the examples illustrate both kinds of language.

249. 191a34-5.

250. 191a35. The terminology of 'this' is implicit here in so far as the substrate is the subject of the verbs, as in 'this comes to be that' as opposed to the emerging thing being the subject which emerges 'out of' some previous item.

251. I follow Vitelli in retaining these words at lines 8-9 (following manuscript K) and removing them from lines 18 to 19 where they seem not to belong. I have not translated the words in square brackets at 18-19 below.

252. Philoponus appears to say that Aristotle affirms this claim in the indicative, but he must surely mean that Aristotle diagnoses this as the assumption made by the ancients.

253. Texts of Aristotle normally have 'from what is not' rather than 'not from what is'. The comment implies that Philoponus thinks the unexpected 'not from what is' needs to be explained.

254. On the text, see above, n. 251.

255. Philoponus has abbreviated his citation of Aristotle to focus on just the words to be explained in what follows. The selected words come from lines b11 and 12.

256. 191b13.

257. 191b18.

258. The sentence does not seem to say exactly what Philoponus should be saying here, and I suspect that some of the words have got misplaced or wrongly added in this sentence. The sentence should surely say that fire develops from air, but also (in a sense) from being (but from being only *per accidens*, just in so far as it happens that the air from which the fire develops has being).

259. See above, n. 106. The point here is that humans beget humans not as material cause but as efficient cause. By contrast when wasps emerge from a rotting corpse, they derive their matter from it. However, it was not in virtue of the fact that it was an animal that it serves as the matter, but rather in virtue of the fact that it was matter of the right sort (which happened to be an animal).

260. There are some small discrepancies in the readings between Philoponus and the received text of Aristotle here.

261. 191b21.

262. That is, in fact the animal developed from non-animal, as just explained, and animal does come from not-animal in the relevant respect, so as to count as *per se* development.

263. This paraphrases 191b25, part of the sentence immediately preceding the current lemma.

264. There is a misprint (*eta* for *epsilon*) in Vitelli's text here. *Lelukotês* should clearly read *lelukotes*, and this yields the sense that I have translated here. There is no way of construing the text as given in *CAG*.

265. I have re-punctuated the sentence here (182,17-18), omitting the commas round the first *phêsi*, and changing the comma after the second *phêsi* to a full stop. This makes better sense of both the grammar and the content of the sentence. Vitelli's punctuation would attribute the first 'he says' to Aristotle, not Plato.

266. *Timaeus* 50B.

267. See Aristotle's earlier treatment of this at 187a16-20; and Philoponus' discussion on that, above 91,16-93,13 (and notes ad loc.).

268. Plato *Sophist* 258A; See above 82,26.

269. The argument above, to show that Plato was implicitly aware of the privation but took it to be conceptually and substantially the same thing as the matter is intended to be exegesis of what Aristotle means. Philoponus now intends to challenge that allegation against Plato.

270. See 58,7-13 (in Osborne, *Philoponus: On Aristotle Physics 1.1-3* (Ancient Commentators on Aristotle; London: Duckworth, 2006)).

271. The cross-reference is perhaps to 81,31-82,9.

272. Construing this sentence of Aristotle is not easy. I have translated in accordance with the interpretation offered by Philoponus below.

273. A verb has to be understood with the adverbs in the Greek and I am assuming that it is a verb of saying or writing. The neuter definite article (*to sunaitia*) serves as inverted commas to pick out an expression or piece of vocabulary. It should be understood that Philoponus means that the idea it expresses (as well as the term used) is Platonic, and is well-chosen for the purpose that Aristotle has in mind. The reference to Plato is to *Timaeus* 46C-E.

274. Themistius in *Phys. Paraphrasis* 33,2-5.

275. 192a22.

276. The meaning is probably 'nor does the privation seek for the form' rather than 'neither does the privation seek itself'. The thought is that if privation seeks form then it seeks its own destruction because the form destroys the privation.



Alternatively the nominative (*oute hê sterêsis*) is a mistake and the more predictable thought 'nor does it seek the privation' is intended.

277. That is, the privation of the form of human being.

278. The argument is intended as a *reductio*, so this conclusion (being absurd) rules out the initial hypothesis, that matter and privation are the same.

279. i.e. something desirable to all.

280. That is, the definitional specification (*logos*) of matter itself does not, of course include the form, although it might perhaps be defined as something that lacks and seeks form.

281. The purported quotation is more a paraphrase or half remembered phrase from Aristotle *Cael.* A9, 279a28.

282. A close paraphrase of *Metaphysics* Lambda 7, 1072b13.

283. At this point we have completed the evidence in support of the point marked (ii) above, that is evidence from things Aristotle says elsewhere. The point is to show that the claim is only that matter is *temporally* uncreated, not that it is causally uncreated. What Aristotle says elsewhere is evidence that he did think that it was causally dependent, derivative from a source. So any claim that it is uncreated must be about time not about its causal status. Having completed this parenthetical treatment of point (ii), we now switch back in the next sentence to provide the support for the point marked (i). There is no connective at this point and it is not clear how to punctuate precisely so that the parenthetical remarks are strung together to make good syntax. There is clearly some asyndeton. But I do not think there is a lacuna (a lacuna is marked here by Vitelli).

284. 192a30.

285. 192a33-4.

286. Here my translation differs from that given by Sorabji in Richard Sorabji, *The Philosophy of the Commentators 200-600 AD: A Sourcebook*, vol. 1: *Psychology (with Ethics and Religion)* (London: Duckworth, 2003), 201. He takes *hê holê dêmiourgia* at 191,15 to refer to 'The Demiurge's universal creation', meaning the creation of universals, indicating the source from which the universals are derived. I have taken *ek* to mean 'outside of' and *hê holê dêmiourgia* to mean 'the entire creation', conveying the idea that the forms do not pre-exist anywhere, in any kind of created existence. See also above, 97,25-7, and discussion in the Introduction to this volume.

287. It is not exactly clear what *eis ton topon* (translated 'on the topic') means here. Other options are 'ad loc.' (referring to the lexis section below); or 'with respect to the notion of place' (referring to a later treatment in another part of this commentary); or 'at the relevant place' meaning that Aristotle gives additional arguments at some other place. I am grateful to Richard Sorabji for suggesting the preferred translation.

288. 192a31.

289. *Metaphysics* Lambda 10, 1076a4 citing Homer *Iliad* 2.204.

290. The phrase is from 189a19. Philoponus is referring back to his discussion at 133,22-134,11. There Philoponus canvassed a number of interpretations of the phrase quoted, and among those he *rejects* is one that suggests that Aristotle is referring to the forms prior to the many. His own preferred interpretation at that point is that the reference is to universal formal principles that are found in all cases of change. The discrepancy between this cross-reference and the earlier passage might indicate that the earlier text has been revised for a later edition.

291. See the analysis of *Physics* 184a10-16, above in *Phys.* 4,12-9,3 (in volume one).



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## English-Greek Glossary

abide: *hupomenein*  
 absolutely: *haplôs*  
 absorbent: *sunkritikon*  
 accessible: *gnôrimon*  
 accident: *sumbebêkos*  
 account: *logos*  
 active: *poiêtikon, poioun*  
 activity: *energeia*  
 actual: *energeiâi*  
 adjuncts: *parakolouthounta*  
 adult: *teleios*  
 affection: *pathos*  
 affective qualities: *pathêtikai poiôtêtes*  
 affirm: *phêmi*  
 agent: *poioun*  
 agree: *sugkhôrein*  
 alteration: *alloiôsis*  
 analogy: *analogia*  
 analysis: *analsusis, logos, diorizein*  
 angular, angled: *gegôniômenos / a / on*  
 animate: *empsychon*  
 antecedent: *sunêmmenon*  
 antithesis: *antikeimenon, antithesis*  
 apophatically: *ex apophaseôs*  
 apply: *huparkhein*  
 appropriate: *prosêkon*  
 argument: *epikheirêma, logos, sullogismos*  
 arm / limb (of classification): *morion*  
 arrange: *kosmein*  
 arrival: *parousia*  
 art: *tekhnê*  
 artefact: *tekhnêtos*  
 artificial: *tekhnêtos*  
 assent: *sugkhôrein*  
 assert: *kataphanai*  
 assertive: *kataphatikos*  
 assume: *paralambanô*  
 atom: *atomos, hê*  
 atomic: *atomos*  
 attempt: *epikheirêma*  
 attribute: *sumbebêkos*  
 auxiliary cause: *sunaition, sunaitia*  
 axiom: *axiôma*

be, be there, there is: *huparkhein*  
 become: *gignomai*  
 becoming: *genesis*  
 bed: *klinê*  
 beget: *gennaô*  
 beginning: *arkhê*  
 being: *on, to on, ousia*  
 belong: *huparkhein*  
 black: *melas*  
 blackboard: *abakion*  
 blastocyst: *sarkion*  
 block: *lithos*  
 bodily element: *sôma*  
 body: *sôma*  
 capacity: *dunamis*  
 category: *katêgoria*  
 cause: *aitia, aitos, aition*  
 celestial things: *ta ourania*  
 change (v.): *metaballein*  
 change (n.): *metabolê*  
 choose: *lambanein*  
 claim (v.): *phêmi*  
 claim (n.): *thesis*  
 classification: *diairesis*  
 co-destroy: *sunanairein*  
 cold: *psychron*  
 collect: *sunkrinesthai*  
 collection: *sunkrisis*  
 column: *sustoikhia*  
 combination: *sunkrisis, sunthesis*  
 combine: *sunkrinesthai, suntithenai*  
 come (from): *gignomai*  
 come into existence, come into being, come to be: *gignomai*  
 coming-to-be: *genesis*  
 commentators: *exêgêtai*  
 common: *koinos, koinê*  
 common intuition: *koinê ennoia*  
 common sense: *koinê ennoia*  
 comparison: *sunkrisis*  
 complete: *enteles, teleios*  
 complex: *sunthetos*  
 components: *suntithemena*  
 compose: *suntithenai*

composite: *sunthetos*  
 composition: *sunkrisis*, *sunthesis*  
 compound: *sunthetos*  
 comprehend: *gignôskein*, *ginôskein*,  
*gnônai*  
 compress: *puknoun*  
 conceptually: *logôî*, *kata ton logon*  
 conclude: *sunagein*  
 conclusion: *hepomenon*, *sumperasma*  
 concurrence: *sundromê*, *sunodos*  
 condensation: *puknôsis*  
 condense: *puknoun*  
 conflict: *enantiotês*  
 consequence: *episumbainon*,  
*hepomenon*  
 consider: *hupotithenai*, *lambanein*  
 continuity: *sunekheia*  
 continuous: *sunekhes*  
 continuum: *sunekhes*  
 contradiction: *antiphasis*  
 contrariety: *enantiosis*, *enantiotês*  
 contrary: *antikeimenon*, *enantios*  
 contribute: *suntelein*  
 correlated: *sustoikhos*  
 craft: *tekhnê*  
 craftsman: *tekhnitês*  
 create: *poiein*  
 creation: *demiourgia*, *genesis*  
 creative: *poioun*  
 criticise: *elegkhein*, *elegxai*  
 criticism: *elegkhos*  
 cut: *tomê*

dark: *melas*  
 decay (v.): *phtheiresthai*  
 decay (n.): *phthora*  
 define: *periorizein*  
 definition: *horismos*, *horos*, *logos*  
 definitive, definitional: *horistikos*  
 demonstrate: *deiknumi*  
 demonstration: *deixis*  
 demonstrative: *apodeiktikos*  
 dense: *puknon*  
 density: *puknotês*  
 description: *logos*  
 designate: *kalein*, *onomazein*,  
*prosagoreuein*, *sêmainein*  
 destroy: *phtheirein*  
 destructible: *phthartos*  
 destruction: *phthora*  
 destructive: *phthartikos*  
 develop: *gignomai*  
 developing thing: *ginomenon*  
 development: *genesis*

dialectic: *dialektikê*  
 dichotomy: *diairesis*  
 difference: *heterotês*  
 differentia: *diaphora*  
 difficulty: *aporia*  
 directly: *haplôs*  
 discrete: *diôrismenon*  
 discussion: *logos*  
 disharmony: *anarmostia*  
 disposition: *diathesis*  
 dissipation: *ekdiaphorêsis*  
 distinction: *diakrisis*  
 divine: *theios*  
 division: *diairesis*, *tomê*  
 do: *poiein*  
 doctor: *iatros*  
 draw: *lambanein*, *poiein*, *sunagein*

effect (n.): *pathos*  
 effect (v.): *poiein*  
 efficient: *poiêtikon*  
 efficient cause: *poiêtikon aition*  
 egg: *sperma*  
 elastic: *himas*  
 element: *stoikheion*  
 elemental: *stoikheiôdês*  
 elementary: *prosekhês*  
 elimination: *aphairesis*  
 emerge: *gignomai*  
 endure: *hupomenein*, *sunistasthai*  
 enquiry: *theôria*  
 entity: *on*  
 equipollent: *isosthenês*  
 error: *planê*  
 essence: *ousia*  
 eternal: *aidios*  
 examine: *elegkhein*, *elegxai*  
 excess: *hyperokhê*  
 exegetes: *exêgêtai*  
 exist: *einai*, *huparkhein*, *huphistêmi*  
 existence: *huparxis*  
 expert: *epistêmôn*  
 explain: *ektithenai*  
 explanation: *aitios*, *aition*  
 expression: *phônê*  
 extract / be extracted: *ekkrinein*,  
*ekkrinesthai*  
 extraction: *ekkrisis*

female: *thêlu*  
 feminine: *thêlukon*  
 figure: *morphê*  
 final: *teleutaïos*  
 final (cause): *telikon*

finite: *peperasmenon*  
 flesh: *sarx*  
 fleshlet: *sarkion*  
 form (n.): *eidos, morphê*  
 form (v.): *poiein*  
 formal: *eidikos, eidikê*  
 formally: *eidei*  
 format: *eidopoiein*  
 form-giving: *eidopoios*  
 formless: *aneideos, aneideon*  
 full term: *teleios*

gather: *sunagein*  
 general: *koinos, koinê*  
 generate: *gennaô*  
 generic: *katholou*

harmony: *harmonia*  
 heap: *sôros*  
 heavenly bodies: *ta ourania*  
 homonymous: *homônumos*  
 horse: *hippos*  
 hot: *thermon*  
 house: *oikia, oikos*  
 human, human being: *anthrôpos*  
 hypothesis: *hupothesis*

idea: *ennoia*  
 identify: *sêmeinein*  
 ignorance: *anepistemosunê*  
 imitate: *mimeisthai*  
 immutable: *ametablêtos, ametablêton*  
 impasse: *aporia*  
 impassible: *apathês*  
 imperishable: *aphthartos*  
 imply: *emphainô*  
 incorporeal: *asômaton*  
 indefinite: *aristos*  
 indestructible: *aphthartos*  
 indeterminate: *aristos*  
 indicate: *sêmeinein*  
 indiscriminate: *sunkekhumenon*  
 individual: *atomon*  
 inexperience: *apeiria*  
 inference: *sullogismos*  
 infinite: *apeiron*  
 intellect: *nous*  
 intelligible: *noêton*  
 intermediate: *metaxu*  
 intuition: *ennoia*  
 isolate: *khôrizein*

juxtaposition: *parathesis*

kind: *poion*  
 kinship: *koinônia*  
 know: *eidenai, gignôskein, ginôskein, gnônai*  
 knowledge: *episteme, gnôsis*

last: *menein*  
 likeness: *homoiotês*  
 limit: *horos*  
 limited: *peperasmenon*  
 linguistic expression: *ta onomata*  
 linguistic usage: *lexis*  
 location: *khôra*  
 log: *xulon*  
 lyre: *lura*

maggot: *skôlêx*  
 magnitude: *megethos*  
 make: *kathistemi, poiein*  
 manifestation: *ekphansis*  
 material: *hulê*  
 matter: *hulê*  
 mean: *legein, phêmi, sêmeinein*  
 meaning: *sêmeinomenon*  
 menses: *katamênion*  
 method: *methodos*  
 mimic: *mimeisthai*  
 mind: *nous*  
 mixture: *krasis*  
 mode: *harmonia, tropos*  
 moisture: *hugron*  
 monad: *monas*  
 motion: *kinêsis, metabolê*  
 motionless: *akinêton*  
 music: *mousikê*  
 musical: *mousikos*  
 musician: *mousikos*

name (n.): *onoma*  
 name (v.): *onomazein*  
 natural: *phusei, kata phusin, pephuke, phusikon*  
 natural philosopher: *phusikos*  
 nature: *phusis*  
 necessity: *anankê*  
 negation: *apophasis*  
 nominal: *onomati*  
 notion: *ennoia*  
 number: *poson*  
 numerically one: *arithmôî hen, arithmôî mia*  
 nurse: *tithênê*

object: *pragma*

objection: *epikheirêma*  
 occur: *gignomai*  
 offer: *tithenai*  
 opinion: *doxa*  
 opposed: *enantios*  
 opposite: *antikeimenon*, *enantios*  
 opposition: *enantiotês*  
 option: *tmêma*  
 order: *kosmein*  
 origin: *arkhê*, *genesis*  
 otherness: *heterotês*  
 outlook: *ennoia*

paradigmatic (cause):  
     *paradeigmatikon*  
 part: *meros*, *morion*  
 partake: *metalambanein*, *metekhein*  
 participate: *metekhein*  
 particular: *merikon*  
 partless: *amerês*  
 pass away: *phtheiresthai*  
 passible: *pathêtikos*  
 passing away: *phthora*  
 passive: *pathêtikos*  
*per accidens*: *kata sumbebêkos*  
 perceptible: *aisthêton*  
 perception: *aisthêsis*  
 perfection: *teleios*, *teleiotês*  
 perish: *phtheiresthai*  
 perishable: *phthartos*  
 person: *anthrôpos*  
 physical: *phusikon*  
 physicist: *phusikos*  
 piece: *morion*  
 place: *khôra*, *topos*  
 plank: *xulon*  
 plural: *polloi*, *polla*  
 plurality: *plêthos*  
 posit: *hupotithenai*, *tithenai*  
 position: *thesis*  
 posterior: *husteron*  
 potentiality: *dunamis*  
 predicate: *katêgorein*  
 predication: *katêgoria*  
 premise: *protasis*  
 presence: *parousia*  
 preserve: *sôizein*  
 presiding: *epistatousê*  
 prime: *prôtos*  
 principle: *arkhê*  
 prior: *proteron*  
 privation: *sterêsis*  
 problem: *aporia*  
 produce: *gennaô*

productive: *poiêtikon*  
 propose: *hupotithenai*  
 proximate: *prosekhês*  
 psychological: *psukhikos*  
 pure: *katharos*  
 purely: *haplôs*  
 puzzle: *aporia*

quality: *poion*, *poiotês*  
 quantity: *megethos*, *poson*, *posotês*

rare: *manon*  
 rarefaction: *manôsis*  
 rarity: *manotês*  
 rational: *logikos*  
 real: *en huparxei*, *en hupostasei*,  
     *pragmatikê*  
 reality: *on*, *to on*, *ousia*  
 reason: *logos*  
 reasoning: *logismos*, *logos*,  
     *sunêmnenon*  
 receptacle: *dexomenon*, *to*  
 reductio: *entreptikon*  
 refer: *prosagoreuein*, *sêmainein*  
 refute: *elegkhein*, *elegxai*  
 region: *topos*  
 relation: *logos*, *pros ti*  
 relative: *pros ti*  
 remain: *hupomenein*, *menein*, *sôizein*  
 remove: *khôrizein*  
 resemblance: *homoiotês*  
 resolution: *epilusis*  
 resolve: *epiluesthai*, *luein*  
 retain: *sôizein*  
 role: *logos*

say: *legein*, *phêmi*  
 science: *epistêmê*  
 scientifically: *epistêmonikôs*  
 section: *tmêma*  
 seed: *sperma*  
 segment: *tmêma*  
 self-subsistent: *authupostaton*  
 semen: *sperma*  
 sensation: *aisthêsis*  
 sense: *nous*, *sêmainomenon*  
 separate: *khôrizein*  
 separate off / out: *ekkrinein*,  
     *ekkrinesthai*  
 separated: *khôriston*  
 separation: *diakrisis*, *ekkrisis*  
 several: *polloi*, *polla*  
 shape (n.): *morphê*, *skhêma*  
 shape (v.): *skhêmatizein*

shapeless: *amorphos*  
 share in: *metekhein*  
 shared: *koinos, koinê*  
 signify: *sêmainein*  
 similarity: *homoiotês*  
 simple: *haplos*  
 simpliciter: *haplôs*  
 simply: *haplôs*  
 simultaneous: *suneinai*  
 solid: *sôma*  
 solve: *epiluesthai, luein*  
 soul: *psukhê*  
 sound: *êkhos*  
 source: *arkhê*  
 space: *khôrion*  
 speak: *legein*  
 species: *eidos*  
 specification: *logos*  
 sperm: *sperma*  
 statue: *andrias*  
 stick: *xulon*  
 stone: *lithos*  
 straightforwardly: *haplôs*  
 string: *khordê*  
 structure (n.): *skhêma*  
 structure (v.): *skhêmatizein*  
 study: *theôria*  
 subsist: *huparkhein, huphistêmi*  
 substance: *ousia*  
 substantial: *kat'ousian, ousiôdês*  
 substrate: *hupokeimenon*  
 subsume: *anagein*  
 subtraction: *aphairesis*  
 suggest: *hupotithenai*  
 supervene: *epignesthai*  
 suppose: *hupolambanein, hupotithenai, lambanein*  
 surface: *epiphaneia*  
 survive: *hupomenein, menein, sôizein*  
 sweet: *gluku*  
 syllogism: *sullogismos*  
  
 table of correlates: *sustoikhia*  
 take: *lambanein, paralambanein*  
 technician: *tekhnitês*

term: *onoma, phônê*  
 terminology: *prosrhêma*  
 testimony: *tekmêrion*  
 text: *lexis, logos*  
 theory: *doxa*  
 thesis: *hupothesis*  
 thing: *on, pragma*  
 thinking: *ennoia*  
 three-dimensional: *trikhêi diastaton*  
 timber: *xulon*  
 tout court: *haplôs*  
 transcend: *huperekhein*  
 transcendence: *huperokhê*  
 transcendent: *exêirêmenon*  
 true, the truth: *alêthês, alêthes*  
 tuning: *harmonia*  
 type: *tropos*

uncreated: *agenêton*  
 uncuttable: *atomos*  
 undergo: *hupomenein*  
 underlie: *hupokeimai*  
 understand: *noein*  
 understanding: *epistêmê*  
 uniform parts: *homoiomereî, homoiomereia*  
 universal: *katholou*  
 universally: *haplôs*  
 universe: *ouranos, to pan*  
 unknowable: *agnôston*  
 unlimited: *apeiron*  
 unmusical: *amousos*  
 usage: *khêrsis*

void: *kenon*  
 way: *tropos*  
 wet: *hugron*  
 white: *leukos, leukon*  
 wood: *xulon*  
 wooden: *xulinos*  
 word: *onoma*  
 world: *kosmos*

yield: *hupexistamai*

## Greek-English Index

- abakion**, blackboard, 115,20; 116,3-8; 146,22; 162,25
- adamas**, adamant, 111,11
- agenêton**, uncreated, 152,6; 184,19-22; 185,5; 189,10-27; 190,18.29; 191,4-9
- agnoein**, to be unaware, 183,15
- agnôston**, unknowable, 96,3.13.14; 101,27.29; 102,4.8.9; 108,9
- agônios/a/on**, without angles, 116,30; angle-free, 117,1.17.19
- aidios**, eternal, 94,24; 152,15-16
- aisthêsis**, perception, 151,21; sensation, 122,32; 123,1-16 *passim*; 124,16; 125,8.24.25; 126,7; 127,4-16 *passim*
- aisthêton**, perceptible, 139,17
- aitia**, cause, 88,5.6; 89,11; 92,17; 93,1; 108,25; 135,19; 147,12; 187,5.25; 193,2
- aitios, aition**, cause, 87,14; 92,14; 107,20.22.23.24; 111,23; 114,24; 133,24; 134,4; 135,21; 160,2; 162,8; 179,4.5; 187,11; 188,3; 191,17.25.29; explanatory of, 138,11.12; explanation for, 136,29; deliver, 173,32; source, 192,25
- aitiôtatos**, most causal, 163,6
- akinêton**, motionless, 170,6
- akolouthein**, consequence, 174,27
- akolouthos**, logical, 90,26.28; 108,18; 109,13
- akolouthôs**, logically, 99,10
- akouein**, understand, 104,14; 140,16; 176,18; interpret, 119,16 consider, 132,15
- alêthês, alêthes**, true, 133,27; 134,1.12; 138,32; 179,18.19; correct, 103,32; the truth, 89,14; 108,19; 109,15; 127,30; 144,9.11
- alloiôsis**, alteration, 87,4.6.7; 95,11.18.19; 112,9; 128,32; 155,19; 156,21.22; 157,18; 167,16
- amelei**, in any case, 134,29; 152,9
- amerês**, partless, 93,2
- amesôs**, immediately, 115,25
- ametablêtos, ametablêton**, immutable, 133,32; unchanged, 148,14; 156,14; unchangeable, 88,13; 118,5.6; incapable of changing, 140,1; not subject to change, 185,6
- amorphos**, shapeless, 114,8
- amousia**, unmusicality, 145,11; 163,29
- amousos**, unmusical, 111,17; 145,10.17; 147,21; 148,6; 152,21-8; 153,10.14.24.26; 154,13.14; 155,19.20; 163,19; 166,4.5; unmusical person, 144,27-8; 147,21
- amphoreus**, jug, 190,14; amphora, 97,14
- anadekhesthai**, receive, 131,21; 154,11
- anagein**, refer back, 150,8.12; reduce, 111,1; 131,30; subsume, 128,23; 129,5.25; 130,3; 131,6.16.17.22.23; 132,2.13.33; 162,28
- anairein**, eliminate, 109,2; 181,3.22; 189,18.20.23.24; undermine, 96,11; 128,3; exhaust, 105,3.4.18; 109,18
- anakamptein**, recur, 94,11;
- analambanein**, embarks again, 127,23; rehearses, 186,14
- analogein**, corresponds, 91,33; is analogous, 168,8
- analogia**, analogy, 115,15.18; 123,25.26; 126,13; 162,20; 163,1.5; 166,13.22; 192,5; analogical, 123,28.30
- analogos**, analogous, 114,25
- analuein**, break down, 115,23; analyse, 160,7-10; dissolve, 180,11
- analusis**, analysis, 104,25; 160,6
- anankaion**, force, 149,10; necessary, 105,9; 166,16
- anankê**, necessity, 107,22; 114,18; 115,5; 132,27; must (necessarily), 100,17.19; 102,1; 107,20; 108,21;



- 109,7.32; 115,17; 120,30; 121,27;  
127,27.29; 134,18.25; 135,22; 150,1;  
154,10; 155,23; 169,22; 189,23;  
necessary, 100,13; 102,31;  
105,8.11; 134,20.27; 135,10; 144,4;  
149,10; 154,14; 187,14; inevitably,  
115,1; need, 102,25
- ananké, pása**, entirely necessary,  
119,2; 128,21; 134,17; 143,6; 185,4;  
188,3 every necessity, 89,19.25.31;  
100,3; 105,17; 115,9; 184,20;  
absolute necessity, 134,17
- anaphaneisa**, which has been  
expounded, 182,4
- anarmostia**, disharmony,  
113,11.21.34; 114,3; 115,20;  
116,1.7.8.10.13.16; 120,3.4.6.26;  
wrongly tuned, 113,16;  
wrong-tuning, 113,32.33.34
- anaskeuazein**, be destructive, 96,7
- andrias**, statue, 111,27.28; 112,32;  
120,25.29; 121,6.9.11; 144,31.32;  
146,12-147,27; 155,21; 156,25;  
159,25; 160,1.2; 169,2; 172,10;  
176,1.2; figure of a man, 144,1.2;  
*ouk andrias*, non-statue, 147,10
- aneideos, aneideon**, formless,  
174,11; 182,20; 190,2-3.14; *to*  
*aneideon*, formlessness, 162,18;  
190,6
- anepistêmosunê**, ignorance,  
122,3.5.7.16; 130,28
- aniatros**, non-doctor, 175,13-15; 177,7
- anoëtos**, unintelligent, 101,5.11.16;  
106,21; 107,2; unintelligible, 101,16
- anomoïomerê**, non uniform things,  
87,16; 88,3
- antapodosis**, alternative,  
90,21.24.28; 91,5; 93,16
- anthrôpos**, human being, 89,17.18;  
93,2.4; 97,2-11; 98,26-34; 99,17;  
103,7-34; 104,2; 107,6-21;  
113,10.20; 114,21-6; 115,2-28;  
120,14; 130,9.30; 144,32; 145,30.31;  
146,24; 147,8-27; 148,5; 155,28;  
156,3; 158,13; 162,6; 164,26;  
175,31; 179,4; 188,10-14; human,  
99,15.18; 114,22; 115,3; 120,10-17;  
145,2; person, 140,30;  
145,16.20.21; 152,21-153,27;  
154,2.13; 155,19.20; 158,15;  
160,3-11; 163,19.28; 164,7; 166,5
- anti**, meaning, 140,23.27; 154,24;  
174,16; in place of ,105,4.21; 107,10  
stand for, 106,12; 149,14; 165,22;  
168,25; in lieu of ,143,17
- antidiastellein**, contrast, 90,7
- antikeimenon**, contrary, 113,23;  
114,5; 124,10.16.18; 159,8; 185,6;  
what is antithetical, 120,15.28;  
158,6; opposite, 132,26.27; 189,25;  
contrasting, 112,24; 113,24.29;  
116,15; 119,20.21; 120,6;  
antithesis, 120,8.9
- antikeitai**, is the contrary, 117,18; is  
antithetical, 117,19; 122,9; 124,22;  
159,9; contrasted, 116,9
- antiphasis**, contradiction, 170,9.10;  
172,15; 181,3.4
- antithesis**, antithesis, 122,11;  
128,5.24.32; 129,25; 130,2; 131,8;  
135,7
- aoristos**, indeterminate, 104,5; 114,2;  
117,17; 122,6; 161,2;  
indeterminacy, 122,11; indefinite,  
92,30.31; 93,9; 135,15; undefined,  
188,25
- apathês**, impassible, 167,12
- apeiria**, inexperience, 169,16; 170,7;  
174,18; lack of experience, 170,22
- apeiron**, infinite, 96,12.17.18;  
100,18.21; 101,4.27.29; 106,9.18;  
128,9; 134,23; infinitely,  
100,4.28.32; 101,9; 105,12; 106,9;  
*ad infinitum*, 94,10; 98,14-27;  
102,14-26; 103,3-18; 104,1; 106,9;  
191,6; indefinitely, 97,4; 99,32;  
100,11.13.16.28; 103,13; unlimited,  
101,30.31; infinity, 102,4
- aphaireisthai**, be taken from,  
100,2.3.24; be taken away, 158,2;  
be removed, 100,9; 105,5; be  
subtracted, 105,8.13; 106,2; have  
things subtracted from one, 105,5;  
*aphairoumenon*, subtraction, 105,11
- aphairesis**, subtraction, 156,21.31;  
157,25; 158,1; (a process of)  
elimination, 162,6.10.13.18; 163,1;  
166,22
- aphanizesthai**, disappear, 164,14
- aphistêmi, aphestêkota**, to be at a  
remove, 125,4.5
- aphthartos**, imperishable, 168,13;  
189,10.12.27; 190,19; 191,4.7.9;  
192,18; indestructible, 188,18
- apoballein**, discard, 115,4; 161,27;  
183,17; 184,2.5.6; 190,12

- apobolê**, loss, 132,17, discarding, 183,17; 184,5
- apodeiknunai**, demonstrate, 136,7
- apodeiktikos**, demonstrative, 151,15
- apodidonai**, deliver, 135,17; 192,3.6; give, 139,22.24; 163,18; 170,25; 172,30; 173,32; 182,9.12.13.21; 186,28; 190,19; present, 169,5.6.8
- apoion**, quality-less, 139,19; 156,14
- apolambanein**, receive, 128,28.29
- apologia**, defence, 186,28
- apomimêma**, replica, 146,20
- apophainesthai**, **apophainomenos**, presentation, 96,24
- apophasis**, negation, 114,31; 120,2; *ex apophaseôs*, apophatically, 192,5
- apophatikôs**, by negation, 120,9
- apoplêroun**, occupy, 166,17; satisfy, 136,19
- aporein**, to encounter an impasse, 143,29
- aporia**, puzzle, 130,32; 138,17; 140,19; 141,7; 150,22.23; 165,12; 170,25.28; 171,21; 172,25.30; 173,31; 175,5; difficulty, 98,13; 169,8.11.12; 181,15.21.26; 182,3.6.11; impasse, 81,24; problem, 39,6
- apostasis**, remove, 125,4
- apotelein**, make up, 159,11; *apotelesthai*, be completed, 157,4; *apoteloumena*, outcomes, 116,28
- apotelesma**, outcome, 186,19
- apoxeô**, chisel off, 156,32
- apsukhos**, inanimate, 101,25; 114,27; 115,15; 129,26; 130,3; lifeless, 191,25
- arithmêtos**, countable, 160,23.24.31; 161,1; 163,27.29; 164,12.15.24; 167,6.8
- arithmôî hen**, **arithmôî mia**, numerically one, 154,23; 163,25; 164,24; 168,7
- arkhaioteroi**, earlier thinkers, 139,8
- arkhê**, principle, 86,25; 87,11; 90,16; 91,10-28 *passim*; 92,21; 95,4; 96,11-22 *passim*; 101,28; 102,5-10 *passim*; 104,5; 108,11-109,27 *passim*; 110,2-111,6 *passim*; 112,4; 115,18; 116,19; 117,10.23.24.25; 118,5.11; 121,19.27; 122,1-123,21 *passim*; 124,12; 125,10-28 *passim*; 126,2.24; 127,20-128,21 *passim*; 129,10.12; 130,24; 133,3-29 *passim*; 134,1-135,16 *passim*; 136,7-32 *passim*; 137,3-18 *passim*; 138,5-32 *passim*; 139,2.4.5.7; 140,11-28 *passim*; 141,2-24 *passim*; 142,1-143,6 *passim*; 144,14.18; 148,20.22.24.26; 150,10.18.23; 151,2.4.8; 152,4-15 *passim*; 155,14; 159,15.19.20; 160,19.22; 161,6-33 *passim*; 163,15.20.27; 164,3.4.6.7; 165,9-21 *passim*; 166,1.10.19; 167,5-168,26 *passim*; 169,9; 170,25.26; 171,10; 172,26.27.30; 173,32; 182,26; 183,2; 184,12; 186,6; 192,24; 193,3-12 *passim*; beginning, 99,33; 141,14; 148,21; 151,16; 154,7; 169,27; origin, 88,31; 137,1; source, 187,7.9; 189,16; start, 94,2
- arkhoeidestera**, origin-like, 109,6; 137,2
- artaô**, **êrtêtai**, depend, 193,1
- askhêmatistos**, unstructured, 114,8; shapeless, 120,25; 190,7; shapelessness, 120,27
- asômaton**, incorporeal, 90,16
- astronomia**, astronomy, 96,20
- asunkritos**, incomparable, 163,8
- asunthesia**, non-composition, 113,11.12.18.21; 114,2.4; 115,19; 116,2.6.7.8; 120,4-30
- asuntheton**, non-composition, 116,10
- asustatos**, incoherent, 143,9
- atelôs**, not to the full, 170,10
- atomon**, individual, 120,31
- atomos**, uncuttable, 98,31.32; atomic, 97,23 individual, 99,13.20
- atomos**, *hê*, atom, 95,14; 110,8.13; 116,22.29; 117,2.6; 129,19
- atopon**, absurd, 171,18; 172,8; 175,20; 189,20; 191,6; absurdity, 169,28; 170,23; 174,26.27
- authupostatton**, self-supporting, 160,13.29; self-subsistent, 136,14; 137,14; 138,2.8.9.10.11.12; 164,27.28; 168,17
- auxanô**, grow, 96,28; 97,7.8; 102,15-28 *passim*; 134,24; 155,27; 156,27.29.31; 157,24; increase, 97,4; 174,25.26
- axiôma**, axiom, 89,16; 96,27; 99,26; 100,15; 105,2; 111,8.12; 191,9.11; order of merit, 174,15; law, 181,3; *koinon aksiôma*, common axiom, 89,16

**axiopiastia**, authority, 90,11

**bapheis**, dyers, 114,14

**baru**, heavy, 92,7,9

**deiknumi**, prove, 132,19; show, 86,23; 96,10; 108,18; 109,17; 110,25; 111,6,7; 112,7; 115,17; 118,11; 127,21,23; 132,3; 133,17; 136,13; 143,26; 144,23; 152,14; 154,7; 184,18; 189,10,12; 190,19,20,29; 191,9; provide a demonstration, 156,17; demonstrate, 33,7; 99,10,31; 100,7; 127,23; 132,31; 137,9; 143,2,3; 158,30; indicate, 121,24; 135,12,18; reveal, 163,21

**deixis**, demonstration, 108,21

**dekakis**, ten times, 99,28

**dekapêkhuaion**, ten cubit, 99,28

**dekhomai**, receive, 93,7,10,11; 128,34; 129,25; 138,26; 161,28; 162,27; 182,18; 183,32; 184,2; 186,21,22; take on, 93,1,2; 115,5; 162,28; 174,2,3; 177,11; admit, 158,7; 159,4; get, 191,27

**dêlon**, clear, 88,29; 89,10; 91,3; 97,6; 100,9; 103,11; 109,7; 113,6,10,15,21; 115,22; 118,15; 119,29; 120,13; 121,21; 129,5; 130,25; 131,25; 132,12,24; 134,14; 135,9; 137,24; 138,26; 141,2; 150,24; 151,20; 154,19; 157,28; 158,4; 159,15; 161,6,14,21,29; 165,14,23; 170,29,31; 171,12; 177,17; 179,23; 180,22; 183,25,31; 185,19; 187,7; 188,17; 189,11,13,22; 191,16; evident, 96,21; 102,8; 128,12; plain, 125,10

**dêmiourgia**, creation, 191,15,24

**dêpou**, surely, 110,18; 129,5; then surely, 159,20; 174,4,7; 183,32; obviously, 179,7; still, 120,13; 183,8,14; presumably, 161,16; therefore, 191,16

**dexomenon, to**, receptacle, 140,29

**diairesis**, classification, 89,10,11; 108,22; 109,29; 170,8,11,13; binary classification, 143,5; division, 93,10; 98,25,29; 104,11-24 *passim*; 123,12; 135,25; 136,3; distinction, 127,5; 182,5; dichotomy, 127,25,28

**diakrinai** separate, 87,15,16,17; 95,17,19; pick apart, 101,6,12;

106,20,22,23,25; 107,1; discriminate, 94,7; 148,2; divide, 136,26; disperse, 140,8; distinguish, 153,12-25 *passim*; 154,6; 182,24; 187,3; disintegrate, 88,10

**diakrisis**, separation, 94,29 (and *passim*); 95,12,14; 123,12; 124,11,20,21,23,25; 125,3; decomposition, 110,11; division, 124,17; discrimination, 148,1; 187,3; distinction, 148,12,18; 153,11,20; 154,26; 164,2

**dialegomai**, discuss, 90,9; 192,29; 193,5; talk (about), 152,3

**dialektikê**, dialectic, 169,16; 174,18; dialectical, 170,7

**dialuein**, break down, 160,4,7

**diapherein**, differ, 94,5; 107,22; 113,6; 116,30; 117,5; 122,30,31; 137,23; 185,22; 192,12; be different, 120,22; 129,16

**diaphônein**, disagree, 142,14

**diaphora**, differentia, 92,25; 130,8,12,16,19; 139,17; difference, 94,11; 116,25,28; 125,23; 151,13; 173,20; 183,7; 185,24; variation, 116,24; what is different, 122,27

**diaphoros, diaphoron**, diverse, 93,3; different, 101,7,10; distinct, 101,8; various, 103,28; 115,13; different (things), 186,5

**diastellein, diasteilasthai**, determine, 144,23; 177,4 draw the distinction, 183,24; distinguish, 185,17; chart, 174,19

**diathesis**, disposition, 112,24; 113,24,30

**didaskalia**, exposition, 151,16

**didaskein**, convey, 151,14; inform, 122,26; instruct, 96,22

**didonai**, give, 87,18; 184,13; grant, 142,26

**dikhôs**, in twofold ways, 176,20,25,27; 177,3

**dikhotomein**, halve, 100,6

**diôrismenon**, discrete, 130,34; 131,3

**diorizein**, mark off, 183,24; define, 192,28; carry out an analysis, 154,8

**dittôs**, in two ways, 104,9; 175,6

**dogma**, view, 125,21

**doxa**, opinion, 87,9; 94,20; 110,2; 116,19; 122,8-28 *passim*; 126,1; thought, 86,21; position, 89,1; view,

- 89,7; 108,13.15.17; 169,20;  
174,29.30; theory, 91,9; 96,4; belief,  
184,25; doctrine, 185,4
- dunamis**, potential, potentiality,  
106,15; 170,28; 172,31-173,30  
*passim*; 181,15-25 *passim*; 182,4;  
192,17.18.19; capacity, 131,12-32  
*passim*; 163,11; 169,21.23.24
- eidenai**, to know, 92,29; 193,1; *isteon*,  
have to be aware, 124,1; 162,4;  
worth noting, 147,6
- eidikos**, **eidikê**, formal, 110,18;  
127,25; 133,25; 134,1, 167,26
- eidikôtaton**, most specific, 130,27
- eidopoiein**, to format, 171,27; 188,25;  
190,4; to give form to, 116,21.23;  
140,3; be formative, 121,19; endue  
with form, 112,14; *eidopepoiëmenon*  
with its form intact, 157,19, already  
formatted, 173,18; 174,10; 182,14;  
formalised, 122,6
- eidopoios**, form-giving, 91,18.23;  
92,25; 115,18; 142,11; 189,8
- eidos**, form, 102,2.5; 104,21;  
129,16.21; 136,19; 148,4; 153,21;  
154,23.24.25; 158,5.6; 159,9;  
163,13; 164,21; 166,6; 183,19.20;  
185,29; 186,12.24; 187,24.26;  
188,20; 192,25; species, 129,16;  
130,20; 150,11; 192,12
- eidei**, formally, 163,13.25; 164,21
- eikotôs**, reasonably enough, 166,15;  
plausible, 98,7; 110,27; 117,22;  
192,3; reasonable, 109,10; 133,9;  
make sense, 145,12
- eilikrinôs**, purely, 87,17; thoroughly,  
106,27
- einai**, to exist, 106,16; to be, 191,27  
and *passim*; see also *on*, *onta* and  
*ousia*
- eisballein**, embark, 89,4; 90,4
- ekdiaphorêsis**, dissipation, 157,2
- êkhos**, sound, 116,15
- ekkrinein**, **ekkrinesthai**, separate  
off, 87,2; separate out, 87,3;  
88,17.28; 89,32; 90,23; 91,2; 93,17;  
extract / be extracted, 87,31.33;  
93,23-9 *passim*; 94,2.9;  
95,3.6.15.19; 100,11.18; 105,14-22  
*passim*; be expelled, 88,22
- ekkrisis**, extraction, 87,8.9.27.30;  
94,4.22.26; 95,2; 99,32;  
100,11.13.17.29; separation, 169,26
- ekphainesthai**, manifesting  
themselves, 88,22
- ekphansis**, manifestation, 88,29;  
95,20
- ekteinomenos**, stretched, 132,10
- ektithenai**, explain, 154,27
- ektrepein**, take a wrong turning,  
168,19; 174,17.19
- elegkhein**, **elegxai**, criticise,  
86,21.22; refute, 109,10.27; 138,20;  
examine, 181,15; argue, 109,13
- elegkhos**, criticism, 89,3.4; 90,4; 96,7
- elephas**, elephant, 104,3
- emphainô**, imply, 145,16.18.34
- emprosthen**, front, 117,10; earlier,  
144,12; 167,23; 185,12; 193,3;  
above, 128,4
- empasukhon**, animate, 101,24; 114,27;  
115,14; 129,6; 130,2
- enantia**, contraries, 89,28.29.30;  
91,6-32 *passim*; 92,2-27 *passim*;  
93,25; 95,23.24; 96,6; 107,17;  
109,21-111,27 *passim*; 112,1-27  
*passim*; 113,26.30; 114,28;  
117,1.22; 118,2-27 *passim*;  
119,8.10.25.26.28; 121,2.16-27  
*passim*; 122,1.2.4.6.19.21; 123,1.31;  
125,17.22; 126,16.19; 127,20.31;  
128,1; 133,19; 134,13-23 *passim*;  
135,5.18; 136,4.7.12-32 *passim*;  
137,3-15 *passim*; 138,32; 140,1-25  
*passim*; 141,2-20 *passim*;  
142,11.24; 143,26-32 *passim*;  
149,17; 151,1; 155,16.17.24; 157,30;  
161,29-34; 162,1; 165,6-21 *passim*;  
183,21; 187,31.32; 188,1.4
- enantios**, opposite, 92,5; contrary,  
109,18; 112,13; 116,28.30; 117,5;  
118,3; 141,1; 166,15; 189,6.21;  
opposed, 133,29; 148,4; 187,22.24  
*tounantion*, on the contrary,  
111,26; 118,4; 138,11; 142,2
- enantiósis**, contrariety, 87,13;  
91,19-24; 110,27; 112,17;  
114,19.20.33; 115,5.10; 116,24.31;  
122,28; 124,3.17; 125,7; 126,18;  
127,4.22; 128,9.12.13.18.21.22;  
129,4.8.13.24; 130,4.23.29.31;  
131,5.11; 132,11-33 *passim*;  
134,26.29.31; 135,6.10.11.20.22.26;  
136,2.3.8.10; 139,13; 142,5;  
143,1-20 *passim*; 144,4.6.12.13;  
148,28; 149,3-15 *passim*; 150,1-16  
*passim*; 157,28; 164,15

- enantiotês**, opposition, 93,13.17.23;  
contrariety, 87,3; 90,1.23; 91,2;  
113,28; 114,9.18; 115,2; 116,9; 117,9;  
141,13; 165,11; conflict, 161,35
- enargeia**, what is obvious, 170,23;  
what is self evident, 78,10; clear  
and distinct, 111,20; actual, 172,31
- energeia**, activity, 163,4.5.11.12
- kat'energeian**, actual, 88,16; 90,17;  
106,12
- enargôs**, plainly, 156,9.10
- enkalein**, lay a charge against, 96,2
- enkosmios**, within the cosmos, 163,7
- ennoia**, notion, 142,10; 182,15.16;  
184,25.27; intuition, 94,18 ; 96,4;  
122,14; idea, 89,4; 162,24.28; 163,2;  
thinking, 136,1; outlook, 144,15  
*koinê ennoia*, common intuition,  
111,8; common sense, 117,25;  
118,12
- enteles**, complete, 149,6
- entheôrein**, discern, 116,9
- entrepikon**, *reductio*, 96,8.25; 101,30
- enuparkhein**, subsist within, 87,2.7;  
89,32; 93,18; 95,4.6.8; inhere,  
159,16; 173,32; include, 87,22; be  
present in, 88,15.17.18; be inside,  
88,20; be (with)in, 89,20; 104,9.14;  
178,5; exist (with)in,  
106,8.13.16.17.18; indwell, 99,3; be  
incorporated, 101,2; reside in,  
178,8 *enuparkhon*, as a  
constituent, 190,22.25.26.27
- epakolouthēin**, accrue to, 157,9;  
follow, 140,19
- eperkhesthai**, go through, 158,30;  
embark, 151,25
- ephetos**, sought after, 187,21;  
188,2.22.23
- ephiesthai**, seek, 187,26-32 *passim*;  
188,1-8 *passim*; yearn, 138,6
- ephodion**, advantageous, 151,10
- epiballein**, achieve, 162,3; hit upon,  
162,9; put one's finger on, 162,31
- epiblêtikôs**, directly, 192,4
- epibolê**, act, 163,10
- epienai**, arrive, 145,4; approach,  
148,3.6.10; 181,11; onset, 159,10,  
182,25
- epigignesthai**, supervene, 92,28;  
97,27; 103,23.25.26; 113,20; 115,7;  
116,12; 129,29; 146,23;  
191,12.15.16; impinge, 148,17;  
develop, 130,10; arrive, 153,21
- epikheirêma**, argument, 140,17.18;  
150,5; 189,12.17; 192,1; objection,  
96,7.11.25.26; 99,32; 100,22.28;  
101,29; 104,31; 105,2.26; attempt,  
133,17
- epiluesthai**, resolve, 96,2; 169,8.11;  
170,24.28; 172,25.30; 173,31; 175,5;  
181,22; solve, 161,35
- epilusis**, resolution, 173,31
- epinoein**, consider, 97,6; conceive,  
138,22; 165,1; think, 146,27
- epiphaneia**, surface, 128,12.14.17;  
157,12.13.14
- epipherein**, go on to say, 185,24
- episêmeioutai**, points out, 91,8;  
*episêmeiôteon*, it is worth pointing  
out, 90,7
- episkopêsai**, review, 170,13
- epistatousê**, presiding, 98,35; 99,5.6
- epistêmê**, understanding,  
122,8.15.16; science,  
96,11.15.16.20.21; 128,4;  
131,19.30.33; knowledge, 122,3.5.7;  
130,28
- epistêmôn**, expert, 96,10.23.24; one  
with understanding, 122,9
- epistêmonikôs**, scientifically, 169,5
- episumbainon**, consequence, 174,26
- epiteleîn**, perfect, 115,13
- erion**, wool, 132,10
- eulogon**, plausible, 98,1.8; 102,28;  
183,21; logical, 103,29; reasonable,  
161,31; *eulogôs*, logically, 103,24
- eusunopton**, easy to see, 156,6
- eutrepistheis**, prepared, 116,3
- exaireisthai**, be separate, 186,18;  
*exêirêmenon*, far removed, 151,22;  
transcendent, 193,2
- exakontizesthai**, pop out, 88,22
- exallattomai**, vary, 156,25
- exartaô**, *exêrtetai*, depend, 189,16
- exêgêtai**, exegetes, 129,15;  
commentators, 133,4
- existasthai**, get out of the way,  
153,20; shun, 185,28
- exitêlos**, attenuated, 97,9
- gegônîômenos/a/on**, angular,  
116,29.30; 132,6; angled, 116,31;  
with angles, 132,4
- gêina**, earthy things, 86,32
- genesis**, coming-to-be, 146,12;  
181,15.22; 187,5.15; development,  
86,32; 87,5; 91,15.25; 92,17;



- 94,22.25; 107,16; 108,2; 111,5;  
112,3.9.24; 113,30; 114,6.32;  
115,16; 118,8.15; 120,17.23; 121,20;  
132,26; 151,7.19.24.26; 152,1.15;  
153,23; 156,19; 157,30; 158,24;  
165,8; 180,21.23; developing,  
157,7.8.9; origin, 112,23; 156,9;  
188,12; creation, 87,29; 128,34;  
becoming, 176,13; coming into  
being, 146,12.13; 169,25
- genêta**, things subject to  
development, 182,2; things that  
develop, 152,6
- genikôtatos**, most general, 99,11;  
150,8
- gennaô**, produce, 86,28; 87,5.8; 89,20;  
90,19.21; 91,1.7.13.22; 93,16; 95,12;  
135,14; generate, 101,26; 108,8;  
110,6; 149,21.23; 150,1; beget,  
89,18; 93,4; give rise to, 92,26;  
143,21.22; 161,34; bring about,  
148,30
- geômetria**, geometry, 96,20
- gignomai**, become, 87,6; 89,30; 93,7;  
97,25; 100,25; 106,2; 112,2; 118,20;  
144,29; 152,20.21.23; 176,10; occur,  
86,32; come into existence, 87,13;  
come into being, 89,8; 191,34; come  
to be, 187,16; be created, 144,32;  
develop, 95,5; 101,18; 107,13;  
112,20; 113,22; 114,23; 119,6;  
120,15.24.25; 121,2.16; 130,9;  
144,28; 151,9; 152,4.7.12; 153,1-27  
*passim*; 154,1-15 *passim*;  
156,18-157,30 *passim*; come,  
118,14; 152,17.19.24.28.29;  
170,9-171,5 *passim*; arise, 111,14;  
112,28; 113,8.10.12.32; 114,3;  
emerge, 94,4; 130,23; 131,33; come  
(from), 94,21 and *passim*; 95,30;  
101,21; 111,21; 115,23; 118,14;  
120,14; give rise to, 111,11; take  
place, 132,17; 135,5; derive from,  
143,30
- gignôskein, ginôskein, gnônai**,  
comprehend, 102,6.9; know, 128,6;  
162,31; get to know, 162,8
- ginomenon, ginomena**, developing  
thing, 151,9; 152,5; 153,1.2.4.7;  
154,15; thing that develops, 107,17;  
112,12; 118,13; 152,13.29, what  
develops / has developed, 94,21;  
152,26; derivative things, 88,31
- gluku**, sweet, 111,10.13.16.17; 135,27
- gnôrimon**, accessible, 122,32;  
123,2.4.6.8.11; 124,14.17; 125,8.24;  
126,6.7; 127,3-16 *passim*; 151,22
- gnôrimôteron**, more knowable,  
123,16.19; more accessible, 125,24;  
126,6; 127,9; more familiar, 151,22
- gnôsis**, knowledge, 96,15.16;  
128,5.6.26; 130,29; 151,12.13;  
162,3.5.9.19; 166,21; 184,11.13;  
192,5; knowing, 130,30
- goun**, at any rate, 160,13; 183,13
- grammatikê**, grammar, 131,25
- grammê**, line, 111,10; 157,13
- gumnazei**, explores, 119,27; 120,21
- haplôs**, simpliciter, 89,12; 151,24.26;  
152,3.10; 158,10; 170,15.18.29.30;  
171,1.2.4.30; 180,6;  
184,20.22.26.27.29; 185,4.7.8.18.20;  
without the qualifications, 100,30;  
*tout court*, 96,1 absolutely, 87,20;  
156,13; straightforwardly, 92,16;  
125,14; 163,16; simply, 99,29;  
108,3; 110,26; 113,31.34; 114,20.28;  
115,9.22.29; 121,1; 122,8.13; 137,26;  
145,11; 147,6; 158,13.14; 178,17;  
179,15; 180,2.3 simple, 113,34;  
(quite) generally, 111,25.29; 113,22;  
127,25; 158,27; 188,15.16;  
universally, 112,16; purely, 193,7;  
directly, 96,10; just ... as such,  
150,24; once and for all, 110,25
- haplous**, simple, 94,15; 103,27.29;  
112,10.17.20.28.29.30; 113,20.27;  
119,19.21.25; 152,19.20.22.26.29;  
153,5.7.8.22; 157,16; 170,18; 193,9
- harmonia**, harmony, 112,29;  
113,10.13.14.18.20; 120,3.4.6.21.22;  
tuning, 113,28.29; 191,21.22; mode,  
116,11.12.16
- hekatontakis**, one hundred times,  
99,29
- hekatontapêkhuaïos**, one hundred  
cubit, 99,27
- hekatontapêkhus**, a hundred cubits,  
97,4
- hêmisphairion**, hemisphere, 129,2
- henopoïoun**, unifying, 92,31
- hepomenon**, consequence, 189,20;  
conclusion, 105,1
- heterotês**, otherness, 185,14;  
difference, 170,2
- himas**, elastic, 132,10
- hippos**, horse, 99,16.20; 107,7.13.14;

- 113,10; 114,21.23.25.29; 115,29;  
120,10.11.14; 131,24; 144,1.2 and  
*passim*  
**hoi amphi**, the school of, 86,21  
**hoi palaioteroi**, earlier thinkers,  
124,11; 142,17; ancient thinkers,  
184,11  
**holotés**, whole, 99,8; as a whole,  
159,22  
**homoimerê, homoimereia**,  
uniform parts, 93,28; 94,1.13.19.25;  
95,15.16; 96,12; 97,17.23;  
99,1.18.33; 100,1.12.29.30.32.35;  
101,7.9.10; 102,16-104,2 *passim*;  
106,7.17; 110,13; 113,3; 157,8;  
uniform, 98,19.21; 99,7; 104,29  
**homoiotés**, resemblance, 146,31;  
similarity, 123,27; 162,18; likeness,  
162,17  
**homónumos**, homonymous, 152,1;  
170,14.16  
**homónumós**, in the same sense, 132,2  
**homoousios**, of the same substance,  
156,28  
**horismos**, definition, 123,28;  
132,24-6; 160,9; 163,18; 180,24;  
190,19; 192,3.6.7.10.14.15  
**horistikos, horistikon**, definitive,  
92,31; definitional, 154,25  
**horos**, definition, 93,9; 160,10;  
163,30; 188,26.30; 190,28; limit,  
96,29  
**hugron**, the moist, moisture,  
156,10.29; wet, 89,29; 112,15.18;  
113,27; 119,22; 123,5; 125,27.28;  
131,7.14; 134,31; 135,1.3.4;  
139,20.22; 149,13.22; *hugroteros*,  
wetter, 115,10  
**hulê**, matter, 91,4.6.10.18; 92,24-31  
*passim*; 93,6-12 *passim*; 94,16;  
97,25.26; 104,19.21.22; 106,13.15;  
107,19; 109,24; 110,16-111,4  
*passim*; 114,25.26; 115,20-116,20  
*passim*; 130,9-14; 131,2;  
134,2.5.6.7; 136,11; 137,21.23.25;  
138,3-139,24 *passim*; 140,20;  
142,4-18 *passim*; 144,18-145,32  
*passim*; 146,2-25 *passim*; 147,13-34  
*passim*; 148,1-24 *passim*; 149,16;  
150,17.20; 153,12-25 *passim*;  
154,6-155,5 *passim*; 157,15-17;  
158,7.8; 159,3.6; 160,17-161,23  
*passim*; 162,3-30 *passim*;  
163,27-164,29 *passim*; 165,6.16;  
166,1-26 *passim*; 167,1-23 *passim*;  
168,6-169,1 *passim*; 171,6-20  
*passim*; 172,7-24 *passim*;  
173,3.15-174,4 *passim*; 175,29;  
176,3; 178,6-10 *passim*; 181,8.11;  
182,9-28 *passim*; 183,1-30 *passim*;  
184,17-185,28 *passim*; 186,3-22  
*passim*; 187,26-188,28 *passim*;  
189,1-26 *passim*; 190,2-33 *passim*;  
191,1.2.3.7.9.27.30.33.34; 192,3-12  
*passim*; 193,10.12; material, 91,25;  
140,2; 180,11.17.18  
**huparkhein**, exist, 95,2; 96,30;  
100,20; 103,29; 106,14; 138,25.27;  
150,20; 160,29; 173,4; 179,14; be,  
87,19; 104,6; 149,8; be  
(understood), 98,11; be there,  
179,17.22; there is / was, 98,2;  
119,3; subsist, 97,10; 139,3; 173,18;  
belong, 111,2; 128,14.16.17;  
130,20.31; 133,7; 165,24; 179,10;  
188,24; apply, 104,21; 110,28.32;  
116,13; 117,22; 118,2.13; 131,16;  
get (status), 167,8  
**huparxis, en huparxei**, real, 97,6;  
existence, 97,16; 132,12; 137,26;  
138,4.7; 161,19; 174,31; 191,27  
**huperekhein**, transcends, 163,7.8  
**huperokhê**, transcendence, 163,8;  
excess, 91,20.26.29.30; 92,1.3.6.14;  
123,11; 124,9.18; 127,13; 131,2.3;  
142,12.13  
**hupertithetai**, refers, 168,11; 192,29  
**hupexistamai**, yield, 148,4.5; 153,21;  
158,6; 166,5; 188,20; clear off,  
178,28  
**huphistêmi, huphestêke**,  
**huphestêkota**, subsist, 96,28;  
104,20; 134,22; 164,28; 173,16;  
have subsistence, 163,30;  
subsistent entities, 134,22; come to  
exist, 104,11; exist, 130,19  
**hupobathra**, base, 186,23  
**hupodokhê**, receiving, 97,26;  
reception, 167,18  
**hupographê**, description, 192,14.15  
**hupokeimai**, underlie, 88,31; 98,2.5;  
118,5; 129,22.24; 130,22; 137,6;  
154,15; 159,10; 162,7; 166,26;  
167,1.2; 174,22.23.24; 179,9;  
186,10; is a substrate for,  
130,15.30; 185,27; *hupokeimenon*,  
substrate, 89,26; 90,16; 91,7.13;  
92,6.24.25.26; 101,14; 102,1.3;



- 103,24; 107,9.10; 109,29; 112,13.19;  
119,16.17; 120,2.7; 123,25.27;  
128,35; 129,16.18.20.30;  
130,10.15.17.30; 131,1; 135,23;  
136,20-33 *passim*;  
137,1.3-6.14.20.28;  
138,4.17.18.19.24.27.31;  
139,7.11.13; 140,11-27 *passim*;  
141,14-17; 142,24-144,6 *passim*;  
145,9; 147,4; 148,28-149,11 *passim*;  
150,16; 152,12; 153,2; 155,16-26  
*passim*; 156,5-19 *passim*;  
157,19.23.29; 158,5-30 *passim*;  
159,2-19 *passim*; 160,14; 162,1.15;  
163,13-25 *passim*; 164,20; 165,15;  
166,11.25; 167,21; 169,1; 171,25;  
172,1.7; 174,11; 180,5; 182,21.23;  
183,3-25 *passim*; 189,17.19.22;  
191,23-31 *passim*; underlying,  
90,30; 91,4.21; 93,15; 97,29; 109,25;  
110,20; 115,24; 129,21; 136,11.19;  
149,16; 150,20; underlying subject,  
173,13; underlying substrate,  
92,13; underlying element, 115,26;  
what underlies, 97,30; 138,26;  
141,4; 191,21
- hupokhôrein**, give way to, 177,12;  
make way for, 181,11, concede its  
place to, 185,29
- hupolambanein**, take, 94,24;  
183,24.26; suppose, 94,30
- hupomenein**, endure, 139,19;  
145,4.5.6.33.34; 146,3.7.8.28;  
147,5.14.15.16.19.22.26; 148,3-16  
*passim*; 153,20.21; 154,1.14.18;  
158,7; 159,10; survive, 157,20;  
164,13; 177,9.10; 180,7; 182,25;  
abide, 111,28; remain, 139,20;  
141,11; undergo, 95,19
- huponoein**, think, 95,22; understand,  
154,24
- en hupostasei**, real, 119,17
- hypothesis**, hypothesis, 100,13;  
108,28; 109,10; 134,24; 144,5;  
178,15; 189,20.23; thesis, 96,5.10;  
103,21.33; 105,1
- hupotithenai**, to suggest, 88,4;  
91,23; 92,20; 94,24; 108,16.18;  
125,22; 128,7; 129,19; 139,11;  
162,4, 166,21; 182,14; 189,22; to  
posit, 86,3.25.29; 87,14; 90,18;  
91,10; 95,11; 110,7.8; 116,20.24.27;  
117,11; 125,14.19; 139,17.18;  
140,2.12.19; 142,4.5.16; 186,7.11;
- to propose, 87,12; 91,4.6; 108,10;  
143,20; to suppose, 91,15; 102,3;  
177,16; position, 86,23; hypothesis,  
101,28; consider the hypothesis,  
149,3
- husteron**, posterior, 133,15; 150,11;  
later, 109,16; 117,3.5
- iatreuein**, practise medicine, 173,8-9;  
175,8-9; 177,7
- iatros**, doctor, 173,8-14; 175,8-18;  
176,21.24; 177,4.6
- idiazousa**, individuating, 121,1
- idikos**, individual, 133,14; particular,  
120,6
- idios, idia, idion**, proper; own,  
113,23-4; 120,16; 132,12; 160,29;  
165,2; 173,17; characteristic,  
110,31; individual, 114,10.11;  
120,5; 133,14; own particular,  
116,8; *idiôs*, individually, 151,12
- isosthenês**, equipollent, 110,23
- kakopoios, kakopoion**, maleficent,  
186,26; 187,2.4.11.12.19
- kalein**, designate, 145,29; call,  
87,20.22.24; 88,1.6.9; 92,30;  
93,8.10; 95,28; 99,14; 110,3.9.10;  
113,9; 115,3; 116,22; 117,11; 120,6;  
125,17.26; 129,18; 137,25.26;  
148,22.24; 151,2; 183,1; 184,24;  
so-called, 94,14; put it, 119,1;  
identify (by name, by terms),  
120,4; 132,30; use terms, 120,5;  
138,8; 158,11; apply terms,  
184,26; refer to (with such and  
such terms), 145, 20; name,  
120,10; say, 144,14.16
- kallion**, more elegant, 101,26; 108,9;  
135,15.16; 150,17
- kallos**, beauty, 188,26
- kalos, kalon**, beautiful, 187,27.28; *ou  
kalôs*, in an unsatisfactory way,  
107,18; *kalôs*, well, 128,30; 130,7;  
159,21; 169,5; 170,7; 180,8; 186,12;  
well-chosen, 186,18
- kampê**, caterpillar, 180,19-20.24
- kampulon**, curved, 117,16-17
- kampulotês**, curviness, 122,12
- katalegein**, stop, 98,24
- katalogos**, list, 139,7
- katamênion**, menses, 114,25; 115,3;  
145,1.34; 146,3; 148,10; 157,20;  
158,2; 175,30

- kataphanai**, assert, 192,7; say something positively, 162,9
- kataphaskein**, purport to assert, 192,8,10
- kataphatikos**, assertive, 192,6
- kataskeuastikos**, support, 164,21
- kataskeuazein**, establish, 102,15,16, 125,19; set up, 116,2; 191,20; give a justification, 187,19
- katégorein**, to predicate, 183,1; *katégoreisthai*, be predicated, 99,15-23; 129,16,32; 130,18,26; 133,2; 140,30; 170,17; 179,13; 183,7; 192,12
- katégoria**, predication, 99,14; category, 128,15; 129,11; 132,12,16,18; 133,4,6,8; 137,2; 155,25; 156,4,7; 176,11; 185,27; *Hai Katégoriai, The Categories*, 137,28; 174,4,9
- to katégoroumenon**, what is predicated, 140,29
- kathapax**, once and for all, 112,18
- katharos**, pure, 100,12
- kath' hauton, kath' hautên, kath' hautô, kath' hauta**, in itself, in themselves, 93,2; 150,18; 165,2, 173,16 and *passim*; *per se*, 154,20,21; 160,2; 161,2-17; 164,4-6; 168,5,26; 170,26-7; 171,7-173,25; 174,20; 175,6-19; 176,21-7; 177,22; 178,3-21; 179,28-182,3; 185,10-11; 189,1,5,19; 190,1-28; 192,17-18; 193,12; by itself, 167,22; *auto kath' hautô, autê kath' hautên*, itself in itself, 107,5; in itself, 167,12; *autai kath' heautas*, themselves in themselves, 165,11; *auta kath' hauta*, by / in themselves, 109,23; 161,32; all by themselves, 136,28
- kathistêmi**, make, 87,6
- katholikôtatos, katholikôtatê**, most generic, 122,20,24; 125,10, 128,11,22; 132,13; 134,14,20; 150,7; *ta katholikôtata*, the most generic things, 130,14
- katholikôteron**, more general, 91,19; more generic, 122,32; 123,3-20; 125,1-23; 126,17; 127,5-17; 166,24; more inclusive, 176,8,15
- katholou**, universal, 91,3; 132,23; 151,22; 164,7; universally, 128,6; in general, 112,30; 122,10; 127,28; 161,7; 162,6; generic, 123,23; *ta katholou*, universals, 151,13,21
- kenon**, void, 110,8; empty, 110,9-11; 116,22-3,26
- kharaktêristikon**, characteristic, 138,15
- kharaktêrizesthai**, be characterised, 112,17; 137,22; 168,21
- khôra**, location, 112,33; place, 166,17
- khordê**, string, 113,34; 116,11-15; 191,20-2
- khoregia**, resources, 186,23
- khôrion**, space, 149,17
- khôris**, in isolation, 138,25; apart, 149,2,8; without, 173,4; separately, 186,2
- khôriston**, separate, 192,24; separated, 193,2
- khôrisein**, isolate, 101,14,15,16; 106,10-28; 107,1,7; 160,26; remove, 184,7; separate, 186,3
- khreia**, need, 158,28; needs, 97,16; 155,14; contribution, 140,11
- khreizein**, crave, 138,7
- khresimeuei**, is useful, 91,9
- khresis**, usage, 144,25,26; 146,32; 148,1; 153,13,18; 182,24; quotation, 125,28
- khresthai**, use, 89,9; 144,6,8; 145,7,25; 147,7; 162,21; 166,23; 176,4; 180,19; invite, 90,24; need, 156,31; employ, 170,11
- khutos**, can be melted, 156,10
- kinêsis**, motion, 92,6
- kinêtheis**, motivated, 89,5
- kinoumenon**, moving, 92,4; engaged (in motion), 92,5; moved, 110,27
- kirnamena**, mix, 156,12
- klinê**, bed, 157,3,4; 162,25; 163,29
- koinônein**, have in common, 122,30
- koinônia**, kinship, 109,4,6; 125,22
- koinos, koinê**, common, 88,30; 89,7,16,26; 120,4; 125,9; 130,20,22; 132,29; 133,13; 134,7,14; 144,26; 150,12; 169,20; 170,16; 187,7; in common, 112,13; 122,27; shared, 113,25; 115,29; 184,25; general, 13,21; 14,4-16,25; 19,18-19,27; *kata koinou*, taken in common, 90,6; 140,6; *koinê ennoia*, common sense, 117,23; 118,12; common intuition, 111,8
- koinôs**, generally, 91,24; 127,26;

- 158,28; in common, 112,6;  
commonly, 120,1
- koinotatos, koinotatê**, most general,  
134,9; 169,10; maximally general,  
134,26; 135,7.11.20 most common,  
150,12 most universal, 99,12;  
122,1.18; 127,22; most widely  
shared, 125,13; 126,23; 129,10;  
130,1.6; 132,33
- koinoteron**, more general, 91,26;  
158,27; more generally, 95,18;  
more inclusively, 176,13; more  
common, 133,11.15
- kôlueîn**, prevent, 191,30
- kônôps**, gnat, 104,4
- koruphai**, points, 117,6-8
- kosmein**, to order, 137,7; put into  
good order, 187,28; arrange,  
168,19.20; 169,1; 188,29
- kosmêthênai**, organisation, 165,3
- kosmos**, world, 88,9.11; 97,5; 189,16
- kouphos**, light, 92,8-10
- krasis**, mixture, 97,29; 98,1; 103,23;  
112,30; 113,9; 131,8-28; 191,12-23
- kruptein**, hide, 87,26; conceal, 87,30
- lambanein**, take, 91,18; 118,18;  
122,14; 129,20; 131,24; 132,21;  
134,17; 143,4.17; 155,18; and  
*passim*; acquire, 92,8; adopt, 99,26;  
107,16; choose, 122,31-123,30;  
125,1-12.23-5; 126,12.19.20.23-6;  
make a choice, 126,23; take up,  
116,14; take on, 161,27; draw,  
126,11.14.16.18; use, 127,3; get,  
98,20; 130,5.6; 174,8; deal with,  
174,11; consider, 97,6; suppose,  
95,29
- legein**, say, 88,6.25.29.32; 89,2;  
90,5.6.29; 91,2 and *passim*; speak,  
104,24; 129,32; call, 114,29; name,  
126,7; mean, 92,27; 97,31 and  
*passim*; claim, 99,1; hold, 103,22;  
that is, 105,17; 112,17; i.e. 94,13;  
114,21; that is to say, 115,26; *viz.*,  
122,16; namely, 122,21; indeed,  
115,15; to the effect that, 109,11
- leukainesthai**, turn white, 156,1;  
turn grey, 175,14.15.17
- leukos, leukon**, white, 89,29; 90,3;  
92,1.11-14; 107,5-8;  
111,13.17.32.33; 114,14; 118,20.22;  
119,3-10; 121,15; 123,9; 124,5.7;  
128,20; 129,23; 140,30;  
145,18.19.21; 148,5-7; 150,9;  
176,14; 190,15; light, 135,27; pale,  
158,14; whiteness, 190,15
- lexis**, text, 90,28.29; 149,6; linguistic  
usage, 175,27; *epi lexêôs*, explicitly,  
184,8
- litharion**, stonelet, 88,2
- lithos**, block, 145,30.31; 146,21.27.29;  
157,4.26; stone, 87,33; 88,2; 99,4;  
103,2.4; 113,3.10; 114,4.22.23.26;  
115,26; 120,12.14; 121,8; 156,32;  
157,1.25
- logikos, logikê, logikon**, rational,  
124,6.7; 129,26-8; 130,2.31;  
131,17.29
- logismos**, reasoning, 162,30
- logôî**, conceptually, 144,23;  
154,12.16.17; 159,9; 163,17; 164,23;  
168,6-7; 182,24; 183,3-26; 184,9;  
185,22-3; 186,13.14; *kata ton logon*,  
conceptually, 163,18
- logos**, specification, 93,2.5; 146,7;  
154,22.25.26; 160,4-5.7.29; 165,2;  
167,24-168,1; 173,17; definition,  
134,15; 136,9.13.19; 138,30; 139,22;  
140,11; 188,28; 189,3-4; 190,14;  
description, 123,26.28; role,  
130,12.14; 131,2; relation,  
162,21-2; argument, 90,10; 97,1.21;  
100,18; 102,25; 103,12.20;  
108,25.27; 109,10.24.30; 118,12;  
119,27; 120,21; 121,28; 138,29.31;  
143,17; 149,10; 152,9; 169,5-13;  
170,8.24.25; 171,3; 173,32; 184,18;  
discussion, 90,11; 115,20.22.30;  
127,23; 129,9; 133,24; 134,1.2;  
136,12; 138,1; 139,5; 152,8; 160,23;  
172,26; 176,9; 191,8; 192,1.29; topic  
of discussion, 179,4; claim, 138,32;  
passage, 137,22; book, 193,5; work,  
193,8; reasoning, 91,21; 97,2;  
109,33; 111,7; 115,17; 125,19;  
account, 92,16; 139,24; 166,11.19;  
172,30; rational formula, 96,17;  
proportion, 112,19; 113,15;  
rationale, 116,25; reason, 123,1-19;  
124,14; 125,8.24-5; 126,6; 127,4-16;  
144,4; analysis, 154,9;  
182,9.12.13.21; 184,17; 186,12;  
what is said, 147,24; text, 151,25;  
*logos*, 168,2
- Ludios**, Lydian, 113,13-33; 116,11.16
- lueîn**, resolve, 165,12; 181,26;  
182,3.5.10; solve, 172,29

- lura*, lyre, 122,22; 191,20
- malakos*, soft, 114,15
- manon*, rare, 116,19; 123,5.10.15.22; 131,5; 149,13
- manoô*, *manoumenon*, *manôtheis*, rarefied, 88,16; 90,20; 92,8; 132,7; thinned, 86,29
- manôsis*, rarefaction, 86,28; 87,4; 92,21.26; 110,5.7; 132,8.9
- manoteron*, more spread, out, 92,12
- manotês*, rarity, 90,21; 91,1-22; 93,16; 95,12; 116,20; 127,11.14; 131,6-132,11; 135,8; 136,23; 140,3
- manthanein*, discover, 97,24
- matên*, in vain, 143,23; 193,3; pointless, 160,12
- mathêmata*, *hoi apo tôn mathêmatôn*, the mathematically trained, 98,13
- mêdamêi mêdamôs on*, *to*, absolute and utter non-being, 89,7-8; 94,21.30; 95,29-30; 107,19; 184,24; 185,13; 190,30; 191,10.16.28.30; what in no way and no sense is, 161,9; 169,24; 173,2.29; 181,19-20
- megethos*, magnitude, 98,14.22.23.27.28.33; 99,25; 100,5.20.34.35; 101,10; 105,7.13.20; 128,18; 131,4; size, 96,28; 97,3.5.7.8.10.12.21; 98,6.9; 102,14; 103,9.10.16; 104,5; 105,21.23; largeness, 97,16.19; 102,12; quantity, 99,35; 100,1.7.8.19
- meiôsis*, reduction in size, 97,10; shrinkage, 102,26; 103,30
- meiousthai*, shrink, 96,29; 102,15-29; 103,3-13; be reduced, 157,2; be reduced in size, 103,14; get smaller, 156,29; *meiôthenai*, be reduced, 103,11.18
- meizôn*, greater, 92,2.6.10; 96,29; 99,27.30; 101,19; 102,23; 104,6; larger, 92,8; 97,20; 103,31; 131,4; 132,7; increased size, 100,23; 102,14; relatively large, 103,5
- melas*, black, 89,29; 92,1-15; 107,6; 111,13-17.32-3; 114,14; 118,20-2; 119,3-9; 121,15; 123,9; 124,5; 126,20.21; 128,19; 129,13; 150,9; dark, 135,27; 175,16
- meli*, honey, 106,28
- melissa*, bee, 107,14; 179,6; 180,9
- mellein*, is going to, 91,9; would, 116,26; is to, 154,11
- menein*, remain, 160,27; 167,18; 177,9; last, 133,19.22.32; 134,2.16; 193,3; survive, 157,19; *meinan*, left behind, 93,4; staying there, 180,22
- merikon*, particular, 123,8.23; 132,23; 151,23; 167,7; 171,20; *merikôteron*, more particular, 122,31; 123,4.7.12.17.20; 125,1.9.11.24; 126,17.24; 127,6.7.10.16; 151,12; 163,4; 190,24; *merikôtaton*, most particular, 99,14
- meros*, part, 98,19.31.35; 99,9; 102,19.20; 104,9.10; 148,17; 154,19; 171,10.11.18.29; 172,19.22; 178,26; 180,5; 185,26; 186,20; *ana meros*, in turn / in turns, 88,7; 109,25; 122,23; 129,2.22; 136,27; 148,29; 155,17; by turns, 128,33; 153,15; for distinct aspects, 144,30; 153,15; severally, 155,5; *kata meros*, severally, 158,31; bit by bit, 138,25; particular, 146,29; 159,22-3; 191,33; particular types, 151,26
- metaballein*, to change, 88,15; 92,8.9; 95,2.4; 112,3; 115,8.25.27; 118,17; 119,15.21; 121,28; 122,2.18.19.20.22; 128,26; 131,12.15; 135,1.8; 136,16.29; 141,10; 143,25.32.33; 144,1.2; 146,8.15.25; 148,14; 155,18-29; 156,1.4.6.23.24.27; 157,18-32; 167,17; 174,8; 179,8; 180,21; to be altered, 145,33; turn into, 178,24
- metabolê*, change, 111,4.5; 112,10.12.21; 113,27; 118,8; 119,23.26; 121,29; 122,1.23.24; 128,32; 129,9; 134,3-135,11; 141,11; 143,25.27.32; 146,15.17; 147,4; 153,3; 155,22; 156,5.8.15.30; 157,23; 176,11.13.14; motion, 129,1 case of change, 148,3
- metaikhmion*, disputed territory, 149,17
- metalambanein*, partake, 163,10.12; 188,10; *metalêpsis*, taking on, 183,16; 184,4
- metaskhêmatistsis*, change of shape, 156,20.22
- metaskhêmatizein*, change shape, 157,23
- metaxu*, intermediate, 86,27; 87,1.7;

- 88,31; 93,18; 95,1,3; 114,14,15;  
139,11,14; 142,4,18; 149,8,16;  
182,15; between, 88,26; 101,3;  
119,6,7; in between, 90,18;  
121,12,14,16,17
- metekhein**, participate, 99,13; have a share of, 119,8,10; 121,17; partake, 128,15; 145,11,12; 187,8,12; share in, 187,27; 189,2
- meteôra**, atmospheric phenomena, 193,6
- methodos**, method, 112,26; 170,7,22
- mimeisthai**, mimic, 146,11,13;  
147,25; imitate, 147,2
- monakhôs**, uniquely, 122,11
- monas**, monad, 93,10; 123,7,13,18
- monos**, just, 152,6; only, 120,2
- morion**, arm / limb (of classification), 89,11; 149,14; part, 99,17,21;  
102,11,16,17,22,28;  
104,7,10,14,17,25; 112,33; 121,6,11;  
128,16; 132,8,9; 156,26; 157,5;  
piece, 98,33; 99,2; bit, 157,1; sector, 129,3
- morphê**, shape, 114,7,10,33; 182,19;  
form, 132,2,8; 152,12; 163,15;  
figure, 156,24
- morphousthai**, be shaped, 114,8
- mousikê**, music, 131,18; musicality, 163,28; musical education, 166,5
- mousikos, mousikon**, musical, 111,13,16; 118,24,25; 144,28;  
145,16,20,21; 147,22; 148,5,6;  
152,21-6,28; 153,1,27; 154,1;  
155,20,21; 158,15; 160,3-13;  
musical person, 118,23; 144,27;  
147,21; musician, 152,27; 153,14,15
- noein**, understand, 141,5
- noêton**, intelligible, 88,8; 185,13
- nothos**, bastard, 162,30
- nous**, intellect, 87,14; 101,5,11,15,17;  
106,21; 107,1; sense, 104,17; mind, 162,10
- oikia**, house, 99,5; 101,20; 103,2,3;  
107,27,28; 108,6; 113,2,11;  
114,2,4,30; 120,23,29,30,31;  
121,6,8; 145,30,31; 146,22,26,29;  
147,10,11; 157,3,26; *ouk oikia*, non-house, 114,29; 147,10,11
- oikodomein**, do construction work, 173,10-14; 175,8,10,11
- oikodomos**, construction worker, 173,11,12,14; 175,11; house builder, 114,3
- oikonomia**, structure, 109,31
- oikos**, house, 88,32; 89,1
- oinomeli**, mead, 106,27
- oinos**, wine, 106,28; 190,15
- on, to on**, being, 89,12; 133,5; 137,26; 152,1; 169,17 and *passim*; entity; 160,22-161,5; *ti on*, some entity, 89,8; *onta*, entities, 99,25; 109,34; 124,1; 132,23; 140,17,22; realities, 109,3; reality, 121,19; things that are, 89,9; things that exist, 116,24; 187,4; things, 93,1; 96,14; 126,24 and *passim*; see also *einai* and *ousia*
- onoma**, name, 113,24,25; 120,11,16; 132,30; 153,10,26; 182,28; word, 120,7; 186,8; term, 120,4; 186,5; *onomati*, by name, 132,29; nominal, 183,5; *ta onomata*, linguistic expression, 160,18
- onomazein**, to name, 95,26; 120,1,9,11; 145,9; to give names, 120,7; to designate, 147,19,21; to put it, 111,31; *mê onomasthai*, there being no name for, 112,24; 113,29; lack names, 119,19,29; 120,16; *mê onomasmenai*, not named, 114,19
- opisthen**, back, 117,10
- organikon**, organic, 157,8
- ouranios, ta ourania**, heavenly bodies, 128,25; 129,1; 152,7; 159,22; 166,9,10; astronomical things, 128,32; celestial things, 133,23,25
- ouranos**, universe, 189,16
- ousia**, substance, 112,8-28; 113,19; 119,16-27; 128,20-7; 129,4-130,5; 130,22; 132,18,20; 133,3-10; 136,2,31,32; 137,1-138,28; 140,13,17,20,30; 141,1-142,2; 144,13; 146,8; 150,6; 155,24; 156,6; 158,10-24,27; 159,24; 162,2,28; 166,23,24,25,26; 167,1; 168,12; 170,17,19; 185,25-8; 190,6,9; essence, 162,32; 180,24; 192,4,8,12; reality, 191,27; being, 191,31; *mallon ousia*, more substantial, 168,16-22; *kat' ousian*, substantial, 112,21; 146,31,33; 147,25; 151,19; 155,9,18,22,23; 176,17; in respect of substance, 119,15; 145,32;



- 146,2-20; 156,6; 157,18.27.32;  
158,12.16; 176,13  
**ousiôdês**, substantial, 114,18; 146,4;  
156,15  
**ousiôdôs**, substantially, 115,8  
**ousiôtai**, is substantial, 140,21;  
141,1.8.9.13
- panspermia**, universal seed,  
87,21.26.31; 95,27; 106,15  
**pantôs**, invariably, 92,8; 98,24;  
101,22.31; 103,6.9.30; 107,16.23;  
112,3; 187,13 and *passim*;  
universally, 95,29; 103,26; 105,13;  
always, 97,21; 100,6  
**paradeigma**, illustration, 93,25;  
155,17; example, 153,3; 166,3;  
175,7; 176,23; 179,2; 180,19  
**paradeigmatikon**, paradigmatic  
(cause), 186,19  
**parakolouthounta**, adjuncts,  
151,18; 152,2  
**paralambanein**, employ, 172,26;  
adopt, 134,23; include, 136,9.14;  
incorporate, 166,19; take, 98,4;  
assume, 134,15  
**parathesis**, juxtaposition, 113,7  
**paratithenai**, add, 125,28  
**parousia**, presence, 122,23; 133,30;  
161,34; 165,16; 168,20; arrival,  
164,14; 186,24; 189,28  
**pas**, all, 91,20; 93,28 and *passim*;  
*panta*, all things, 86,24; 106,15 and  
*passim*; everything, 87,15.19.20;  
88,1.27; 89,5; 97,7; 116,18 and  
*passim*; *to pan*, the universe, 87,13  
**paskhein**, be acted on, 98,7;  
109,19-26; 111,10; 115,7;  
136,17.30; 142,16.18; 148,29;  
155,15; 156,15; 157,30; 161,33;  
165,9.10; 176,21-5; 177,6-7; be  
affected, 98,10-12; 111,9;  
115,10.12; 161,30; 175,13;  
176,7-16; the effect on, 88,20; the  
passive role, 139,2  
**pathêsis**, case of being affected,  
176,12  
**pathêtikos**, passible, 167,10; passive,  
142,15; 189,7.8; that are acted  
upon, 133,29; *pathêtikai poiôtêtes*,  
affective qualities, 115,1;  
131,6.14.22.23.27.32  
**pathos**, effect, 98,11; 131,7; 139,19;  
165,13; affection, 106,25.29; 107,8  
**peithein**, persuade, 89,27; 166,3;  
*peithesthai*, believe, 96,24;  
persuasion, 125,20  
**pêkhuaion**, one cubit, 97,3.13; 99,28  
**pentapêkhus**, five cubits, 97,3  
**peperasmenon**, finite, 96,18;  
99,26.27.29; 100,16-25; 101,26.28;  
105,3-20; 106,3; 108,7-10.17.19;  
109,8.28; 127,27.29; 129,6;  
134,18.24; 135,12.14.16.18; finite  
quantity, 100,2; finitely many,  
109,14.17; finite in number,  
127,25; 133,20; 134,17.20; limited,  
99,35; 100,1; 102,5  
**periekhô**, encompass, 91,20.27;  
101,3; 126,15.19.21; 134,13.19.20;  
contain, 88,27; 89,1; comprise,  
128,9  
**periektikos**, encompassing, 126,22;  
(something that) encompasses,  
124,25; 150,17; inclusive, 125,23  
**periektikôteros**, more  
all-encompassing, 126,22  
**periergos**, otiose, 149,18.24  
**perilambanein**, encompass, 130,1;  
131,4; encapsulate, 96,17  
**periorizein**, offer definitions, 96,16;  
define, 96,18  
**periphantazesthai**, have an inkling  
of, 91,11  
**periphrês**, round, 117,15  
**peripiptein**, fall into, 181,4  
**perittos**, surplus to requirements,  
143,22.23.30; 150,1; otiose, 109,29;  
odd, 123,6.13.18; 124,7.15; 126,5.8;  
128,19; pointless, 180,13;  
*perittômatikon*, residue, 158,3  
**phaios**, grey, 119,6.7.9; 121,14  
**phainesthai**, be apparent, 95,25; be  
seen, 171,21; appear, 182,26;  
183,25; 185,17  
**phaneron**, apparent, 152,10  
**phêmi**, affirm, 115,15; 191,29; claim,  
101,25; say, 86,23; 88,24; 95,14;  
130,3; 148,19.20.25 and *passim*;  
declare, 115,31; mention, 145,11; I  
mean, 131,19; 140,1; 160,8; *viz.*,  
170,24; my view is, 119,23; 138,20;  
147,28; 152,7; my reply is, 130,5; I  
would say, 126,18; 130,33; my  
claim is, 145,8; my answer is,  
145,31; is my view, 164,11  
**pherô**, deploy, 146,33; take, 167,15;  
apply, 120,12; 144,26.29; 145,13;

- 175,28; 176,2; bring, 169,7.11.12;  
181,15; bring out, 171,22;  
*sumphonôs pheresthai*, to go along  
with, 125,16
- phônê**, term, 152,1; 170,14.16;  
expression, 145,10-28; *phônai*,  
dialect, 117,11
- phthartikos**, destructive, 89,30;  
95,24; 110,20; 111,26; 118,4; 187,32
- phthartos**, subject to decay, 128,24;  
182,2; perishable, 168,13; 193,5;  
destructible, 188,19
- phtheirein**, **phtheiresthai**, destroy /  
be destroyed, 95,14; 98,26.29.32;  
103,18; 104,11.21; 160,27; 187,17;  
188,11.17; decay, 111,15-18.21.22;  
112,20.23; 118,13.14.16; 120,8;  
121,2; 151,18; 152,7.14; 159,23;  
180,11.20; 183,17; 184,4; 188,12.13;  
190,28-191,8; perish, 111,33; 112,2;  
189,9-190,28; pass away, 113,17;  
191,34 disintegrate, 115,27;  
*phtheirousa*, destructive, 187,16
- phthora**, decay, 92,17; 109,20.26;  
110,12; 112,4.6; 115,17; 118,15;  
120,18; 132,27; 142,20; 156,12;  
157,29; 165,8.14.17; 166,18; 187,5;  
destruction, 95,18; 123,26.28.31;  
187,32; 188,1.2; passing away,  
121,18.21-3; 155,25
- phylattein**, look after, 186,21.22;  
retain, 115,18
- phuô**, **pephuke**, be inclined, 96,17; be  
naturally fitted, 115,7; 131,28;  
162,27; be such by nature, 136,22;  
139,3; 189,5; in their nature to,  
103,25; 161,10; be in themselves  
such, 161,32; be such, 103,13.14.19;  
106,29; 111,9.33; 165,12; be  
naturally capable, 174,2.3; be  
natural, 174,4.5; naturally,  
96,27-9; 113,21; 114,32
- phusikon**, natural, 106,30; 146,22;  
156,12; 163,6; 173,3; 193,4.7;  
physical, 193,6; *phusika*, physical  
things, 90,10; 109,7; natural  
things, 101,23; 113,2.5.6; 152,3.6;  
156,11; 157,6; 159,18.20; 160,23;  
166,9.10.12; natural cases, 113,8;  
natural objects, 116,1; natural  
entities, 122,22; *phusika pragmata*,  
natural things, 87,28; 108,23-8;  
127,20; 128,2; 129,10.11; 134,10;  
135,19; physical objects,  
169,6.10.12; 182,1.10; natural  
objects, 193,8.9; *meta ta phusika*,  
*Metaphysics*, 168,11; 181,24; 192,30
- phusikos**, **phusikoi**, natural  
philosopher(s), 86,22.24; 89,7;  
90,5-29; 91,2-24; 94,20.30; 108,15;  
142,17; 169,20; 184,25; physicist,  
192,26
- phusis**, nature, 96,9.13; 98,35; 99,3.7;  
106,26; 110,26; 114,6; 130,20;  
133,15; 135,15; 137,1.2.12;  
138,13.21.27; 140,28; 142,1.2;  
143,23; 144,25; 147,2; 149,8.16;  
152,11; 153,19; 157,7.32; 158,1;  
159,15; 160,18; 162,25; 165,13;  
169,7; 170,16; 174,14.16.17;  
182,2.3.20; 185,8; 186,11.13;  
190,5.31; 192,20; *phusei*, naturally,  
93,1; 112,4; 172,12; natural, 157,1;  
*kata phusin*, natural, 151,11.24
- pistousthai**, back up, 139,6; confirm,  
179,2; be confirmed, 109,32;  
158,22; 160,6
- planê**, error, 89,11.14; stray, 120,16
- plêthos**, plurality, 169,27;  
170,1.2.5.24; 174,27.30; 175,1;  
177,22; *plêthei*, in number, 100,34
- poiein**, create, 114,14; 186,24; act,  
109,20.22; 111,9.10; 136,30; 139,3;  
155,15; 176,21 and *passim*; make,  
86,30-1; 87,3.26.27; 88,2.3;  
90,15-30; 91,21; 92,21.28; 93,15;  
96,18; 98,18.34; 99,2;  
114,4.11.14.20; 115,10; 135,26;  
139,8; 142,18 and *passim*; make  
up, 102,30; bring about, 87,15;  
109,26; 142,17.19 and *passim*; do,  
87,18; 94,7.9; 108,7.21; 109,16;  
122,25; 135,17; 136,25 and *passim*;  
form, 88,8.10; 103,32; fashion,  
97,13.14; effect, 109,19; 122,24;  
132,25; 133,30 and *passim*; produce,  
112,30; offer, 102,25; construct,  
152,8; draw, 127,5; *poioun*, agent,  
98,8.12; what acts, 109,23; active  
role, 139,2; creative, 187,16
- poiêsis**, case of doing, 176,12
- poiêtikon**, that act upon, 133,29;  
efficient, 110,18.22; 148,26;  
productive, 111,3; 118,3; 139,5;  
active, 142,14; 189,7; *poiêtikon*  
*aition*, efficient cause, 87,14; 88,6;  
107,22; 111,23; 133,24; 179,5 and  
*passim*



- poikilós**, at random, 114,1; in intricate ways, 167,17.19
- poion**, quality, 98,1.3; 101,6; 119,7; 131,5 and *passim*; kind, 101,30.31; 102,7
- poiotés**, quality, 93,6; 97,13; 98,10; 103,29; 112,12; 114,12.18; 115,12; 131,9.15.17.23; 132,1.33; 133,1 and *passim*; *pathêtikai* *poiôtêtes*, affective qualities, 115,1; 131,6-32
- pollakhôs**, in many senses, 107,10; in a number of ways, 136,21; in manifold ways, 175,21; *pollakhôs legesthai*, to have a number of meanings, 155,11; 158,9
- pollakhou**, in many places, 129,17; all over the place, 144,7
- pollakis**, frequently, 89,23; 137,25; many times, 94,8; often, 158,11; 167,25
- pollaplasion**, many multiples, 134,18
- polloî, polla**, several, 90,27; 109,4.13; 127,29 and *passim*; many, 91,5; 94,1; 133,26 and *passim*; plural, 109,28; a number of, 103,1; the majority, 114,5; more than one, 149,12; *dia pollôn*, at length, 136,7
- polugônôteron**, more polygonal, 132,4
- polukhôrêtoteron**, having greater volume, 132,4.5
- polukoïranîê**, proliferation of rulers, 193,1
- poluónumos**, having several names, 183,6
- polus, pollê, polu**, huge, 97,7.9; 185,23; much, 103,16.18; *epi polu*, excessively, 103,14; considerable, 116,24; great, 146,31; 150,23
- poluthrulêtos**, frequently mentioned, 88,5
- poson**, quantity, 93,7.11.12; 96,27; 97,16; 98,2.3.5; 100,22; and *passim*; number, 101,30.31; 102,7; how many, 102,6.10
- posotês**, quantity, 98,1
- posoutai**, is quantified, 93,7
- pragma, pragmata**, thing, 87,28; 90,12; 99,11; 101,12 and *passim*; 153,11; object, 96,12.17; 130,17.21; 154,19; 160,13; 161,19.20.24; 182,1.5; and *passim*; subject, 169,6.7; items, 186,7.8; matters, 90,8; facts, 96,9
- pragmateia**, treatise, 193,6; work, 151,17
- pragmateiôdês**, factual, 96,25.26; 99,32
- pragmatikê**, real, 153,19
- proagein**, develop, 170,8
- prodêlos, prodêlon**, quite evident, 112,6; obvious, 148,17; 153,27; 158,21; noticeable, 174,7
- proêgeisthai**, precede, 130,8; 151,12; come first, 130,13
- prokeisthai**, to be the present task, 110,25; to be a project, 108,20; to be engaged in, 130,21; *prokeimenos, prokeimenê, prokeimenon*, the case before us, 177,5; current, 151,10; under discussion, 151,17; the task, 127,21; the immediate task, 109,31
- prokheirizomai**, undertake, 135,21; test, 143,15; examine, 152,13
- prolambanein**, adopt, 96,26
- proodos**, procession, 99,11
- prophanes**, obvious, 112,22; 126,9; 155,26; evident, 158,16
- prophanôs**, evidently, 119,25; clearly, 131,10; plainly, 131,12
- pros ti**, relative, 158,17.18; relation, 128,2
- prosagoreuein**, designate, 153,26 refer, 145,24
- prosêkei**, is fitting, 145,27; *prosêkon*, appropriate, 116,14; 145,13
- prosekhês**, proximate, 115,2; 145,32.33; 146,2; 147,26; 148,13.16; 150,9.10; 172,3.14.20; elementary, 178,23; *prosekhesteros*, more proximate, 130,11; 132,15; *prosekhestatos*, primary, 93,11; directly proximate, 115,20; most proximate, 115,30; 116,15
- prosekhôs**, just now, 151,4; just, 163,14; immediately, 114,23; proximately, 114,26; 120,27; directly, 136,3; *prosekhôs einai*, be proximate, 115,21.28; 132,33
- proslêpsis**, acquisition, 132,17
- prosôpon**, pretence, 96,10; character, 90,11
- prosrhêma**, terminology, 144,26.29; 145,7-35; 147,7.28; 176,4
- prostheîsis**, appendage, 108,2
- prostithenai**, add, 144,11

- prosupakoueîn**, understand, 90,5;  
understand in addition, 149,6.9
- protasis**, premiss, 166,14; 185,1
- proteron**, prior, 133,19; 134,13;  
136,33; 137,2.12; 138,11.12.18 and  
*passim*; first, 107,5; 109,16; 111,7  
and *passim*; former, 136,15;  
138,19; 164,22; formerly, 112,2;  
119,4; before, 119,3; 189,22;  
191,15; previously, 155,27; 156,2.3;  
180,20; earlier, 161,27; 177,13
- prôtistos**, very first, 110,28; 135,11;  
primary, most primary, 127,21;  
128,12.18.21; 129,4 and *passim*
- protithenai**, propose, 151,16; 160,18
- prôtos**, prime (matter), 145,32;  
146,3.9; 148,13.16; 172,14; 191,7.8;  
initial, 89,22; primary, 110,32;  
115,25; 118,2, 159,20 and *passim*;  
first, 89,26 and *passim*; firstly,  
128,3; 133,27
- prôtôs**, in a primary way, 111,2; in  
the first place, 159,18.19;  
principally, 128,14; primarily,  
128,17; 133,5.21
- proupokeisthai**, pre-underlie,  
140,28; 189,23; 191,5.17.27.29.32;  
pre-exist, 122,17; 169,19
- pseudês**, false, 90,11
- psimmuthion**, lead paint, 107,7
- psukhê**, soul, 128,25.27.32;  
131,18.19.26.29.33; 132,1; 162,10;  
191,13.18.19.25; *Peri psukhês*, *De Anima*, 128,30
- psukhesthai**, cool down, 131,15; get  
cold, 139,19
- psukhikos**, psychological, 131,32
- psukhron**, cold, 89,28.31; 90,3;  
110,2.3.4.5; 111,14.24.25; 112,2  
and *passim*
- ptênon**, winged thing, 180,20.25
- puknon**, dense, 116,20;  
123,5.10.15.22; 131,6; 149,13
- puknôsis**, condensation, 86,28; 87,4;  
92,21.26; 110,5.7; condensing, 88,19
- puknotês**, density, 90,21;  
91,1.7.8.13.14.22; 93,16; 95,12;  
116,21; 127,11.15; 131,7-132,6;  
135,8; 136,23; 140,3
- puknoun**, compress, 86,30.31; 88,18;  
condense, 88,18; 90,20; 132,7; press  
together, 88,21
- rhêton**, saying, 175,27; statement,  
141,5
- saphes**, clear, 151,20; plain, 183,29;  
191,34; clarity, 143,17; 152,13
- saphesteron**, clearer, 93,24; 97,2;  
more evident, 151,21; 152,7; (to  
clarify) further, 87,8
- sarkion**, blastocyst, 157,34; fleshlet,  
88,2; 103,34.35; 104,4; 105,8.17;  
flesh portion, 100,3.14; flesh-bits,  
100,18; (bit) of flesh, 98,16.18
- sarx**, flesh, 89,20; 100,30.33; 105,16  
and *passim*
- sêmainein**, indicate, 126,16; 133,15;  
148,21; designate, 137,27; signify,  
145,12; 153,11; 170,18; mean,  
134,3; 164,16; 177,18.19; 180,4;  
183,6; 184,19; 185,2; refer / have a  
reference, 186,4-5; identify, 132,29
- sêmainomenon**, sense, 129,17;  
137,18.19.24; meaning, 177,4.13.15
- sêmantikos**, signify, 170,11; refer to,  
183,11; 186,5.9
- sêmeiôô**, to take note, 148,19
- skhêma**, structure, 113,12;  
114,7.9.11.17.32; shape, 116,29;  
117,11.12; 132,2.3.6; 156,24.25;
- skhêmatizein**, to shape, 120,25;  
142,8; 158,1; 190,7; to structure,  
114,8
- skôlêx**, maggot, 89,24; 115,30;  
180,19-20.24.29
- sôizein**, preserve / be preserved,  
99,7.8; 103,14; 104,22; 185,8;  
retain, 103,20; remain, 104,15;  
survive, 157,23; hang on to, 188,9
- sôma**, body, 88,12; 89,31,  
90,3.17.19.30 and *passim*; bodily  
element, 131,28-9; solid,  
157,11.12.13; *en sômati genomenê*,  
embodied, 131,19
- sômatia**, bits, 89,32
- sôreia**, accumulation, 87,26; heaping  
up, 113,1.7
- sôreuein**, heap together, 99,3
- sôros**, heap, 87,21.22.30; 112,33
- sostikos**, preserving, 110,21
- sperma**, sperm, 114,24; 144,32;  
145,1.30.34; 146,2.26.28; 148,9;  
157,20.33; 158,2; 175,30.31; 180,1  
semen, 115,3.10.28; seed, 87,22;  
93,3.5; 106,16; 107,21; 146,6; 156,9;  
184,12; 186,21; egg, 180,29

- sphairikos**, spherical, 117,2.3; 132,5.6  
**sphairoeidēs**, sphere-shaped, 117,4  
**sphairos**, *sphairos*, 88,9.10;  
 94,2.9.10; 95,7.9.10  
**sphêx**, wasp, 107,14; 115,30;  
 179,5-9.19; 180,9  
**sterēsis**, privation, 91,32; 113,25.31  
 and *passim*  
**stoikheiodēs**, elemental, 151,8  
**stoikheion**, element, 86,28.29; 87,2.5;  
 88,5-32; 90,17.19; 92,20; 93,19.27;  
 94,2-16; 95,4-14; 97,27.31; 103,23;  
 104,24.25; 108,20.25; 110,4.6.17;  
 112,12.21; 115,27; 119,22; 131,11;  
 134,30.32; 135,7; 139,9; 142,5.6;  
 148,19-25; 149,22; 151,5; 154,8-21;  
 156,11.13; 157,7.16.33; 159,22;  
 182,14; 191,13  
**sugkhōrein**, assent, 138,19; concede,  
 183,9; agree, 184,18.21; be in  
 agreement, 185,1; go along with,  
 191,11  
**sunkeisthai**, be put together, 102,10;  
 be composed, 102,19; 104,4; 152,25;  
 159,17.24; 160,3.6; be made of,  
 103,4.7; be combined, 157,11; be a  
 combination, 157,12; *sunkeimenon*,  
 made up, 87,16; composed, 100,35  
**sunkekhumenon**, indiscriminate,  
 133,11-14  
**sunkrinesthai**, combine, 88,8; be  
 gathered, 94,10; collect, 95,16.19  
**sunkrisis**, collection, 94,28; 95,12.13;  
 123,12; 124,11.20.21.24.26; 125,3;  
 composition, 110,11; combination,  
 88,13; 169,26; comparison, 164,9  
**sunkritikon**, absorbent, 92,14.15  
**sullegein**, assemble, 133,16  
**sullogismos**, argument, 89,9; 102,17;  
 inference, 133,21; syllogism,  
 140,15.16.24; 151,13-15; 166,14  
**sullogizesthai**, deduce, 154,9  
**sumbainein**, the result is, 87,5;  
 happen, 89,26; 112,23; 118,23.25;  
 141,12; 171,24; 173,11.23.26;  
 178,25; 189,4; turn out, 134,23;  
 175,2; turn out to be the case,  
 172,13; it so happens, 171,13;  
 175,10.16; accidentally happen,  
 189,4; *sumbainon*, consequence,  
 174,25; *sumbebēke*, follows, 99,11;  
 happened, 118,21; 171,26; 179,10;  
 is an accident of, 164,6; is  
 accidental, 164,15; 178,11; see also  
*sumbebēkos*  
**sumballesthai**, be engaged, 144,21;  
 collaborate, 161,20.25; contribute,  
 150,20; 153,23; 158,3; 171,14  
**sumbebēkos**, *sumbebēkota*,  
 attributes, 101,13.15; 112,5.21;  
 118,16; 140,22-142,1; 158,12.21;  
 166,26; 167,1; accidents, 137,10-12;  
 138,13; *kata sumbebēkos*, *per*  
*accidens*, 118,19.20.21.23; 154,21;  
 159,23 and *passim*; in respect of  
 attribute, 119,14.24; 146,15.17;  
 151,20; 158,13; incidentally, 150,19  
**sumbolikós**, symbolic, 92,29  
**summeiousthai**, shrink along with,  
 102,31; 103,30  
**sumpatheia**, interaction, 113,8  
**sumperainein**, derive, 105,2;  
*sumperainesthai*, sum up, 152,9.10  
**sumperasma**, conclusion, 166,14  
**sumphónos**, in accord, 122,29; 136,1;  
 consistent, 133,10; 147,24; in  
 keeping, 165,7  
**sumphónōs**, in concert, 125,21;  
*sumphónōs pheresthai*, to go along  
 with, 125,16  
**sumplekesthai**, entwine, be  
 entwined, 161,10.11;  
*sumplekomenai*, embracing each  
 other, 149,21  
**sumplêrein**, complete, 159,16; 164,3;  
 comprise, 162,2, component, 163,20  
**sumplêrótikos**, that together make  
 up, 161,24  
**sunagein**, draw (the conclusion),  
 105,1; conclude, 95,25; 163,26;  
 gather, 136,26; gather together,  
 140,6.7.8; *sunagesthai*, the  
 inference comes out, 172,8; gather,  
 88,8; *sunagomena*, collected  
 together, 88,2  
**sunairein**, *sunelon*, draw together,  
 147,28; take together, 153,24;  
 compress, 144,18  
**sunaiasthanesthai**, be aware, 125,11  
**sunaition**, *sunaitia*, auxiliary cause,  
 186,16.18.19  
**sunanairein**, *sunanaireitai*,  
 co-destroy, co-destroyed, 137,12.13;  
 138,13.14.22  
**sunanalambanein**, include with,  
 145,10.15.23; 147,14

- sunanaphainetai**, simultaneously emerges, 135,19
- sundromê**, concurrence, 103,22
- sunēinai**, be simultaneous, 130,8.13.16.19; come together, 109,22
- sunēispherein**, contribute, 161,18
- sunekheia**, continuity, 109,30
- sunekhes**, continuous, 93,15; 128,15; 130,34; 131,4; 141,5; 164,20; 178,17; continuum, 105,12
- sunekhesthai**, be enclosed, 88,17
- sunēmmenon**, reasoning, 102,24; 103,33; antecedent, 133,23; 134,12; *sunēmmenōs*, in a connected way, 140,15
- sunemphainō**, co-imply, 145,28; 146,23
- sunepinoein**, think of, 146,25
- sunergein**, collaborate, 164,13
- sunerkhesthai**, **sunelthousa**, come together, 103,31; 109,23
- sunistēmi**, **sunistasthai**, be coherent, 143,9; endure, 103,20; be composed, 100,21; 103,34. 104,1; be constituted, 131,21; be put together, 160,8
- sunodos**, concurrence, 157,16
- sunousiōmenē**, permanently resident in, 181,10
- suntelein**, contribute, 178,25; 186,20
- synthesis**, combination, 88,3; 156,21; 157,2-25; assembling, 98,35; composition, 103,23; 112,28.30.31; 113,1-20; 114,2; 120,2-29; 121,6.7.9.11
- sunthetos**, compound, 95,8.10.17; 103,29; 171,15; (of matter and form), 148,17; composite, 88,12; 94,15; 97,24.31; 102,9.16; 104,23; 112,16.18.22.25.27.30; 113,29; 115,6; 116,31; 119,15.16.27; 138,1.5.9.28; 152,19-29; 153,5.8.22; 158,4; 159,8.10; 160,5.24.25.29; 163,20; 164,3.5.12; 167,7.8.10; 171,5; 191,32; 193,8.9; composite item, 103,14.21; complex, 112,30; 119,19.26; composed, 159,2; 164,28
- suntithenai**, combine, 157,6.10.15.31; compose, 103,1; 159,18.19; put together, 89,27; 98,18.34; 99,2; 114,4; 157,6; 160,12; in combination, 139,1; be a combination, 157,14; *suntithemena*, components, 113,8.9
- sustoikhia**, table of correlates, 123,24.31; table, 124,19; 125,6; 126,14-18; parallel columns, 124,2; column, 124,3.9.13.18; 124,26
- sustoikhos**, correlated, 126,19
- tekhne**, craft, 99,5; art, 114,9.16; 147,2
- tekhnetos**, artificial, 132,9; artificial (thing / object), 113,6.7.31; 114,5.6; artefact, 101,22; 115,19; 116,1; 157,3.10; 165,1
- tekhnitēs**, craftsman, 157,5; technician, 191,22
- tekmērion**, testimony, 169,5
- telein**, end up, 131,9.11
- teleios**, complete, 87,15; adult, 103,17; perfection, 186,23; full term, 186,24; *teleiōteros*, more complete, 97,1
- teleiōtēs**, perfection, 128,28
- teleiōtikon**, what perfects, 128,27
- telesphorein**, bring to perfection, 186,22
- teleutaïos**, final, 121,24
- telikon**, final (cause), 148,26
- telos**, finally, 157,34
- tetrapêkhus**, four cubits, 97,3
- theios**, divine, 187,20-3; 188,21
- thêlu**, female, 187,27; 189,6.7
- thêlulon**, feminine, 167,28.29; 168,1
- theologeîn**, engage in theology, 90,9
- theôria**, enquiry, 168,11; study, 152,13
- thermainein**, get warm, 118,23; warm up, 131,15; 156,1; get hot, 139,19
- thermon**, hot, 89,28.32 and *passim*
- thesis**, claim, 88,30; position, 95,20; 117,6.9.11
- tithenai**, posit, 92,21.22; 116,19; 125,17.21; provide, 175,7; offer, 96,7; 133,17; give, 100,22; set down, 105,1; set out, 118,12
- tithênê**, nurse, 182,17; 183,30
- tmêma**, segment, 109,27, option, 143,8; 149,4; section, 89,13
- tomê**, division, 104,1; 105,16; cut, 98,32
- topos**, place, 101,1.3; 106,12; 131,4; 156,1; 176,18; region, 129,2; topic, 192,1; *kata topon*, local, 129,1
- trikhêi diastaton**, (what is) extended in three dimensions,

- 133,31-2; 146,4.9.28; 148,14;  
 157,27; 172,12-13;  
 three-dimensional, 93,8; 156,13;  
 three-dimensional extension,  
 190,23  
**tripékhus**, three cubits, 160,1.2  
**tropos**, way, 138,15, 144,24 and  
*passim*; type, 156,19; 173,31; mode,  
 157,30; 158,30; character, 92,23;  
*tropon tina*, in a way, 160,4.11;  
 161,22-3  
**tugkhanein, hos etukhe**, just  
 anyhow, 97,25.27; in any condition,  
 99,16-17; *ei tukhoi*, say, 116,11;  
 perchance, 117,2; *tukhon*, it might  
 be, 117,3; perchance, 135,8; *to*  
*tukhon*, any, 93,3.5; 114,24; just  
 trivially, 185,22; just any, just  
 anything, 97,19; 98,1.2.4; 109,20-1;  
 111,8-9.11 and *passim*; 143,25-6;  
 155,15-16; 161,30-1; any whatever,  
 98,4; no matter what, 98,8;  
 random, 179,19  
**xainomenos**, carded, 132,10  
**xulinos**, wooden, 162,22.27  
**xulon**, piece of wood, 97,13; plank,  
 121,7; 163,29; timber, 99,3.4;  
 101,21; 134,5.6; 146,21.22.27;  
 157,4.26; 162,23; log, 101,23; stick,  
 113,10; wood, 87,20.25; 162,25.26

# Subject Index

- abakion*, 142n104
- Abdera, Abderite, 61
- Alexander of Aphrodisias, 24n12
- ambiguity, 136n16
- analogy, analogical reasoning, 66, 69, 104-5, 107, 108, 109, 150nn217,218
- Anaxagoras, 3-4, 24n8, 31, 33-4, 38, 39-40, 40-52, 53, 54, 110, 135nn2,5,8, 136n14, 137n38, 139n49, 140n64, 151n236
- Anaximander, 3, 31, 33, 38, 39, 82, 135n2, 136n14, 147n167
- Anaximenes, 3, 31, 82, 135nn2,5, 145n133
- apeiron*, 136nn12,13, 139n54
- apophatic description, 150nn217,218,220
- Aristotle (in the Neoplatonic curriculum), 23; (review of predecessors) 1-2, 23n1; *Physics*, 23n1, 24n2; *De Caelo*, 21; *Metaphysics*, 23n1, 109; *Metaphysics Theta*, 122, *Lambda*, 21, 133; *De Generatione et Corruptione*, 71, 82, 98; *De Anima*, 71; *Categories*, 80, 115
- atoms, 24n12, 54, 60, 135n8, 143n109
- attributes/accidents, 56, 63, 80-1, 83, 100, 108, 146n159, 149n210
- auxiliary cause, 127
- bees, 51, 120, 121
- being, 1, 43, 52-3, 54, 93, 102-3, 111, 115, 118, 124, 125-6, 127, 150n218
- blackboard, 142n104
- categories of being, 71, 72-5, 111-12, 149n196
- caterpillars, 121
- causes, four, 148n180
- change, 1, 61, 63, 65, 85-6, 88, 96-9, 113, 117, 141n93, 143n105, 147nn171,172,175, 148n176, 149n196
- Christianity, 19, 26n31
- circular motion, 145n139
- classification, 111-12
- colour, 144n122
- common sense, 143n113
- contradiction, 121
- creation, 17, 20-2, 25n18, 26n28, 81, 145n139, 153n286
- definition, specification, 75, 96, 101-2, 109, 129, 132-3, 153n280
- Demiurge, 26nn28,31
- Democritus, 9, 39, 54, 60, 61, 72, 137n37
- differentiae, 73
- divisibility (infinite), 4, 6, 24n11, 42-4, 138nn45,46,49, 140n65
- Eleatics, 1, 3, 24n2, 31, 34, 52, 135n2, 136n17
- elements, 63, 74, 77, 90-1, 97, 98, 101, 147n171, 148n183
- elimination, method of, 104, 108, 150n217
- embryo, 149n200
- Empedocles, 9, 24n13, 31, 32-3, 38, 39, 46, 52, 54, 66, 69, 78, 81, 135nn2,10,11, 137nn35,37, 146n156
- entities, 150n215
- eternity 14, 18, 19, 25n18, 76
- fifth element, 25n18
- focal meaning, 75
- form, forms, 1, 11, 14-15, 21-2, 24n9, 25nn20,27, 37, 48, 54, 63, 65 71-3, 75, 80, 98, 100, 102-3, 107-10, 112, 123, 129, 132, 134, 142n94; divine, 128-9; emerge out of nothing, 132, 153n286; 'forms prior to the many', 14-16, 76, 153n290; transcendent, 133; Platonic, 14-16, 18, 19, 25n27, 26n28, 41; formal principle, 133; Form of the Good, 150n218
- formal causation 15-16, 17

- Genesis, 26n28  
*genos*, 12-13  
 geometry, 86  
 God, 21, 22, 128, 129  
  
 heavenly bodies, 13-14, 71-2, 76, 93-4,  
     101, 107, 144n127, 145n139  
 Heraclitus, 3, 31, 135n2, 136n16  
 Homer, 68, 145n135  
 homoiomerics, uniform parts, 3, 32,  
     38-9, 43-5, 46-52, 98, 135n7, 137n31  
 hylomorphism, 5, 21-2, 24n9, 25n27,  
     26n29, 42, 48, 57, 98, 128, 132,  
     142n94  
  
 infinity, 4, 6-8, 33, 40-2, 44-6, 49-50,  
     71, 77, 137n40, 139n54, 146n150  
 insects, 121, 140n61, 73  
  
 knowledge, 11-12, 24n15, 40-1, 46, 71,  
     137n40  
  
 language, 86-7, 95, 117, 123  
*lexis*, 2, 141n90, 153n287  
  
 maggots, 59, 121  
 matter, 1, 16, 20-2, 23, 26nn28,29, 37,  
     48, 54, 57, 73, 76, 80-4, 86-90, 91,  
     95-6, 98, 102-10, 112-14, 119, 121,  
     123-9, 130-4, 135n8, 137n27,  
     142n101, 152n259; ugly and/or  
     female, 129-30; uncreated and  
     imperishable, 130-4, 153n283;  
     created out of nothing, 132;  
     definition of, 132-3, 153n280.  
 medical writers, 148n183  
 Melissus, 31, 34, 52, 53, 116, 135n2  
 Mind, Intellect, 3, 8, 32, 38, 45, 50-1,  
     135n8  
 mixture, 3, 5, 26n29, 42, 57  
 music, 24n14, 57, 59-60,  
     142nn97,98,99  
  
 nature, 1, 85  
 Neoplatonism, 10, 15, 23  
 nothing, *ex nihilo*, 1, 10, 21-2, 25n18,  
     26n29, 33-4, 40, 54, 110-11, 118-19,  
     125, 131-2, 151n236  
  
 one, 43, 53, 109, 123; Neoplatonic  
     One, 150n218  
 Origen, 26n31  
  
 Parmenides, 9, 31, 34, 52, 53, 54, 60,  
     66, 68, 69, 81, 116, 125, 135n2,  
     141nn83,87,88, 145n135  
 Philoponus: method of exegesis, 2-3,  
     8; double discussion, 2, 24n16;  
     Platonism, 10, 20, 25nn18,27;  
     Christianity, 19, 25n18; views on  
     creation, 25n18; originality, 10-23;  
     development of his thought, 17, 20,  
     25nn18,22,23,24; *Contra*  
     *Aristotelem*, 25n18; *In GC*, 22;  
     *Summikka Theorēmata*, 97  
 philosophy, 22-3  
 Plato, 15, 23, 25nn19,20, 37, 62, 84,  
     104, 108, 123-6, 127, 133,  
     152nn269,273; large and small, 9,  
     36, 37-8, 54, 66, 123-4, 126;  
     unwritten doctrines, 136n21;  
     indefinite dyad, 37-8; *Timaeus*,  
     26n28, 150n217; *Phaedo*, 55,  
     141n93, 148n178  
 Platonism, 14, 16, 25n27, 26n28  
 Porphyry, 68, 73, 145n133  
 potentiality, 114-15, 122, 125, 133  
 Presocratic philosophy, 1-2, 3, 8-10,  
     31, 35-6, 84, 135n2, 148n183  
 prime matter, 1, 17, 88, 90, 113, 131  
 principles, first principles, 1, 4, 9,  
     13, 31, 53-5, 65-8, 70-3, 75-6,  
     78-80, 83, 85-6, 101, 102-5, 107,  
     110, 112-14, 133-4, 137n26;  
     formal principle, 133  
 privation, 10-11, 23, 25n20, 58, 64,  
     65, 71-3, 75, 86-90, 95-6, 102-5,  
     110, 112, 114, 119, 123-9, 130-1,  
     133-4, 142n102, 143n120,  
     145n139, 152nn268,276;  
     maleficence of, 127-8  
 proof by elimination, 86  
*protheōria*, 2  
 Pythagoreans, 37, 66, 69, 84;  
     indefinite dyad, 37, table of  
     opposites, 9, 67-8  
  
 qualities, 8; real qualities, 63,  
     143n118; pathetic qualities,  
     142n103  
  
 reality 1, 143n118  
 reproduction, 142n101, 147n175  
  
 Simplicius, 18, 140n74  
 size, 4-5, 41, 46-7, 138n42, 140n64  
 soul, 132, 139n61, 144n127, 145n137  
 species, 73



- spontaneous generation, 51, 59, 120,  
121, 140nn61,73, 152n259
- sublunary bodies, 145n139
- substance, 13, 56, 63, 71-2, 75, 80-4,  
92, 96-102, 108, 126, 142n94,  
146n159, 147nn166,175;  
*homooousios*, 149n198
- substrate, 13, 20, 51, 56, 72, 73, 79,  
80-1, 85-6, 90, 96-102, 112-13, 123,  
137n23, 147n172
- sun, 104-5
- supervenience, 5, 21-2, 26n29, 42, 48,  
57-8, 72, 132
- terminology, 86-7, 95, 117, 123,  
137n27, 141n75, 148n176
- Thales, 3, 31, 54, 60, 66, 82, 135nn2,5
- Themistius, 12, 78, 128, 140n74
- Theophrastus, 53
- three-dimensionality /  
three-dimensional extension,  
17-18, 20, 76, 88, 90, 99, 113, 131
- time, 21
- vice, 11-12, 24n15, 65
- virtue, 11-12, 65, 144n126
- wasps, 51, 59, 120, 121, 152n259
- Xenophanes, 68, 145n135

## Index of Passages

### ANAXAGORAS

**DK59B1:** 137n34

### ARISTOTLE

*Cat.* **ch. 5, 2a11:** 146n161; **ch. 10,**

**12a26-33:** 151n243

*DA* **417b5-7:** 145n138

*De Cael.* **A9 279a28:** 153n281

*GC* **322a8:** 149n199; **329b30-1:**

147n163; **329b31-2:** 147n164

*GA* **724b4-12:** 142n101; **729a22-33:**

142n101; **729a33-b22:** 142n101;

**732b10-15:** 140n73; **758b7-759a4:**

140n73

*Met.* **Alpha 985b13-17:** 143n111;

**Delta ch. 22:** 144n120; **Zeta ch.3:**

151n235; **1029a29:** 146n160;

**Lambda 1072b13:** 153n282;

**1076a4:** 153n289

*NE* **1106b28-33:** 24n15

*Phys.* **bk 1 ch. 1:** 148nn189, 190; **chs**

**2 and 3:** 151n245; **ch. 4: 2; ch. 6:**

137n26; **184a2:** 141n81;

**184a10-16:** 153n291; **184a18:**

145n144; **184b15-25:** 141n80;

**184b25-187a10:** 141nn77, 83;

**185a3:** 141n83; **185a11:** 151n239;

**186a11:** 151n239; **187a10-b4: 2;**

**187a10-b7:** 141nn78, 83; **187a11:**

141n85; **187a16-20:** 152n267;

**187a20:** 136nn18, 19; **187a21:**

136n20; **187a29:** 135n6;

**187b7-188a18:** 4, 137n38,

141nn79, 86; **187b7-13:** 24n7,

137nn39, 48; **187b13:** 139n51,

140nn64, 67; **187b13-21:** 4, 7,

138nn41, 47; **187b13-34:** 139n51;

**187b25:** 7, 138n47; **187b26:**

139n51; **187b35:** 7, 139n51;

**187b35-188a2:** 139n51; **188a2:**

139n53; **188a3:** 8; **188a5-13:**

139n55; **188a10:** 8; **188a15:**

140n74; **188a16:** 140n74, 141n76;

**188a19:** 141n90; **188a27:** 141nn90,

91, 143n114; **188a28:** 141n92;

**188a28-9:** 143n114; **188b10-11:**

142nn95, 100, 143n119;

**188b12-16:** 142n97; **188b22-3:**

144n123; **188b26-189a10:** 25n17;

**188b34:** 24n13; **189a2:** 146n148;

**189a11-17:** 25n17; **189a11-20:** 12;

**189a13:** 147n173; **189a13-14:**

148n185; **189a17-18:** 145n145,

146n147; **189a17-20:** 13, 25n17;

**189a19:** 146nn146, 149; 153n290;

**189a19-20:** 19; **189a21-b16:**

148n181; **189a22:** 146n155;

**189a26:** 146n155; **189a17:**

146n155; **189a32:** 146n155;

**189b18:** 148n181; **189b27:**

148n186; **189b31:** 148n188; **190a2:**

149n208; **190a26:** 147n175;

**190a31:** 147n169; **190b5-9:**

149n197; **190b10-11:** 149n201;

**190b12:** 149nn193, 202;

**190b17-20:** 148n191;

**190b17-191a2:** 151n242; **190b22:**

149n212; **190b23:** 150n222;

**190b23-4:** 150n226; **190b28:**

150n227; **191a18:** 151n134;

**191a23-35:** 10; **191a24-7:** 151n237;

**191a34-5:** 151n249; **191a35:**

151n250; **191b11-12:** 151n255;

**191b13:** 152n256; **191b18:**

152n257; **191b21:** 152n261;

**191b25:** 152n263; **191b35-192a5:**

136n21; **192a22:** 152n275;

**192a29-34:** 144n124; **192a30:**

153n284; **192a31:** 153n288;

**192a33-4:** 153n285; **192a34:** 19;

**bk 2, 193a28-b18:** 146n160;

**195a25-195b4:** 21; **209b14:**

136n21; **bk 5, 229a22** 144n124

*Rhetoric* **1407b11:** 136n16

*Sens.* **3, 439b16:** 144n122

### EMPEDOCLES

**DK31B6:** 135n9, 137n36; **B21:**

137n33; **B23:** 137n33; **B27:**

135n11; **B28:** 135n11; **B31:**

135n11; Strasbourg Papyrus  
a(i)8-a(ii)7: 135n11

HERACLITUS

**DK22B1:** 136n16

HIPPOCRATIC CORPUS

*On Ancient Medicine* ch. 1 CMG

11.63.3: 148n183

HOMER

*Iliad* 2.204: 153n289; 7.99: 145n134

PHILOPONUS

*In DA* 51,13-52: 24n9; 121,10: 24n4;

124,25: 24n4; 238,37: 145n131;

250,12: 145n131; 424,4: 24n3;

424,13: 24n3; 468,23: 145n131;

468,28: 145n131; 542,8: 145n131

*In GC* 169,4-27: 24n9; 169,7: 26n29

*In Phys* 4,8-5,6: 141n82; 4,12-9,3:

153n291; 15,1-2: 143n118;

16,25-30: 25n24; 21,30-33,3:

136n17; 23,3: 135n3; 23,14-15:

135n4; 24,24-25,1: 135n7;

26,21-86,19: 141n77; 27,17:

143n113; 28,8-16: 141n84; 30,5:

151n239; 51,24: 136n15; 51,26:

150n216; 52,30: 149n200;

54,10-55,26: 25n24; 58,7-13:

152n270; 59,7: 151n239;

81,31-82,9: 152n271; 82,26:

152n268; 86,20-96,2: 141n78;

86,21-87,10: 3; 86,29: 142n108;

87,1-4: 137n30; 87,7-10: 136n14;

87,11: 3; 87,21: 3; 87,30: 3;

88,4-23: 137n33; 88,24-30: 137n30;

89,3: 4; 89,3-30: 151n236; 90,5:

24n5; 90,6: 147n165; 90,20:

137n28; 90,22: 137n29;

91,16-93,13: 152n267; 93,13-19:

136n18; 93,15-19: 136n14; 93,17:

24n6; 94,5: 24n6; 94,14: 24n6;

94,18-25: 151n236; 94,21:

151n238; 95,12: 24n6; 95,25: 24n6;

95,30: 150n216; 96: 145n136;

96,3-101,29: 4; 96,3-108,11

141n79; 96,8-10: 24n7, 138n48;

96,26: 139n52; 96,26-30: 4; 96,27:

7, 138n47; 97,23-98,5: 26n30;

97,23-7: 5; 97,24-30: 26n29;

97,25-7: 153n286; 98,13-21: 6;

98,21-5: 6; 99,9: 24n10; 99,26: 7;

99,32: 138n41; 100,22-7: 7;

100,28-101,4: 8; 101,5-17: 8;

101,10: 139n56; 101,17: 140n72;

101,19: 141n75; 101,29: 24n5,

137n39; 101,29-108,11: 4;

102,11-105,5: 138n41; 102,13-24:

140n64; 102,23: 140n64;

102,24-103,5: 140n64; 103,5-12:

140n64; 103,12: 140n64;

103,12-20: 140n64; 103,20-33:

140n64; 103,22: 140n64;

104,30-105,5: 138n47; 105,26: 7,

139n51; 106,5: 8; 106,20: 139n55;

106,20-107,10: 8; 107,14: 140n61;

110,1: 145n135; 110,1-2: 141n89,

143n107, 145nn129, 132; 110,4: 9;

110,13: 9; 110,15: 9; 110,16: 9;

110,17: 141n88; 110,25: 9; 110,27:

143n112; 111,8: 143n113; 111,31:

143n117; 112,17: 142n94; 115,1:

145n140; 115,29: 140nn61, 73,

143n106; 116,3-8: 142n104;

116,17: 141n90; 116,18-19:

145n135; 116,19: 141n88; 116,20:

135n5; 117,23: 141n90; 117,24:

141n90; 118,12: 143n113; 119-20:

10; 119,1: 142n93; 120,20: 24n14;

120,23-121,2: 11; 122,3-8: 11-12;

122,22: 145n137; 123,15: 135n5,

143n108; 124: 9; 125,7: 145n130;

125,10: 9; 125,15: 24n5; 125,25:

141n88; 126,1: 141n88;

127,20-142,1: 137n26; 128,25:

144n127; 129,7-12: 12; 131,15:

147n171; 133,17-21: 13; 133,21-4:

13-14; 133,22-134,11: 153n290;

133,24-5: 14; 133,25-31: 19, 20;

133,25-7: 14; 133,27-8: 15;

133,29-31: 15; 133,31-134,2: 16-17;

133,31-2: 25n21; 134,2-4: 18;

134,4-8: 25n26; 134,18-20:

146n150; 135,25: 12; 136,5-142,20:

148n181; 136,30-137,6: 146n160;

137,12: 146n162; 137,27: 150n231;

138,20: 20; 138,21: 20; 138,22: 20;

139,9: 141n88; 139,14: 147n167;

139,25: 147n168; 140,6: 136n16;

143,6-10: 148n181; 144,11:

148n185; 144,24-6: 148nn177, 179;

144,27-147,34: 151n247; 144,30:

149n195; 144,32-145,2: 148n176;

145,23-147,5: 148n176; 146,22:

104n142; 147,28-34: 149n195;

148,2: 148n179; 148,19: 24n5;

148,27: 148n181; 153,2: 149nn200,

- 208; **153,2-3**: 149n194; **155,11**: 147n169; **156,18**: 149n206; **156,22-157,21**: 149n207; **158,9**: 24n5; **159,4**: 149n193; **160,21-2**: 150n214; **162,5**: 150n229; **162,6**: 150n220; **162,21**: 150n217; **163,13**: 24n5; **164,25**: 150n232; **169,3-174,12**: 151n246; **172,14**: 150n224; **174,17**: 151n237; **174,26**: 151n239; **177,8-9**: 151n251; **177,18-19**: 151n251; **179,6**: 140n73, 143n106; **179,9**: 140n61; **182,17-18**: 152n265; **184,8-12**: 22-3; **184,12-14**: 23; **189,10**: 21; **189,17**: 21; **191,10**: 21; **191,11-29**: 26n30; **191,11-25**: 24n9; **191,15**: 26n29; **191,24**: 22; **192-3**: 20; **192,1**: 22; **192,3-7**: 150n220; **192,17**: 24n5; **193,1-4**: 19, 25n25
- PLATO  
*Phaedo* **71A-D**: 142n93; **99D-102B**: 25n19; **102B-105B**: 25n20; **102D5-103A1**: 148n178; **102E**: 142n93; **103A-C**: 141n93; **104C**: 142n93
- Republic* **506E-509B**: 150n218; **506E**: 150n221; **509B**: 150n218; **509D-511E**: 150n218; **514A-518C**: 150n218  
*Sophist* **258A**: 152n268  
*Timaeus* **46C-E**: 152n273; **50A-C**: 150n217; **50B**: 152n266; **50D-51E**: 150n217; **52B**: 150n219
- SIMPLICIUS  
*In Phys.* **170,9**: 24n12; **188,32**: 145n133
- THEMISTIUS  
*In Phys. Paraphrasis* **18,20-2**: 143n115; **21,3-4**: 146n154; **33,2-5**: 152n274
- THEOPHRASTUS  
*De Sensibus* **12,59**: 144n122; **86**: 137n24
- XENOPHANES  
**DK21B29**: 145n133