

Aristotle, Physics I.9 (191b35-192b4): two principles or three?¹

Thematically the passage consists of two discussions, 191b35 – 192a27 (Argument 1) and 192a27-34 (Argument 2), followed by a coda, 192a34-b4. Argument 1 brings out differences between a Platonist account of coming-to-be and the triadic scheme of subject, form, and privation, as developed earlier in *Physics* I, and it shows some absurdities of the former. Argument 2 brings out a sense in which, in Aristotle's scheme, the matter or 'underlying nature' is imperishable and ingenerable.²

Section A: Translation and comments

Argument 1, 191b35-192a27

Others too have touched on it, but not adequately. They first agree that a thing simply comes to be from not-being [192a1] (in this respect Parmenides in their view is right), and then it appears to them that if <something> is one in number, it is also only one in function (δυνάμει). But this is a very different point.

Our view is that matter and privation are different, and that one of them – namely, the matter - is that-which-is-not in virtue of concurrence, [a5] whereas the privation is <not-being> in virtue of itself; also that one of them – namely, the matter – is near <to substance> and *is* substance (οὐσία) in a way, whereas the other is not so in any way. For them, by contrast, that-which-is-not is the Great and the Small, without differentiation (ὁμοίως) - whether what one takes is the pair together or each of the two by itself. So this

¹ My thanks to Andreas Anagnostopoulos, Sean Kelsey, Diana Quarantotto, and Barbara Sattler for valuable comments on a previous version.

² This division puts ὡς μὲν γὰρ τὸ ἐν ᾧ ... στέρησις into Argument 1 and the answering sentence ὡς δὲ κατὰ δύναμιν κτλ into Argument 2 (192a26-29). If this seems too awkward one can begin Argument 2 at φθείρεται (25), following Ross.

latter way of having a triad is completely different from the previous one [sc. Aristotle's]. They did get far enough [a10] to see that a nature (φύσιν) of some kind must underlie, but they make it one (μίαν). For even if someone makes it a dyad, calling it Great and Small, he is still doing the same thing: he overlooked the other <nature>. For the one <nature> remains, and with the form (μορφῆ) is joint cause, like a mother, of the things that come to be; but the other part of the contrariety, if one focuses one's thought on its maleficence (τὸ κακοποιὸν αὐτῆς), might often (πολλάκις) [a15] give the impression of not even being at all.

For granted that there is (1) something divine and good and desirable, *we* say that there is on the one hand (2) its contrary and on the other hand (3) that which by nature desires and reaches towards it in accordance with its own nature. But the implication for those <thinkers> is that the contrary reaches towards [a20] its own destruction. Yet it is impossible both that the form (εἶδος) desires itself - because it is not in need of anything - and that the contrary desires it - since contraries are destructive (φθαρτικὰ) of each other. Rather, that <which desires the form> is the matter, like female desiring male and ugly desiring beautiful - except that <the matter> is not something ugly nor yet female in virtue of itself but in virtue of [a25] concurrence. And in one way it perishes and comes to be, but in another way it does not. As that-in-which (τὸ ἐν ᾧ), it perishes in virtue of itself - for what perishes, the privation, is in this.

Argument 2, 192a27-34

But considered in terms of its function (ὡς ... κατὰ δύναμιν) it [sc. the matter or the underlying nature] does not <perish or come to be> in virtue of itself; it must, rather, be imperishable and ingenerable. For if it was coming-to-be there would have to be some primary underlying thing from which [a30] as constituent it comes to be: but this is the nature itself [i.e. the material principle], so that it would be before it came to be. For by matter I mean the primary thing that underlies in each case, from which as constituent something comes to be not in virtue of concurrence. And if it perishes, that is where it will finally arrive, so that it will have perished before it perished.

Coda, 192a34-b4

As for the form-principle (τῆς κατὰ τὸ εἶδος ἀρχῆς): whether it is [a35] one or many, and which it is or which they are, are matters whose detailed determination is the task of first philosophy; so we may set them aside for that occasion. In the expositions which follow [192b1] we shall be speaking of natural (φυσικῶν) and perishable forms εἰδῶν [or: kinds].

That there are principles, and which they are, and how many in number, can be taken as fully discussed. Let us then mark a new start in what we now go on to say.

191b35: Others too have touched on it, but not adequately. ‘Others too’: the Platonists or some of them. The referent of ‘it’ is ‘this nature’, 33-4, which must refer back to ‘the underlying nature’ (or: the underlying matter’ on Simplicius’s reading) at 191a8. Aristotle often speaks of ‘touching on’ a topic or theory, e.g. *Physics* III, 203a2; *Metaphysics* I. 988a23; 29; 32. The perfective conveys that these thinkers are current presences for Aristotle, although this does not imply chronological simultaneity; at *Metaphysics* I. 988a29 ‘have touched on this sort of cause’ is said of Empedocles and Anaxagoras along with Plato.

191b36-192a1: They first agree that a thing (τι) simply (ἀπλῶς) comes to be from not-being (in this respect Parmenides in their view is right) That is: they agree with Parmenides in making **from not-being** a condition of coming to be, a condition which he, of course, held to be unintelligible. Does ἀπλῶς qualify γίνεσθαι alone (this seems to be the understanding of Hardie and Gaye), or γίνεσθαι τι ἐκ μὴ ὄντος (cf. Charlton’s translation), or ὁμολογοῦσιν (cf. Charlton’s note, p. 47)? Logically, the last two options make the same point: ‘they understand coming-to-be out of not-bring as a simple issue’ is tantamount to ‘they understand coming-to-be from not-being in a simple – i.e. too simple – way’. This is the criticism developed in Argument 1; the ground for it has been laid in I.8. Hardie and Gaye’s construal suggests the contrast between coming-to-be *simpliciter* by contrast with coming-to-be so and so, e.g. cultured; but, as Charlton points out, this distinction plays no part in the ensuing argument.

According to Ross (1936, 497; cf. Charlton, 81) the view attributed here to Parmenides is the dilemma which according to Aristotle baffled the ancients: ‘Necessarily, what comes to be comes to be either from being or from not-being, but both are impossible’ (191a23-31). But if so, why mention just one side of the dilemma? The allusion is more likely to be to Parmenides’s argument that (a) coming-to-be is unintelligible because (b) it would be from not-being, and (c) not-being is unintelligible (fr. 8, 7-9). Aristotle says that the Platonists agree with Parmenides on (b); he implies that they reject (c) and therefore reject (a). Parmenides equated not-being with not-being anything at all, but in the light of Plato’s *Sophist*, the Platonists would hardly have agreed to this.³ Rather, they agree with Parmenides in emphasizing the not-being aspect of the *terminus a quo* of becoming. This is by contrast with those

³ But see Section B, paragraph 3, for the possible relevance of the Parmenidean total not-being.

natural philosophers who saw it as impossible that things should come to be from what-is-not and concluded that they must come to be from what-is, namely their imperceptible constituents (187a34-b1). The Platonists are right, Aristotle implies, to recognize the ‘from what is-not’ aspect of becoming, but he faults them for overlooking the matter-principle, which is not not-being *per se* but is only coincident with not-being (192a3-5; cf. 191b13-16); this simultaneously secures the ‘from what-is’ aspect in a non-paradoxical way.⁴

192a5-6: the matter is near <to substance> and is substance (οὐσία) in a way On matter as nearly substance cf. *Metaphysics* VIII, 1042b9; 1044a15; IX, 1049a36. In the Platonism targeted here, only the formal principle would count as οὐσία; hence the material factor, although not absolutely nothing – it is the Great and the Small – is very far removed from οὐσία. Cf. *Timaeus* 52d3 where the formal principle is ὄν (cf. 51a1), whereas the Receptacle or χώρα is said to be πάντων ἔκτ’ ἔδον and intelligible only in the most puzzling way (51a7-b2).

192a6-12: For them, by contrast, that-which-is-not is the Great and the Small, without differentiation (ὁμοίως) - whether what one takes is the pair together or each of the two by itself. So this latter way of having a triad is completely different from the previous one [sc. Aristotle’s]. They did get far enough to see that a nature of some kind must underlie, but they make it one (μίαν). For even if someone (τις) makes it a dyad, calling it Great and Small, he is still doing the same thing: he overlooked the other <nature>.

In the view reported in the first sentence I take **that-which-is-not** as grammatical subject, with **the Great and the Small** as complement (thus Ross 1936, 348). This way round (Charlton adopts the other) gives a better contrast with the first part of the previous sentence, 192a3-5, where **our view** lays emphasis on not-being, i.e. on the difference between the matter’s incidental not-being and the not-being imported by the privation *per se*. **ὁμοίως**, then, means that there is no such differentiation of not-being in the Platonist theory (thus Charlton, 21). This construal is clearer with Ross’s comma after **ὁμοίως**. Without the comma the meaning could be that conflating that which is-not with the Great and the Small comes to the same thing whether one takes the Great and the Small as a single pair or separates them into two (thus Ross 1936, 497 and Hardie and Gaye). In any case, **this latter way of having a triad** refers to taking **each of the two by itself**, since only so can the Platonists have the semblance of three principles. The Great and the Small was often called a dyad, but its duality allows for no difference between the

⁴ I am especially indebted to Sean Kelsey here.

coincident and *per se* ways of non-being that distinguish matter from privation and, with form, give the three Aristotelian principles. Here Aristotle indicates that the number of things named as principles is unimportant compared to the number of distinct principial roles (cf. 190b29-30; 35-191a7). Whether you look at the Platonists' Great and the Small as *itself* single or double, it or the pair of them only ever has one and the same *role*. Thus even when the Platonists glimpse the underlying nature **they make it one** (192a10-11), i.e. they make this the only principle additional to the form-principle. At these moments they either **overlook** (12) the privation altogether or completely merge it with the underlying nature. In sum, this passage features two cases of the same thing appearing as both two and one. (a) The Great and the Small can be taken as double or single (two directions or one range⁵); as double it counts in a way as two principles, which gives the Platonists three. However, *this* doubleness of the Great and the Small is unimportant for Aristotle here; it does not make the Platonist account any less inconsistent with his own. (b) Matter, or what underlies, is one factor and not-being or privation is a second; but the self-same Platonist Great and Small (whether seen as double or not) figures sometimes as underlier (9-10), sometimes as that which is-not (6-7), hence in effect it is both. This is the duplicity intolerable to Aristotle.

At 11, **someone** i.e. Plato. At 187a17-18 Aristotle makes a similar observation naming him.

At 12 **the other <nature>** i.e. the privation (called **the other part of the contrariety** at 14). It may seem strange to say that a privation is a nature, especially given the near synonymy at times of φύσις with οὐσία (see e.g. *Physics* II, 193a9; 20; cf. 192b32-34). But at 193b19-20 Aristotle says that privation in a way is form, on which see Ross 1936 *ad loc.*, 505-6.

192a13-16: For the one <nature> remains, and with the form (μορφῆ) is joint cause, like a mother, of the things that come to be; but the other part of the contrariety, if one focuses one's thought on its maleficence (τὸ κακοποιὸν αὐτῆς), might often (πολλάκις) give the impression of not even being at all.

Aristotle speaks *in propria persona* here, but **like a mother** must be a deliberate echo of *Timaeus* 50d2-4 and 51a4-5; (cf. 49a6 and 52d5 on the 'nurse' of becoming). He is alluding to the Platonist doctrine that

⁵ Thus sometimes Aristotle speaks of the Great and the Small, e.g. 192a7 and 187a17, and sometimes of the Great-and-Small, e.g. 192a11-12; *Metaphysics* III, 998b10; XIII, 1083b23 and 32; XIV 1087b8; cf. I, 992a11-13. Ross 1924 vol. I, lxi, traces the second locution to Plato, the first to Xenocrates.

their second principle (the Great and Small or the Receptacle) is responsible for evil (*Metaphysics* I, 988a7-15; XIV, 1091b30-1092a5).

the other part of the contrariety refers to the contrary of the form. It is natural to take **αὐτῆς** at 15 as referring to this contrary. **τὸ κακοποιὸν** is in antithesis to **something divine and good and desirable** at 17. Ross 1936, 497, explains **τὸ κακοποιὸν** as destructiveness (‘association with φθορά’). Perhaps it was a Platonist notion that merely excluding good causes evil.⁶ One can only guess at Aristotle’s exact turn of thought here. It may be this: if the Platonists look for the contrary of ‘something divine and good and desirable’ on the assumption that what they are looking for is something *maleficent*, they would in many cases (πολλάκις) miss the contrary and hence conclude that it simply doesn’t exist. (For in many cases a contrary of the good is not a positive evil [cf. *Categories* 12a14-25; *Metaphysics* V, 1023a5-7], but is neutral - as indeed the underlying nature is, as such, neutral). Aristotle is trying to explain how the Platonists might have reached their dyadic position, or anyway the version that equates the Great and the Small with just the nature that remains.

192a16-25: For granted that there is (1) something divine and good and desirable, we say that there is on the one hand (2) its contrary and on the other hand (3) that which by nature desires and reaches out for it in accordance with its own nature. But the implication for those <thinkers> is that the contrary reaches towards its own destruction. Yet it is not possible either (οὔτε) that the form (εἶδος) desires itself - because it is not in need of anything – or (οὔτε) that the contrary desires it - since contraries are destructive (φθαρτικὰ) of each other.

The genitive absolute at 16-17 marks common ground between Aristotle and the other side. I follow Ross 1936, 498, in reading **ὃ** at 18. The pleonasm **πέφυκεν ... κατὰ τὴν αὐτοῦ φύσιν** (18-19) stresses the fundamental difference of the third principle from the principle that is the contrary. Aristotle argues that since the Platonists in effect identify these two, they view the contrary of the good as by its very nature reaching towards the good, hence towards its own destruction: which Aristotle seems to think is obviously absurd (cf. *Metaphysics* XIV, 1092a1-3).

I understand **οὔτε ... οἶον τε ... οὔτε** at 20-21 as claiming that just as the first limb is impossible, so is the second. No doubt it is undeniable that the form, which is good, cannot hanker for itself (cf. Plato, *Symposium* 200b-c), but it is harder to dismiss the idea that the contrary can hanker for the form, and so in

⁶ Thus the contrary is the formal cause of evil. On the use of -ποιός for the formal cause, cf. *Nicomachean Ethics* 1144a3-6.

a way for its own destruction. Treating this as absurd arguably begs the question when the passage of arms is with Platonists. In the first place, if Aristotle simply assumes that nothing of itself can tend towards its own destruction, the other side could reply that this is false because their non-formal principle does precisely that. They could then point out that it makes all the difference whether this contrary-and-underlying principle is understood as able to attain the good at which it aims. If it does attain it, then as contrary it must be destroyed while as underlying it must remain, which is a contradiction given that this is a single principle. But there is no obvious contradiction in the idea that the contrary necessarily always only *tends* towards the good. If so, there is no reason to distinguish underlier from contrary since they never part company. It would again beg the question for Aristotle to insist that whatever tends towards some end *E* must in principle be able to arrive at *E* so as actually to become or possess it. (On sensible objects as only ever reaching towards the Platonic Form, see *Phaedo* 74d – 75a; for a similar structure see *Philebus* 53c – 54c; also *Symposium* 200a-201c on ἔρως as a non-beautiful power reaching towards the beautiful). Moreover, the premiss ‘contraries are destructive of each other’, 21-22 (cf. *Phaedo* 103d-105a) is self-evident only in a sense too weak to support Aristotle’s conclusion. Self-evidently, contraries are mutually destructive in the sense that *if* a subject were to acquire one it would necessarily lose the other, but it is not self-evident that contraries are in all cases actually realizable potentials to obliterate one another, since this depends on the same question-begging assumption, namely that the subject of one contrary is metaphysically able to become subject of the other.

Secondly, Aristotle himself elsewhere recognizes things that naturally tend towards their own destruction. (a) In *On the Heaven* I, 281a2-32, he postulates that finite (in both temporal directions) states of being *P* and not-being *P* (or being not-*P*) have inherent spans of duration, such that each by its own nature brings itself to an end so as to give way to the opposite.⁷ (b) In *Physics* III. 1 he defines movement or change as something that both *is towards* a terminus and ceases to be once the terminus is reached. Moreover, being in *T*-ward movement is in a sense contrary to being at *T* (or being *T*) in that these are mutually exclusive properties of the subject. Aristotle, of course, emphasizes the differences between the being and actuality of three entities: the movement; the subject of movement which existed before the movement began and will do so when it is finished; and the result, e.g. the built house, which exists when the movement is finished (201a27- b13). But it is perfectly in keeping with Platonism to view the very being of the subject as consisting precisely in a interminable movement towards the good, i.e. the form, and hence as essentially negative because always falling short of the terminus. Aristotle places himself in a somewhat

⁷ Cf. *On Generation and Corruption* II, 336b10-15, where the annual approach and recession of the sun provide the conditions that implement the inherent life-spans.

analogous situation when conceptualizing the infinite as something that only ever potentially exists since its actuality can only be in an uncompletable succession (*Physics* III, 206a14-28). And what about Aristotle's endless celestial motion in *Metaphysics* XII? Its ultimate cause is a presumably never attainable object of desire and love (1072a25-b4).

It would seem, then, that Aristotle is over-ambitious in *Physics* I. 9 if his aim is to show that an account of coming-to-be that integrates the underlying or material nature with the contrary, thus recognizing just one non-formal principle, is simply unintelligible. For this is not so. And as we shall see (Section D below) Aristotle himself in certain contexts does away with the contrary or privation, thus reducing his own principles to two.

192a22-25: Rather, that <which desires the form> is the matter, like female desiring male and ugly desiring beautiful – except that <the matter> is not something ugly nor yet female in virtue of itself but in virtue of concurrence.

Here as at 14 Aristotle speaks for himself while using imagery congenial to the other side. The female-male image is a powerful tool for them. Clearly, female is *both* contrary to male *and* is the male's *συναιτία* in reproduction: their contrariety is essential to their complementary co-operation. The Platonists can appeal to this familiar model to explain and defend their dyadic position about coming-to-be. For once form is identified with male the contrary of form is inevitably cast as female, yet the female is still the fellow-parent, i.e. the material principle. Thus the contrary is indistinguishable from 'the nature that remains'.

Aristotle himself in different places treats female (a) as contrary to male, and (b) as recipient or matter in relation to the male. For (a) male and female as contraries see *Generation of Animals* IV, 766a21 and b16; cf. the Pythagorean list of opposite principles, *Metaphysics* I, 986a22-26. For (b) female as recipient and providing the material principle, see *History of Animals* V, 541a2 and *Generation of Animals* I, 729a9-11; b4; 738b20-35. In our present passage, by stating that *matter* is what desires the form, not the female as such since the female is only concurrent, he identifies female with the contrary or privation of beautiful form. This is despite the fact that at 192a13-14 it was the remaining nature that was like the female parent. Female is now on a par with ugly (although it is obscure whether ugliness is mere lack or a positive evil, *κακοποιόν*, 15). This switch in assigning the female role – first to matter as such, then to the contrary or privation - may be a deliberate parody of the Platonists' ambivalence about their non-formal principle.

192a26: As **that-in-which** (τὸ ἐν ᾧ), it [sc. the matter or underlying nature] perishes in virtue of **itself - for what perishes, the privation, is in this**. The word **this** must refer back to **that-in-which**: but what does the latter refer to? It cannot refer simply to the subject underlying the whole process from privation towards form, because this subject does not, as such, perish. Some interpreters therefore take the sentence up to **for** (γὰρ) to mean: ‘the matter [sc. underlying the whole process], considered <just> as that-in-which-the-privation-is, perishes as such’. (Thus Ross 1936, 498, with Philoponus and Simplicius.) This gives the right logical sense, but now **for** introduces a tautology: ‘what perishes, namely the privation, is in that-in-which-the privation-is’. It is better to take **that-in-which** as referring not to the matter underlying the whole process, but to the *contrary* itself positively described. The privation of the form is ‘in’ this contrary in the sense of being based on it or consisting in it: e.g. privation of sweetness in an apple is based on or consists in the positive sourness of the unripe fruit. (For this sense of ἐν see *Physics* IV, 210a20-21, where one example is ‘health in hot and cold factors’.⁸ The hot and cold factors are not themselves a subject that changes between being healthy and being unhealthy: they are what health, when present in its subject, consists in or supervenes on.) So at 192a26 Aristotle says in effect: ‘the matter considered as positive contrary perishes as such’. On this reading **what perishes, the privation, is in this** is not tautologous, since **this** and **that-in-which** refer to the matter considered as locus (not of privation but) of the *terminus a quo* positively conceived.

The consideration introduced by **for** could be evidence for what precedes, or an explanation of it, or both. Does Aristotle think it more obvious that the privation perishes than that the positive contrary does, hence uses the former claim to support the latter? Or does he think that the perishing of the positive contrary is due to or governed by the perishing of the privation? He surely at least thinks this to the extent that he agrees with the Platonists in putting explanatory weight on the divine quality and goodness and desirability of the form (192a16-17), since from this point of view the emphasis is on overcoming privation rather than displacing whatever positive condition may happen to underlie the privation..

192a27-34: This passage (Argument 2) explains a sense in which matter as persisting *hupokeimenon* of coming-to-be is ‘imperishable and ingenerable’. For ingenerability the argument seems to be this: insofar as *X* is coming-to-be *Y* (e.g. bronze coming-to-be a statue), *X* cannot be what is thereby coming into being, i.e. *X* cannot be identical with *Y*, the objective or *terminus ad quem*. For otherwise *X* would have come to be only when *Y* has come to be. But *X* as matter of the coming-to-be of *Y* is the primary, i.e., immediate constituent of *Y* from or out of which *Y* comes into being (cf. *Physics* II, 193a10-11.) This implies that *X*

⁸ At the meeting Marwan Rashed also suggested this interpretation.

exists before *Y* comes into being. Hence if *X* is both matter and *terminus ad quem* (of a given episode of coming-to-be) *X* will turn out to exist (ἔσται, 30) before *X* comes into being (and so too for *Y*). Therefore the matter, as such, of a given coming-to-be is necessarily not what is thereby generated; hence in this logically limited context it is necessarily ungenerated. On imperishability: if *Y* is primarily constituted from matter *X* (*Y* is the statue, *X* is the bronze), and if ‘*Y* perishes’ means that *Y* perishes into its primary material constituent (the statue is melted back into a lump of bronze), the matter in this episode of perishing cannot be what perishes. For the primary constituent immediately survives, and retains its δύναμις (192a27) to be made again into a statue or into any object (a shield, a dish) which might have previously been made from it instead of the original statue. The primary constituent’s own perishing (as when this piece of bronze decomposes into water and earth) will be the last thing that happens to it. So *X qua* what *Y* immediately perishes into is necessarily not what perishes in this episode of perishing. As such and within this frame *X* is immune to perishing, hence imperishable; for otherwise it will have perished before it perishes.

It may seem to us that what Aristotle is arguing for here is too obvious to need argument. Perhaps, however, by showing how his own account allows for a sense in which matter is ingenerable and imperishable, he brings out a sort of continuity between himself and certain predecessors, although their position is naïve compared to his. The theories of Empedocles, Democritus, and in a way Anaxagoras, discussed earlier in *Physics* I, all posit literally everlasting material principles (see also II, 193a17-28). So too in its own way the Platonist theory targeted in chapter 9. It is not easy to resist the view that the principles of coming-to-be and perishing are themselves straightforwardly immune to coming-to-be and perishing. For if all principles come-to-be and pass away, (a) it is not clear how they deserve to be considered principles as distinct from things that principles are supposed to be principles *of*. And (b) since all comings-to-be and passings away demand to be explained by principles, if all principles come to be and pass away there will be an infinite regress of principles; hence arguably no principle is in the end a real starting point and principle (cf. *Metaphysics* II, 994a1-b31; III, 999b5-9; 1000b23-29). Against this background we can see Argument 2 as not so trivial after all. This is because it shows a way of satisfying the virtually universal assumption that principles must be ingenerable and imperishable. E.g. the *hupokeimenon*-principle is ingenerable and imperishable in the sense that, for any episode of change, the particular empirical item that plays the role of *hupokeimenon* cannot, as a matter of logical necessity, play the role of that which comes to be or the role of that which perishes. So: *qua hupokeimenon* of a given change, the item is indeed beyond reach of coming-to-be and passing away. At the same time Argument 2 underpins the real possibility of coming-to-be and perishing. For denying the force of this argument commits one to equating *X* with *Y*: that which, as it were, does the coming-to-be with what it comes to be,

and that which perishes with what remains after the perishing, so that things change only into and from themselves: i.e. they change not at all. Moreover, much of *Physics* I drives home a major general lesson of which the present argument is just one application. The general lesson is that we should think of principles of change not as special pre-eminent things – whether corporeal, empirical things or incorporeal, non-empirical things – but as necessary roles or functions in the coming about of change. Once this is understood we can see that a given thing which in one context functions as what something is coming-to-be can, once this has been concretely achieved, function in another context as *hupokeimenon*, and in another as bearer of the privation (more on this in Section B, paragraphs 20, and Section F, 37 - 39). So there is no reason (on this basis at least) why whatever is the matter of a given coming-to-be should not itself have been generated from prior matter in an earlier episode of coming-to-be, and so on even indefinitely; nor why that which was the *ad quem* of a given coming-to-be should not itself, now realized, act as *hupokeimenon* of the distinct coming-to-be of some new *ad quem*, and so on even indefinitely.

At *Metaphysics* VII, 1033a24-b19 (cf. XII, 1069b35-1070a4) Aristotle has an argument rather similar to Argument 2, with these differences: it makes the case about form as well as matter (in fact focusing more on form); it does not use the terms ‘imperishable’ and ‘ingenerable’, and perishing is not mentioned; it revolves round the notion of an agent’s making *X* into *Y*, whereas Argument 2 speaks only of *X*’s becoming *Y*; and it explicitly invokes the absurdity of infinite regress.⁹

192a34-36: As for the form-principle (τῆς κατὰ τὸ εἶδος ἀρχῆς): whether it is one or many, and which it is or which they are, are matters whose detailed determination is the task of first philosophy To launch the science of nature (‘second philosophy’), we do not need to have settled questions of first philosophy such as whether the form-principle involved in coming-to-be is a separate incorporeal substance as the Platonists assume.

192b1: the natural and perishable forms [or: kinds] Does this mean natural and perishable individuals according to their kinds, or does it refer precisely to the *forms* of such individuals, i.e. to their structures, patterns of organization, which in particular instances will cease to exist through natural causes? Philosophically it makes little difference. Nor at this stage does it matter whether one takes ‘and perishable’ as epexegetic of ‘natural’ or as an additional determination. Aristotle could have expected Platonists in his audience to take it epexegetically (everything natural is in principle perishable), while

⁹ See note 43 for the argument.

keeping in reserve his own theory of individuals that are both natural and *not* perishable because everlastingly in movement. The proof that there even are such beings lies far ahead in the *Physics*, in Book VIII.

192b2: the expositions which follow According to Ross 1936, 498-9, this is a general reference to Aristotle's physical works, not just to the *Physics*.

Section B: Philosophical background

Whether or not Argument 1 succeeds as a refutation of the Platonist position (on which see Section C below), it certainly brings out deep differences between the Platonists and Aristotle on the principles of coming-to-be. Most of this section will be concerned with Platonic sources and materials relevant to the Great and the Small in Argument 1. It will mainly focus on the Phileban Unlimited and the Timaeon Receptacle (*Philebus* 23c – 27 c; *Timaeus* 48e2-53a7).¹⁰

(1) The Great and the Small in Argument 1 resembles the Receptacle insofar as the latter is one of just two principles of becoming, namely paternal form and that which underlies.¹¹ In the *Philebus*, by contrast, we have three principles: the Timaeon paternal formal one has turned into two, namely Limit (τὸ πέρας) and Intelligence (νοῦς), the distinct efficient cause. These two along with the Unlimited give a triad of principles, but one very different from Aristotle's own form-matter-privation, which makes no reference to efficient causality. If we set aside νοῦς from the Phileban triad, what remains is a pair of principles closely approximating the Platonist pair targeted in Argument 1. I shall now consider the Phileban Limit and Unlimited in more detail.

¹⁰ One of many uncertainties concerns the term ὅλη (for I. 9 see 192a3, 6, 22, 31). We do not know whether Aristotle takes the Platonists to be using it too, and in something like a technical Aristotelian sense. At *Physics* I, 4, 187a16-18, where he says that Plato treats the Great and the Small as ὅλη, he could be describing the view entirely in his own terms, or reproducing something said by Plato outside the dialogues. See Kelsey, 2010, on the term ὅλη in *Physics* I.

¹¹ On the relevance of the *Timaeus* to the Platonic theory targeted by Aristotle, see Johansen, 2010.

(2) These two are in a way contraries. (So too in a way are the Unlimited and the Limited, i.e. the result of ‘mixing’ Unlimited with Limit. But the Limited is a product, not a principle.) In the *Philebus* the Unlimited is not called ‘the Great and the Small’ in so many words, but it fits that description well. It is illustrated by the hotter and the colder, the stronger and the milder, the dryer and the wetter, the taller and the shorter, the high and the low in acoustics, the faster and the slower; and it is explained generically as the more and the less (24b5; c2-3; e7-8; 25c10-11). A specimen of the Unlimited is as such without determinate poles: any notional point on it is more/less than something that is more/less than something else, and so on. Thus such a range, if we can even call it that, is not between contraries (understanding contraries not merely as mutually exclusive but as the extreme opposites determining a range [*Categories* 6a18; *Metaphysics* V, 1018a25-31; X, 1055a3-21]). Without the imposition of Limit (e.g. the equal or the double or some definite number), the range has neither poles nor intermediate positions defined by distances from poles or ratios thereof (cf. *On Sense* 439b20-440a6 on the colours as combinations of black and white). At *Philebus* 25e1 Plato speaks of the imposition of a member of the class of Limit as ending the ‘conflict’ (διαφόρως ἔχοντα) between the more and the less.¹² Perhaps he means that in the raw Unlimited any given ‘point’ or ‘stage’ (if identifiable at all) is simultaneously both more (or more so and so) and less, which seems to be a contradiction because there are as yet no distinct definites *A* and *B* such that the stage can be seen to be more *than A* and less *than B*. It would be equally true, and closer to the concerns of *Physics* I. 9, to say that in the Unlimited or the Great and the Small as such there is no contrariety and no mutual exclusion of properties, nor even the appearance of contradictoriness, because there are no determinate properties to entail each other’s negations. But when the accession of Limit has marked out the Unlimited into a series of positive determinate natures, these are mutually exclusive in the sense that no particular or individual subject can possess more than one at a given time. However, the Unlimited itself possesses or contains them all rather as a genus contains its species. Hence in the Unlimited *itself*, once it has been marked out into a series of determinate natures, there is no privation or absence of any of these natures: they are all in it. The Unlimited can be thought of as a *hupokeimenon* – a sort of substrate – of these specific determinations, but with respect to them it is not a subject of physical change, nor of anything suitably analogous to physical change; i.e. it is not a sort of place or seat such that the presence in it of one determinate property excludes the presence of a contrary that could be present but is not.

¹² See Delcomminette ch. IV for a recent full discussion.

(3) The Unlimited in itself, moreover, can be thought of privatively, i.e. as incomplete apart from the accession of Limit and the consequent ‘breaking out into’ determinate properties. There seems to be a contrast in terms of metaphysical or logical before-and-after between the Unlimited as incomplete and ‘then’ completed through pluralization into determinates. The non-temporal ‘transition’ is to having a whole set of mutually incompatible determinate properties from lacking them all. (That comprehensive lack of all determinations of, say, hotter-and-colder, is a restricted version of the absolute non-being which Parmenides forbids us even to touch on and which is dismissed in the *Sophist*, 257b – 259b¹³). Since these ‘moments’ or ‘phases’ of the Unlimited cannot coincide (they would cancel each other out), must they in some unimaginable sense ‘take turns’? Or rather than incurring the burden of defending something unimaginable as also not meaningless, shouldn’t we think of the ‘moments’ as corresponding to two perspectives that cannot be combined? There is the Unlimited considered apart from the range of determinates which it makes possible, and there is the Unlimited considered as the material of the, so to speak, actualized range. Absent a way of making non-temporal sense of ‘first one, then the other’ we cannot integrate the data of both perspectives. And from each of the perspectives there are just two principles. In the first there is Limit and the Unlimited considered as privation of Limit or form, and in the second they have combined and the Unlimited is an underlying presence. To count the privation and underlying presence as distinct principles, bringing the number up to three, we need to be able to synthesize our grasps of them in one perspective. But the only imaginable way in which we could do that would be if they appeared to us in temporal succession. And in that case what would appear would not be the wholesale absence and then the wholesale presence of an entire range of determinate contraries: it would be one already constituted determinate contrary followed by another. It would be an empirical change structured by temporal succession.

(4) Given Aristotle’s complaints against the Platonists in *Physics* I.9, it is rather surprising that precisely this latter sort of coming-to-be, i.e. the empirical, temporal, sort is something which Plato himself at *Phaedo* 102d – 103c not only takes seriously but seems to understand in terms of the triadic framework. In disambiguating the idea of change among determinate contraries he shows that: (a) one contrary as such, e.g. the hot as such, or the Hot, cannot become the cold as such; (b) the hot ‘in us’, e.g. in Socrates, cannot become cold;¹⁴ and (c) a concrete (as we might put it) entity such as Socrates that has one of these

¹³ Cf. Cherniss, 92 – 93.

¹⁴ The example in the text is ‘the tallness in us’ (102d7), but I have changed this to avoid the complications of a relational property.

qualities can come to have the other albeit not at the same time: when one approaches the other ‘flees and retreats, or is destroyed’ (102d5 – e3). So here Plato recognizes a distinct subject which at a given moment received (δεξιόμενον) hotness (from having been cold, hence not hot) yet remains itself (102e2 – 5). Thus he clearly recognizes the differences between: (i) the receptive *hupokeimenon* that remains; (ii) the privation of heat, implied by cold, that disappears; and (iii) the heat that takes the latter’s place. But these are precisely Aristotle’s three principles.¹⁵ Moreover, Plato’s argument depends on understanding contraries as destructive of each other. On this basis one may wonder how Aristotle can in good faith accuse Plato of ‘overlooking the other nature’ (192a12).

(5) Clearly for Plato different levels are in play. The *Phaedo* passage is about physical change of an individual subject from one to another of mutually exclusive mathematical or empirical contraries, whereas the Phileban Limit and Unlimited is about the timeless ‘generation’ of sets of such contraries whose determinateness is precisely what enables them to *be* mutually exclusive. The first set-up points towards a three-principle schema such as Aristotle wants for physics; the second is a two-principle schema to be studied as a topic in the metaphysics of intelligibles. The contraries generated in the latter are, in that context, metaphysical products, not principles; they are thereby available to act as principles of physical change in accordance with the triadic schema. So there is no contradiction in Plato’s acceptance of both accounts. The two-principle account is an ambitious attempt to explain how mathematical and empirical properties are constituted from ontologically more fundamental factors. Such resultant properties are determinate enough to be definable and knowable, and they are determinate enough to make physical change as such metaphysically possible by functioning as termini in relation to a distinct *subject* whose precise nature is to be able to uphold or sustain them both, but only *in turn*. It would not in my view be deeply unPlatonic to say that such a subject is entitled to be called a substance (cf. *Categories* 4a10-20). This is because from the Platonic perspective the contraries considered as products of the Limit and Unlimited are undoubtedly real (in discerning them in relation to their principles we engage in ontology, not in mere analysis of concepts arrived at by abstraction); but on this level (or by themselves) the contraries are not yet able to do what they ultimately by nature are supposed to do, namely exclude each other! It has to be true that they do exclude each other, since scientific taxonomy knows them as mutually exclusive. It is also true that such contraries are, when instantiated, instantiated in perceptible objects, and that many of them are perceptible themselves. But considered just

¹⁵ Cf. Cherniss, 90 – 91.

as products of Limit and the Unlimited all that they are is objects of intellection. So if these beings and knowables are to achieve (metaphysically speaking) their fullest or final level of reality, and contribute to the life of the physical perceptible cosmos (hardly a trivial matter to the author of the *Timaeus*), then for each range a subject is needed that necessarily rejects one when it accepts the other; and what can be more substantial than a subject that gives life and function to the intelligible and definable?¹⁶

(6) The distinction of levels means that there is no discrepancy between the Plato of the *Phaedo* passage and the Plato of the *Philebus*. But we still have the puzzle of explaining why, given Plato's two levels, Aristotle writes in *Physics* I. 9 as if the Platonists recognize just one schema of coming-to-be, the dyadic one. More particularly, his complaint against them must be that they insist on applying it to just the area which, on a correct or anyway Aristotelian understanding, requires to be handled in terms of the three factors, form, privation and distinct *hupokeimenon* - in other words to the area of physical, empirical, coming-to-be. For Aristotle can hardly complain about their use of the dyadic framework in areas where, as was argued in paragraph 3, the triadic one is unavailable. Now, given that both schemata appear in Plato's writings, and given that they relate to different levels, one might conclude that Aristotle's criticism in *Physics* I. 9 is unfair, perverse, or confused. But this is not an inevitable conclusion. Instead, the situation may be that certain Platonists, perhaps including Plato himself at some stage, developed the ambition of conceptualizing all coming-to-be at every level in terms of a single set of principles, perhaps for the sake of theoretical simplicity and unity; and that for some reason they chose the two-principle model as their candidate. From now on I shall assume that this is how it was. On that basis Aristotle has a reasonable complaint if the dyadic model fails for physical coming-to-be.¹⁷

(7) But is it so clear that it does fail, at least for arguably the most important type of physical coming-to-be, namely genesis of natural substances? In the triadic account in the *Phaedo* the examples are of change from one quality or size to another. In many such processes, both *termini* are equally positive determinations, or neither is obviously more positive than the other. This is not the case when a substance comes-to-be. Here, the natural (direct) way to characterize the from which is as absence of the to which.

¹⁶ See the references in note 19.

¹⁷ Their use of it to explain sublunary coming-to-be is Aristotle's target in *On Generation and Corruption* II. 9, 335b5-24.

Changes in quality to some given quality, say green, can and do have different positive starting points: white, red, yellow, etc. This is why a particular change to green is properly specified only when we also specify the *terminus a quo*. The same holds for changes of quantity and place. The journey from Thebes to Athens is quite different from the journey from Syracuse to Athens. But the ‘journey’ from not being, to being, a fully formed dog or oak tree is always of the same nature because in each case the journey always has the same sort of starting point. And what is salient about the thing at the beginning of the process, whether foetus or seed, is that (a) it is *not yet* a dog or an oak tree, and (b) it *comes from* an adult dog or oak.¹⁸ It would seem that to characterize the process one need mention only the form of a complete member of the species and the absence of this complete form. So these cases lend themselves to dyadic analysis – so much so that Aristotle’s efforts in I. 7, 191a7-19 to extend his triadic account to the coming-to-be of substances may begin to look rather artificial. The Platonists, it seems, could reasonably say that even on the level of natural coming-to-be, dyadic analysis trumps the triadic one, given the centrality of natural *substances* (as distinct from qualities, quantities, etc.) to all parties in the debate.¹⁹

(8) These considerations would help explain why, if the Platonists sought a single model of coming-to-be, they would have embraced the dyadic account. For we need a reason why, in their quest for unitary explanation, they opted for dyadism rather than triadism across the board. One might, after all, manage to persuade oneself (see paragraph 3) that a triadic scheme is discernible in the ‘genesis’ of a set of determinate contraries from the Unlimited, at least if sense could only be made of the timeless transition – and perhaps the Platonists had faith that it could. Thus I think it is worth asking why, if they wanted a

¹⁸ Something like this might also be said about the qualitative example by which Aristotle clarifies his triadic proposal, the uneducated man becoming educated (I. 7, 189b34-190a31). The *terminus a quo* is saliently privative, and the *ad quem* reproduces the knowledge-form possessed by the teacher (see III, 202a9, with δίδαξις as the prime example throughout 202a31-b22).

¹⁹ The line of thought in this paragraph was prompted by comments from Diana Quarantotto. It may help explain why the Platonists were willing to concede that sense-perceptible human beings etc. *are* substances (see *Metaphysics* VII, 1028b18-21; 1029a33-4; XII, 1069a30-32). The concession would have given them a weapon for attacking Aristotle’s general attempt to prise apart substrate and privation: for the attempt is obviously doomed if it fails for the central case of natural substances. For an Aristotelian response see paragraph 25.

single model, they didn't prefer the triadic. Well, one difficulty is that a fully triadic reading in the case just mentioned would give us the set of contraries twice over, so to say. This can be seen by trying to construct an analogy with Aristotle's account of physical genesis. Here we have (a) the matterless form of the statue as *terminus ad quem*, and then (b) the materiate sensible statue (not principle, but product) that reflects that form in its shape etc. So analogously on the metaphysical level there should be (a*) something like the sheer form or Idea of the set of contraries playing the part of *what* the Unlimited 'seeks' timelessly to become, and (b*) something analogous to the materiate sensible statue. Now to unpack the difficulty. (i) It is natural to explain the *per se* indeterminate Unlimited, e.g. of acoustic higher and lower, as the genus of which the contraries are species (cf. *Philebus* 16c – 19a; on genus as matter see *Metaphysics* V, 1016a25-28; 1023b1-2; 1024b8-9; VII, 1038a5-7; VIII, 1045a33-35; X, 1058a23-24; cf. *Physics* II, 200b6-9). So (ii) it is natural to accept in general the converse point, i.e. that the contraries are species of the indeterminate Unlimited. And (iii) it is natural to see this as a definitional fact about them: the contraries are essentially species of the generic Unlimited. But then (iv) this definitional fact must hold of the set of contraries even in its role of terminal form or Idea. A terminal form is definable if anything is. But (v) in that case what is the analogue of the materiate sensible statue, the product of becoming? It was supposed to be the Unlimited considered as 'converted' (by the power of the Limit) into a set of determinate contraries. But this determinately differentiated Unlimited is nothing other than the set of contraries itself viewed as species of the Unlimited. Hence (vi) the set of contraries viewed as species of the Unlimited functions both as the form, i.e. *terminus ad quem*, that 'guides' the metaphysical 'process', and as its result or product. This absurdity results from trying to impose the triadic model at this level. Aristotle can use the triadic model for physical change because here the form *can* appear twice over, both as *terminus ad quem* of coming to be and then as informing the matter in the actualized product.²⁰ This is because this matter is *not* the genus of which the form is a species— it is not an element of the form's definition – and also because temporal differentiation allows for earlier and later contributions by the form. This argument shows that if the Platonists wanted a single scheme of principles for all kinds of genesis it could not be the triadic scheme. On the intelligible level they could not give up their two principles: the matter-like undifferentiated one, and the determining form.

(9) I turn now to the Receptacle. At *Physics* IV. 2, 209b11-13 (cf. b34-210a3) Aristotle says that Plato in the *Timaeus* identifies $\chi\acute{\omega}\rho\alpha$ (= place or space, another designation for the Receptacle at *Timaeus* 52a8

²⁰ For more on this point see paragraph 25.

and d3) with matter. Certainly no such explicit statement appears in the *Timaeus*, and some scholars have thought the identification so plainly incoherent that Aristotle could only have ascribed it to Plato from confusion or perverse intention.²¹ But others have argued that some sort of merger between the notions of *χώρα* and matter is not such a gross confusion after all.²² So whether the *Timaeus* implicitly assumes this merger, or Plato later on sanctioned it for the *Timaeus*, or Aristotle was the first to read it into the text, it is not certain that any of these intentions injected disastrous confusion. However, I do not think that anything relevant for our present passage, *Physics* 191b35-192a25, hangs on deciding such questions. The situation is this: Aristotle here presents a contemporary approach, related in some way to the Receptacle-theme of the *Timaeus*, that fails sufficiently to distinguish the role of matter on the one hand and that of non-being or privation on the other hand; and he is anxious to show that his own approach is genuinely different on this point. We can understand his concern and the way he works it out without having precise views on who said what and when, historically speaking.²³

(10) Let us note some differences between the Receptacle-motif in the *Timaeus* and the account which Aristotle is opposing here. (No doubt the differences too raise interesting historical questions about sources and influences, but I shall not try to pursue them, because - as before - our understanding of Aristotle's concern in Argument 1 does not, in my view, depend on answering them.) The first difference lies in the fact that in the *Timaeus* (as its evidence overwhelmingly suggests) the Receptacle is brought in not to help explain every process of coming-to-be, but for the narrower task of explaining the genesis of the four corporeal elements, earth, fire, water and air.²⁴ The Receptacle only appears in the cosmology

²¹ On the different interpretations see Algra, ch. 3.

²² E.g. Zeyl 2000, lxi – lxiv; Johansen 2004, ch. 6; Zeyl 2010, 117-130; Sattler, 2012. If 'matter' meant only the *hupokeimenon* of all the materials collectively (a sort of medium in which they appear) there would be no difficulty. It is more problematic if, as Aristotle says, 'matter' means something constituting each parcel of fire and water etc., since then we have parts of *χώρα* moving about in *χώρα*. This may be implied by *Timaeus* 51b. Aristotle's interpretation may also rest on a misunderstanding of τὸ μεταλαμβάνον . . . τοῦ νοητοῦ at 51a7; cf. *Physics* 209b12-13.

²³ For detailed discussion see Cherniss 1944, ch. 2.

²⁴ See Broadie 2012, ch. 6.

(see the ‘second beginning’, 48a7-b3; e1) at the point where Timaeus has just broken off from discoursing on the ‘craft-works of Intelligence’ (47e7 ff.) and turns to the basic corporeal materials. Up to now we have been shown the Demiurge and his ancillaries crafting various organic structures out of the materials, which were in disorder before construction of the cosmos began (30a4-5). So far their pre-cosmic presence and availability, and indeed their natures, have been taken for granted. The focus now shifts to the question of what these materials distinctly contribute to the realization of the organic structures²⁵ (the material contributions are called ‘the effects of necessity’ at 47e4-5). In pursuing this inquiry, Timaeus does not merely investigate the natures of the four considered as in the raw (or, as he puts it, the natures and properties they each possessed even before the ordered cosmos came into being, 48b3-5; cf. 52d3-4; 53a7). He also, in fact first, turns his attention to the question of how these corporeally primary elements *themselves* came, or come, to be: for they do have an origin, but no one so far has shown what it is (48b5-c1). And it is at this point that the Receptacle is introduced as matrix and supporter-in-being of the four elements specifically (49a6-51b6) and also as somehow responsible for the separative movements whereby they tend to occupy different regions (52d4-53a7). It is never said with any precision that the Receptacle is a principle in literally every process of coming-to-be, e.g. of plant from seed, or foetus from sperm and formed offspring from foetus (discussed at 91a1-d5), or blood from food ingested from outside the body (discussed at 80d3-81a2).²⁶ By contrast, the position which Aristotle confronts in 191b35-192a25 seems meant to cover *all* coming-to-be, or perhaps all that does not depend on human agency.

(11) A related difference between the Receptacle-motif and Aristotle’s target in Argument 1 is this: the principle of the Great and the Small belongs at a higher or more general level than that of the genesis of

²⁵ These include the cosmos at large, since it is a living being (30b; 34b ff.).

²⁶ It is true that the Receptacle is said to be receptacle and as it were nurse of ‘*all* becoming’ at 49a5-6; e7; 50b6 - c2; e5; 51a4-7; cf. 52b1. But the universal reference is either confined to the four elements or, if unrestricted, is due to the fact that the elements are constituents and necessary conditions for all organic phenomena. In the latter case the Receptacle is not a metaphysically immediate principle of every sensible phenomenon in the way it is of the four elements. See also 51a1-3 (with Cornford’s emendation of line 1); 52d4-5; 88d6.

sensible entities, including even the four elements.²⁷ The Great and the Small was postulated as material principle (or something analogous) for the timeless and eternal generation of the numbers – whether mathematical or ideal numbers – by the One. Then various species of it were distinguished: the long and short for lines, the broad and narrow for surfaces, the deep and shallow for solids (*Metaphysics* I, 992a10-13; XIII, 1085a9-12; XIV, 1089b11-14). These types of magnitude too may have been variously understood as mathematical or ideal. The three-dimensional ones could be seen as being, in some way,²⁸ predecessors of sensible or physical objects; cf. *Metaphysics* VII, 1028b18-27.

(12) In trying to make out Aristotle's target in Argument 1 in the light of these differences, we can speculate whether the Timaeian motif of Receptacle as matrix of the four materials was the origin of a more abstract Academic notion of the Great and the Small as matter for the numbers, or whether instead Plato came to the Timaeian picture from a pre-existing theory of the principles of numbers and other incorporeals.²⁹ But, again, details of the historical evolution of Aristotle's target may make no philosophical difference to our grasp of what concerns him here and how he argues in response. Did the Platonists want just one set of principles for all coming-to-be? Or analogous ones for coming-to-be at different levels (cf. 188b30-189a9)? Or did they take the principles operative at the most fundamental Platonist level and use these as somehow emblematic of coming-to-be in general? Or were they simply undecided between these options, or did some endorse one and some another (not to speak of different ones at different times)? Or is Aristotle's target a sort of abstraction skimmed or constructed by him from variants – an umbrella '-ism' (as in 'idealism', 'expressivism', 'utilitarianism', etc.)? No doubt the most

²⁷ See especially *Metaphysics* I, 987b14-988a15, with Ross 1924, vol. I, 165-177 and lvii-lxxvi. See also Ross's commentary on Theophrastus, *Metaphysics* 6a15-b17 (Ross and Fobes 1929, 50-59).

²⁸ 'In some way' is meant to allow for the difference between Xenocrates who derives everything from a single set of first principles, and Speusippus for whom there are independent principles for each level of object (numbers, magnitudes, sensibles), although he might have recognized a scientific or conceptual order of priority (Aristotle, *Metaphysics* XIII, 1090b13-20; XII, 1075b37-1076a3; Theophrastus, *Metaphysics* 6a15-b17).

²⁹ *Timaeus* 48b5-d1 points to the notion of a principle or principles 'of everything', but refuses to discuss either them or the number of removes between them and the corporeal elements. The passage also says nothing on whether one of these ultimates is a matter-like principle analogous to the Receptacle. On the difficulties see Cherniss 1944, ch. 2, and Steel 2012, esp. 191-200.

positive stance to take on this issue is that the target as Aristotle represents it is all that he needs for making his main point in Argument 1. At any rate I shall proceed on this assumption. His main point and objection against the view is simply that it assumes two principles where three are necessary. In this he adheres to the theme that has already organized so much of his discussion in *Physics* I, i.e. the question ‘How many principles are there?’ (184b15 ff.; 187a12 ff.; 189a11 ff.; b11-29; 190b10-191a22; 192b3; cf. a34-5).

(13) One aspect, however, of Plato’s Receptacle-account may tend to obscure its affinity with the target of Argument 1. The Receptacle-account runs from 49a to 53a. Its main concern is with just two principles of coming-to-be, and their offspring. But part of the passage seems to indicate a triad of principles similar to Aristotle’s three. This part, 49b–50a, comes near the beginning. Plato introduces the Receptacle by emphasizing how the four materials seem to be caught up in a cycle of mutual transformations. They all, it seems, continually turn into each other through processes of solidification, melting, dispersal, conflagration, gathering, quenching, and packing together (49b7-c7). This is supposed to be obvious from experience, although afterwards we learn that initial appearances were misleading: earth, because of the triangle-geometry of its particles, cannot be part of the cycle (54b5-d2; cf. δοκοῦμεν, 49b8; ὥς φαίνεται, 49c7; cf. οὐκ ὀρθῶς φανταζόμενα, 54b8, harking back to ἑκάστων φανταζομένων at 49d1). Even so, the other three do inter-transform: water becomes air, air becomes fire, fire becomes air again, and air in the form of cloud and mist becomes water. So one might get the impression that the Receptacle-passage presents (a) that which in any given case is coming-to-be (i.e. the *terminus ad quem*), say fire; (b) that stuff, say air - a sort of contrary, hence a privation, of fire - which turns into fire; and (c) the underlying and persistent Receptacle. This triad looks remarkably like the Aristotelian one (if for the moment we put on one side Timaeus’s paternal formal principle).

(14) Even so, the Receptacle-passage is not centrally *about* the transformation of the materials. This is not its topic-for-study and *explanandum*.³⁰ The focus on transformation is a preamble. The main body of the passage (50b-52d4) is not concerned to explain how a portion of fire, air, etc. serves as a source, i.e. principle, for the next element in the cycle, or how these materials come into being *from* one another in the Receptacle. Instead the Receptacle-passage mainly presents just two principles, the paternal forms, changeless and intelligible, and the maternal Receptacle. The four empirical materials are shown simply

³⁰ Such elemental transformation is, of course, the *explanandum* of the geometry-passage, 53c ff., on which see paragraph 16.

as offspring of these two – as what the two principles are principles *of* (50c7-d4). The materials are images of the forms, and these images successively come into and go out of *the Receptacle* (50c4-5; cf. c1-3; e1; 49e7-50a1). After 49e the passage never returns to the idea that the materials pass away into and develop out of *each other*.³¹ Instead, the stress is on their collective and wholesale dependence on the two metaphysical principles. Moreover, although portions of diverse materials show up in a time-like sequence relative to each other, there is no suggestion that the father- and mother-principles first generate one portion of stuff and then another; the metaphysical generating seems to be of the entire spread and series of the materials considered as a collective offspring.³² The genesis of the materials is thus on a par with the eternal genesis of numbers or ideal numbers through co-operation of the One and the Great and Small, or the genesis of determinate contraries discussed earlier.

(15) So the main topic of the Receptacle-passage is not the elements considered as, severally, a source or principle for the next member of the cycle. The main point, rather, is their collective status as metaphysical products of metaphysical principles – specifically, just *two* metaphysical principles, the trans-natural forms and the trans-natural Receptacle. So we are not wrong to think that Aristotle's target in 191b35-192a25 is a theory of the same type as we find in the Receptacle-passage. The Receptacle theory has the same structure as the doctrine which Aristotle ascribes to Plato at *Metaphysics* I.6:

... it is evident from what has been said that he has used only two causes, that of the essence (τοῦ τί ἐστὶ) and the material cause (for the forms are the cause of the essence of all other things, and the One is the cause of the essence of the forms); and it is evident what the underlying matter is, of which the forms are predicated in the case of sensible things, and the

³¹ See the image of gold moulded and re-moulded at 50a4-b6: this is not an appropriate illustration of one thing coming-to-be from another in the natural course of events.. A moulded triangular shape does not itself turn into the next shape; the craftsman (τις, 50a1) fashions one shape to replace another.

³² Consequently, in allowing earth to feature in the Receptacle-passage despite its later exclusion from the cycle of transformations, Plato is not cheating or caving in to the influence of the Empedoclean four elements: for although earth cannot be the *physical* offspring or progenitor of any of the other three, all four are on a par in being metaphysically generated from the same pair of parents. As Plato must have been aware, placing earth on its own outside the cycle of transformations is exactly the kind of move that, in an earlier tradition, would have proclaimed that earth is somehow the ultimate first principle of everything. Plato shows that this whole way of thinking is obsolete by making empirically indestructible earth no less metaphysically dependent than its empirically destructible siblings.

One in the case of forms, viz. that this is a dyad, the Great and the Small (988a7-14, Ross's translation; see also *On Generation and Corruption* II. 9, 335b5-24).

(16) In light of this one may wonder why Plato chooses to start the Receptacle-passage with a preamble about the transformations of the materials (49b7-c7). But it would be a mistake to treat this preamble as merely introducing the Receptacle. Rather, it launches the whole enormous topic of the basic inanimate materials of the cosmos, an exposition which closes only at 68d. The topic as a whole has, as I see it, two basic pillars: one is the Receptacle (48e-53a), the other the elemental geometry (53c-56c). The Receptacle-pillar gives a *metaphysical* foundation to Plato's cosmology (more on this in paragraph 17), while the elemental geometry is fundamental from the point of view of *natural science*.³³ The geometry helps make sense of many empirical phenomena, whereas the metaphysical paternal form and maternal Receptacle are barren of empirical explanation. In part, the preamble on transformation looks forward to the geometry, since the geometry will be what explains in detail how the transformations take place. On the basis of the geometry Timaeus states that the triangles of the water-particle can *come to be* reconstituted as portions of fire and air, and those of air as portions of fire; and that air *comes to be* from fire and water from air (for forms of γιγνέσθαι linking one corporeal element to another see 56d5-e2; 57a6; b3; b7). On the same basis he shows these processes proceeding through actions of 'cutting', and 'breaking up' by one sort of particle on a mass of some other (56d1 - 57b5; 58e2).³⁴ This is a naturalistic and physical story: physical because pure geometry cannot account for actual *recombinations* of triangles.³⁵ In sum, the geometrical account shows real generative work being done by the natures of the

³³ It is worth underlining the distinctness of these accounts, since many interpreters have laboured to integrate them by claiming to find hints of elemental geometry in the first one and hints of the Receptacle in the second. The hints of elemental geometry in the Receptacle are tenuous, to say the least; and the Receptacle has no role in the geometrical transformation theory. It is invoked at 57b7-c6, but only to explain, by its 'shaking', the *locomotion* of particles of each kind into large homogeneous masses. However, the accounts are certainly not alternatives - their contributions are complementary - and they are not oblivious to each other: see the backward reference at 54b5-4, carefully prepared for at 49b8; c7; d1.

³⁴ See also εἰς ἀλλήλα διαλυόμενα earlier at 54c4 ff., where geometrical structure explains not so much how the transformations actually occur, but how from a geometrical standpoint they are possible.

³⁵ The polyhedra of pure geometry are only notionally composed of triangles. From the point of view of pure geometry it makes no sense to ascribe to such triangles numerical identities through time such that these or

materials, i.e. their particles, *themselves*. For all its *a priori* status the geometrical account is a postulate of natural science straightforwardly parallel to Aristotle's equally *a priori* elemental transmutation theory in *On Generation and Corruption*. The geometrical account is part of natural science, not metaphysics.³⁶ Plato does not label this distinction, but his language and imagery in dealing with the particle-theory and in dealing with the Receptacle show a clear sense of the difference between trans-natural and natural generation.³⁷

(17) Even so (to return to the question at the beginning of the last paragraph), the initial picture of elemental transformations is important for the metaphysics of the Receptacle. It highlights the instability of the elements and stirs up a sense of bemusement as to whether the names we give them name anything

those form surfaces of this polyhedron, then that. At 53d5-6, κατὰ τὸν μετ' ἀνάγκης εἰκότα λόγον reminds us that this is a λόγος of physics, hence only εἰκῶς albeit constrained by demonstrable geometrical necessities.

³⁶ The particle-theory features at least four sets of relationships in which one thing stands as principle to another: (i) regular-solid particles to different regular-solid particles (56d6-57b7); (ii) basic to non-basic triangles (53c8-d5); (iii) triangles as constituting regular solids (54d5-55c4); (iv) different types of regular-solid particles as explaining variations in mobility and stability among the elements (55d – 56b), and also explaining (when like-natured particles clump into masses) certain qualities of the elements as experienced by us. E.g. the sharpness of the tetrahedron, which is the στοιχεῖον καὶ σπέρμα of fire (56b4 – 5), causes the sensation of burning (61d5 -62a5). Some of the explanations in category (iv) feature the cubic earth-particle; but this is fine because the principles in (iv) are not about the cycle of transformation. The cubic shape of the earth-particle explains both why earth is absent from the cycle and why earth has its well-known earthy properties (55d8-56a1). All the relationships in (i-iv) belong under geometrized natural science, not metaphysics.

³⁷ While I have stressed the difference between the metaphysical genesis of elements in the *Timaeus* and their physical transformations as particles, it must be noted that the particles themselves are said to have had a trans-natural origin in God's imposing shapes, numbers, and proportions on pre-existing mere unordered 'hints' (ἴχνη) of fire, water, earth, and air (53a7-b6; 56c3-7; 69b2-c1). This is not simply an alternative to the story of the four as engendered in the Receptacle, because (as Plato tells it) God's fashioning of the particles was a one-off event, whereas the dependence of fire etc. on the Receptacle seems to be ongoing.

reliably identifiable (49a7 –d3). This prepares Plato’s audience³⁸ for the major lesson, which is that the corporeal fundamentals of the natural world are not *absolutely* fundamental. Their empirical instability betrays their metaphysical dependence and derivative nature. The main passage goes on to explain how they exist only as transient qualifications of the Receptacle. This dependence turns out to be linked with another: they are mere imitations of intelligible forms. Plato’s primary message, according to the emphasis that seems to me most plausible, is not (as many scholars hold) that we must postulate the strange Receptacle to complement an already presupposed ontology in which, in general, *everything* perceptible (thus animals and plants no less than the corporeal elements) exists only as a sensible image of a corresponding intelligible form. Instead, the primary message is that now, in the distinctive context of building a coherent cosmology, we must *specifically* and *pointedly* admit forms even for the basic materials of the world (cf. *Parmenides* 130a on fire). That is to say, we must grasp that even these empirically primal sources of everything else that is physical are, in reality, mere images of something non-empirical – metaphysical hangers-on, not principles. In semantic terms this result is the theory that the truly primary and ultimate significates of our names ‘fire’, ‘air’, ‘water’, and ‘earth’ are not the visible and tangible masses themselves, but intelligible forms.³⁹ In this way Plato distances himself from previous theories in which corporeal materials, one, two, or more, are absolutely ultimate realities.⁴⁰

³⁸ Plato assumes an audience sympathetic to Platonism.

³⁹ This is Taylor’s understanding (Taylor, 1928, 333-7). For discussion of the influential alternative interpretation, and reasons for not preferring it, see Broadie 2012, ch. 6, sections 5 and 6.

⁴⁰ Plato’s underlying concern here is, I think, to render it plausible that the four physical elements were amenable to organization by the demiurgic Intelligence. If they are absolutely ultimate realities (as much so as the demiurgic god himself, if indeed for Plato this being is finally ultimate), it is a puzzle how, given the vast disparity of his nature from theirs, the Demiurge could expect them to fall into line for his project (48a2-5; also 46c7-d1 and 68e4-5 where they are called αἰτίαι ὑπηρετούσαι). Given their status as dependents metaphysically fathered by form, it is unsurprising that he prevails on them - by persuasion (48a2-3) - to receive the beautiful new form of the cosmos; and it is also unsurprising that they continue to retain it. The word for the Demiurge’s initial relation to his raw pre-cosmic materials is παραλαμβάνειν (30a4; 68e3), commonly used for receiving an inheritance, i.e. taking possession as of right (LS-J sv.1; cf. Harte, 2010). On this interpretation the Receptacle-account is not metaphysics purely for its own sake (which is not to say it is not genuine metaphysics), but underpins a cosmogony where the remit is production of an ordered world of superlative beauty and coherence (29a2-6; 34a8-b9; 41b7-c2; 68e3-4; 92c4-9). Plato may have seen Anaxagoras as failing to recognize a similar problem of how cosmic *nous* could accomplish the separation. The problem is not that if certain corporeal natures are absolutely ultimate there can be no such thing as a

(18) Finally in this section some remarks on Argument 2 in *Physics* I. 9. I take Argument 2 to begin at 192a27, at ὡς δὲ κατὰ δύναμιν (although see footnote 2). Its logical relationship to Argument 1 is unclear. Perhaps it is in no particular logical sequence to Argument 1, but instead they are co-ordinate reflections on the theme of coming-to-be and passing away. In that case, Argument 2 may have nothing to do with the Platonists in particular. On the other hand, perhaps it was Aristotle's view that they in particular were misled by the logical 'fixity' of the matter in a given episode of coming-to-be into concluding that for every coming-to-be there is a fixed, i.e. eternal, matter or *hupokeimenon*.⁴¹ By the same token they might also have concluded that there is one and the same eternal matter for every coming-to-be. If this was the view of some Platonists, then the difference between them and him is even starker than has fully appeared so far. Not only would they be imposing their dyadic schema on every area of coming-to-be, temporal and eternal alike, but in every area they would be populating the schema with eternal principles. What seems to be a perishable substance, a plant or an animal, would really be a transient configuration of something eternal, and there could be no true scientific understanding of the plant or the animal that did not refer back to this eternal principle (cf. 193a12-28). One reason for thinking that Argument 2 has a Platonist target is that elsewhere (*Metaphysics* 1033a24-b19) Aristotle gives a somewhat similar regress argument which prefaces an attack on Platonic forms (b20-29).⁴² This

strictly incorporeal mind or soul (not that it is clear that Anaxagoras conceived of *nous* in this way). That is a *non sequitur*: there logically could be an incorporeal mind as well as absolutely ultimate corporeal principles. The difficulty is in understanding how, given the stark difference between their natures, the latter should lend themselves to being separated out, and cosmically disposed, by *nous*.

⁴¹ See the comments on 192a27-34 in Section A.

⁴² 'Since anything which is produced (γίγνεται) is produced by something (and this I call the starting point of the production [γένεσις]), and from something (and let this be taken to be not the privation but the matter, for the meanings we attach to these have already been distinguished), and since something is produced (and this is either a sphere or a circle or whatever else it may chance to be), just as we do not make the substratum – the bronze, so we do not make the sphere, except incidentally, because the bronze sphere is a sphere and we make the former. For to make a "this" is to make a "this" out of the general substratum. I mean that to make the bronze round is not to make the round or the sphere, but something else, i.e. to produce this form in something else. For if we make the form we must make it out of something else; for this was assumed. E.g. we make a bronze sphere, and that in the sense that out of this, which is bronze, we make this other, which is a sphere. If, then, we make the sphere itself, clearly we must make it in the same way, and the processes of making will regress to infinity. Obviously then the form also, or whatever we ought to call

argument too is about the ‘fixity’ of form and matter in a given coming-to-be, although the focus is more on form. Aristotle’s point at 1033a24-b19 may be that misinterpretation of fixity helps bolster the doctrine of forms as eternal substantial entities (cf. Ross 1924 ad 1033b19). Thus Argument 2 in *Physics* I. 9 may be making a parallel point against some distinctively Platonist notion of the material principle.

(19) At any rate, Argument 2 is Aristotle’s explanation that positing the matter as ‘fixed’ in the only sense in which we are clearly entitled to do so is equivalent to rejecting the absurdity that something comes to be before it comes to be etc. This rejection, as I understand it, in turn amounts to acceptance of what, no doubt thanks to Aristotle’s work, seems an utter truism: namely, that for any given coming-to-be there must be distinct occupants for the roles (a) of whatever it is that thereby comes to be and (b) of matter. So one point to be picked up from Argument 2 is that something has certainly gone wrong for anyone who draws heavy-duty metaphysical conclusions from the equivalent of that truism. If Platonists or others want a valid route to the conclusion that there is an eternal substrate, they will have to start from premisses which they have no reason to assume would be readily granted. Thus we could read Argument 2 as intended to break down the misunderstanding of any thinkers, materialist or Platonist, who regard it as self-evident that coming-to-be involves eternal principles. If Aristotle thought that the Platonists saw the logical fixity of matter in each single coming-to-be as implying an eternal substrate, he might equally have thought this about the materialists discussed earlier in Book I, who postulated fire or water or some set of more or less empirical elements as imperishable matter for everything else and perhaps even as

the shape of the sensible thing, is not produced, nor does production relate to it, - i.e. the essence (τὸ τί ἦν εἶναι) is not produced; for this is that which is made to be in something else by art or by nature or by some capacity. But that there is a bronze sphere, this we make. For we make it out of bronze and the sphere; we bring the form into this particular matter, and the result is a bronze sphere It is obvious then from what has been said that the thing, in the sense of form or substance, is not produced, but the concrete thing which gets its name from this is produced, and that in everything that comes to be the matter is present, and one part of the thing is matter and the other form. Is there then a sphere apart from the individual spheres or a house apart from the bricks? Rather we may say that no “this” would ever have been coming to be, if this had been so. The “form” however means the “such”, and is not a “this” – a definite thing; but the artist makes, or the father generates, a “such” out of a “this”; and when it has been generated, it is a “this such”.... Obviously then the cause which consists of the Forms (taken in the sense in which some maintain the existence of the Forms, i.e. if they are something apart from the individuals) is useless with regard both to comings-to-be and to substances; and the Forms need not, for this reason at least, be self-subsistent substances (οὐσίαι καθ’ αὐτάς)’ (*Metaphysics* VII, 1033a24-b29, tr. Ross; see also XII, 1069b35-1070a4).

substrate of *every* change; again cf. *Physics* II, 193a12-28. On this reading Argument 2 rounds off the whole discussion of earlier thinkers in *Physics* I.

(20) One might think it would take extraordinary stupidity to postulate an everlasting substrate on grounds that amount to a failure to recognize that in every coming-to-be the matter must be distinct from what thereby comes to be. But the mistake is bound up with a natural way of understanding a basic assumption of science. This is the assumption that the whole of nature is governed by *the same principles* – which for materialists would be naturalistic principles. On a simple understanding this becomes the view that change throughout nature depends on the involvement of a set of ultimate, self-standing, naturalistic *entities* or *things*.⁴³ Since a principle cannot be a principle of itself (185a3-5), these thing-principles of the natural world cannot themselves come into being since nothing is prior to them. So certain naturalistic entities - or perhaps one such entity - are the foundation of all that is, which gives these beings a sort of divine-like and, as we might say, metaphysical status, even though their sphere of influence is the natural world.

(21) If such considerations are in the background of the *Physics* I.9 dialectic, we can see them as evoking two radical responses. One is Platonic, exemplified in the Receptacle-passage and elaborated in other ways elsewhere in Plato. According to this approach, the natural world is not self-standing and nothing belonging to it is finally ultimate. Nature as a whole is the result of a trans-natural coming-to-be from a basis of trans-natural principles. The other response, which is Aristotelian (my present remarks are confined to what has been covered in *Physics* I so far), rejects that identification of principles with *things*. The same thing sometimes acts as a given type of principle and sometimes not - e.g. sometimes it is an agent of change, sometimes a substratum or patient, sometimes it is both at once in relation to different changes – and for all we have seen so far this may be true across the board. However, the two penultimate sentences of *Physics* I indicate that much remains open. They contrast the topics of first philosophy and physics, saying that physics deals with ‘natural and perishable forms/kinds, whereas the question of ‘the form-principle’ (at least as something ‘separate’ and immaterial) belongs to first philosophy. This is a

⁴³ This is meant to include such entities as forces, e.g. Love and Strife. In the present context what qualifies something to be *thing*-like is its being thought of as numerically identical through all its manifestations: it is not merely a pattern abstracted by us from of repeated cases of e.g. combination and dispersal. (The point does not depend on whether the Love and Strife of Empedocles were actually thing-like in this sense.)

reminder that physics is not first philosophy or philosophy of absolutely first principles. For the present, however, it is an open question whether Aristotle's first philosophy will admit incorporeal changeless forms such as the Platonists want, or/and numbers and other mathematical objects, or/and some other kind of incorporeals. And it is an open question whether any incorporeals, if admitted, gain entry because they turn out to be principles of natural phenomena or even of the natural domain as a whole. And with respect to any that *is* a principle it may turn out that this principle is such that the same individual cannot sometimes function as the principle and sometimes not, or - to put it the other way round - that a supra-sensible individual can only function as the principle in question if its entire reality is bound up with fulfilling that principal role. We shall return to this in Section F.

Section C: What does Aristotle achieve in *Physics* I.9?

(22) There are good reasons to include the Platonists in the survey of views in *Physics* I: they offer a definite set of principles; as with previous theorists and Aristotle himself, contrariety is important for them; they recognize a matter-principle, whether or not they use that term; their theory stands in interesting contrast with earlier ones in that earlier ones particularly struggled with the 'not-being' aspect of coming-to-be, whereas the Platonists are confident about including privation in the picture; and finally their theory emphasizes the notions of form and the good, themes which have played no part in the earlier chapters of *Physics* I but will be so important in *Physics* II. On the other hand, when we look at the *arguments* of I.9, we cannot but think that they would hardly scratch the skin of a convinced Platonist. In Argument 1 Aristotle mainly just shows how their set and number of principles is not the same as his. The only polemical moment comes when he points out that contraries are mutually destructive, so that one of the two Platonist principles seeks its own destruction. But, as I argued in the comments on 192a16-25, this begs the question against the Platonists, whether Aristotle is aware of it or not. As for Argument 2: no doubt its aim is to uncover a logical confusion that might have misled some thinkers, including Platonists, to assume for every coming-to-be an eternal *hupokeimenon* - but the Platonists could simply reject the claim that they and all those others hold their view from confusion rather than from clear-eyed intuition. In this section I shall first look further into the issue of question-begging in I. 9. Then I shall point out that even if I.9 taken in the abstract does beg questions against the Platonists, this is unimportant because it is not a defect in the context of Aristotle's project.

(23) In the *Physics* I survey of earlier philosophers Aristotle has several times said that one or another of their moves or positions manifests perplexity, confusion, or the condition of being stuck with having to say something one does not really want to say (185a18; 186a1; 191a23-4; 191b30-33; cf. 185a14, λύειν; 185b25, ἔθορυβοῦντο; 186a23, ἡ λύσις; 190b33, λύεται; 191b10-11 διὰ ταυτῆν τῆν ἄγνοιαν προσηγγόνεσαν). It is noticeable that I. 9 says no such things about the Platonists.⁴⁴ This suggests that their position is not for Aristotle a confused step in the right direction (the goal being a coherent natural philosophy). When Aristotle attributes confusion he generally means that the confused party is blocked from advancing along the path to the truth. When he dispels difficulties that hampered earlier thinkers, he is explaining how they failed to progress along the right road. More generally, when he speaks of facing or solving an *aporia* he has in mind a difficulty the solving of which helps him or would have helped others towards the right result (see e.g. *Physics* III, 211a10-11; IV, 217b29-30; 218a32-b1; *On the Soul* I, 403b20-23; *On Length of Life* 464b21; *Metaphysics* III, 995a24-b4; *Nicomachean Ethics* VII, 1145b2-4; 21; 1146a21-7; b6-8; 1154a22-5; *Eudemian Ethics* I, 1215a3-7; 21-23). Aristotle has little interest in solving problems internal to outlooks or projects in which he has no comradely involvement. It may be that he does not even count something as an *aporia* (an *aporia simpliciter*) if it only arises for an enterprise which he does not in some way share. To apply a familiar pattern: what is an *aporia* to or for this or that person is not on that account an *aporia simpliciter*. For the pattern see e.g. *Physics* I, 184a18 (γνώριμον); *NE* X, 1176a15-24 (ἡδύ); VII, 1153a26-31 (ἀγαθόν) etc.: if the judging subject is in some way defective, what is good etc. to or for her or him is not on that account good etc. *simpliciter*. (Having such a view about what counts as real *aporia* is, of course, consistent with showing, for the sake of *reductio*, that someone else's system generates an *aporia* insoluble within the system.) The point of these remarks is to suggest that the absence of *aporia* -vocabulary from the I. 9 sketch of Platonism is a sign that for Aristotle the Platonist theory is no kind of step in the right direction – the right direction being along ‘the path towards coming-to-be and perishing and change in general’ (τῆς ὁδοῦ τῆς ἐπὶ τὴν γένεσιν καὶ φθορὰν καὶ ὅλως μεταβολήν, 191b32-33). The Platonists are not, in his view, making imperfect progress in an enterprise he shares: rather, their kind of project and his are fundamental different. In such a situation it is virtually impossible for either side to lodge an objection that is not in some way question-begging.

(24) So, whether or not Aristotle realizes the fact, I. 9 fails by itself to achieve any argumentative advantage over the Platonists. But this is hardly a defect in the project of *Physics* I. Before one ever gets

⁴⁴ Cf. Cherniss, 34.

to I. 9 it is obvious from previous chapters what sort of data Aristotle is concerned to explain, and the Platonist dyad, as I shall argue, can do nothing to illuminate those data. What Aristotle centrally aims to make intelligible is the coming-to-be of organisms. He has already spoken of this phenomenon at 187b16 (in connection with growth), at 190b3-5, and at 191b18-20.⁴⁵ His question-begging in I. 9 against the Platonists would be a weakness if by I. 9 it were still unclear just what sort of work a theory of principles is expected to do, i.e. what the desired principles are supposed to be principles *of*. If we do not know what sort of work a theory of principles is expected to do, then for all we know the Platonistic dyad could turn out to be the right theory for the as yet unknown job. But we do know, by the time we get to I. 9, that the job is that of explaining the coming to be of organisms. And, as will be detailed in the next paragraph, the Platonist dyad is manifestly useless for that purpose. Hence although it is true that I. 9 is dialectically ineffective against the Platonists, this truth is of little importance.

(25) A certain biological fact drives a deep wedge between the temporal generation of natural organic substances and dyadic Platonist generation on the purely metaphysical level. This is the fact that natural organic substances typically come into being through action by some cause that is a substance of the same kind. In general, the creature that comes to be is capable of becoming a parent itself. Such generation is an arc that begins and ends with mature generative members of the same species. The generated shares the parent's nature; it is not just called by the same term, or by a derivative version, in the way in which in Platonism the sensible *fs* are so called because they have come to be 'in the likeness of' the form *F*. The Platonist pair of principles was originally meant to explain the dependence of thoroughly non-biological things such as numbers or number-forms on the One together with the Great and the Small, and the four physical elements on paternal Platonic form together with the Receptacle. In such cases there can be no hope of the substrate's becoming so to speak fully invested with the formal principle that acts as both generator and *terminus ad quem*. The *terminus ad quem* cannot be fully attained, i.e. the offspring

⁴⁵ This case is relevant despite the difficulty of the example and possible need for emendation at 191b20-21. The coming-to-be of e.g. water from air is mentioned only once (188a13-17), and then only in the context of pointing out that Anaxagoras gets this wrong. Thus one has the impression that *Physics* I, insofar as it is about substantial natural coming-to-be, is about the coming-to-be of organisms. Aristotle also discusses the coming-to-be of artifacts such as statues at 190a25-b17 and 25-32, but presumably here as in *Physics* II this is a lens for viewing the principles of organic substances.

cannot come to be as ontologically strong as their parents. The indeterminate substrate in the Platonist dyad cannot become a new version of the One capable of generating new numbers etc., or a new intelligible form of fire that generates its own progeny of sensible fire. This is for the simple reason that there can be only one One, and only one intelligible form of fire. The logic of this uniqueness upholds the conflation of matter or substrate with privation of form by ensuring that while the matter persists as a supporting principle of the offspring, the privation likewise never goes away completely. This is because privation here is nothing other than the offspring's essential failure ever to be a father – essential, since to be a father it would have to become *the* father, its own father. So the offspring never frees itself from privation any more than from its matter or substrate. Hence there is reason to treat privation and substrate as one and the same principle. But in the natural and sense-perceptible world, the replicability of things – the possibility of there being different parcels of matter of the same kind, and different instantiations of the same form – allows for offspring that differ from the father not through inbuilt metaphysical inferiority, but through simple numerical difference. The offspring are destined to shrug off privative inferiority completely – or as completely as necessary for them to become parents on the same level as their father, generators of offspring that will accede to the same powers as themselves. The offspring are material beings – but so was the father; the father was an adult, i.e. fully invested by the form, and the offspring will be adult individuals too. Therefore being material does not entail being deficient in the form. Add the fact that the adult offspring's material constituents pre-existed (or have naturally grown out of matter that pre-existed) this individual's birth, and it is clear that there is a single continuous material line reaching back to before birth and persisting on in the new adult, a material line at first deprived of the form and later in possession of (or possessed by) it. Thus it is clear that the material *hupokeimenon* of natural substantial coming-to-be is one thing and privation of the form is another. And this is clear despite the fact (discussed in paragraph 7) that in ordinary discourse it is hard to designate the *terminus a quo* of a natural substantial genesis otherwise than privatively in relation to the form. This seemed a difficulty for the triadic scheme, but the difficulty recedes in light of a fuller analysis.

(26) This Section has been on the question of what Aristotle achieves in *Physics* I. 9. I have argued that while the polemic of this chapter would have been unlikely to move the Platonists, from the Aristotelian point of view this does not matter. It does not matter because a major, if not the central, task of Aristotle's natural science is to study the sublunary life-forms, which are necessarily subject to coming-to-be through reproduction: and this aspect of their nature is, we have seen, unintelligible in terms of the Platonist scheme, whereas Aristotle's triadic formula handles it with no trouble at all. (Even if there are Platonic forms of Man, Dog, etc., it is utterly obscure how introducing them into the dyadic framework would

make it more suitable for the subject-matter in question.) So even if the Platonists remain unrefuted by argument, their perspective is irrelevant to a huge, and in its own terms flourishing, portion of Aristotelian science. Faced with this situation, what might the Platonists say on their own behalf? (a) A sober response would be to accept that there are (at least) two realms of beings, each to be handled in terms of its own type of principal schema. (b) An arrogant response would be: ‘It is as some of us Platonists have always suspected: there is just one type of explanation, the dyadic kind; the accounts it supplies are in terms of intelligibles, whether mathematical or metaphysical; hence only realms amenable to this type of account are scientifically knowable, i.e. “really real”’. (c) A big-picture response would be: ‘Our vision is that in the end everything sense-perceptible is just concatenations of qualities supported in existence by something like the Receptacle.⁴⁶ The whole of nature should be considered a single massive *explanandum*: it is the effect of the forms’ somehow projecting themselves on to an incorporeal characterless medium. Thus the dyadic explanation is preserved and extends to the physical world’. One should answer by pointing out this vision’s complete failure to address the business of explaining the coming-to-be and passing away of individual items *within* the physical world. (d) An ambitious Platonist response would be: ‘We have a programme: we call it the Academy Plan.⁴⁷ It will show, when implemented, how starting from the One, and the Great and Small or Unlimited, one can, by rational steps, preserving throughout the same format of explanation, descend to the level of explaining any given physical phenomenon.’ To this the answer must surely be: ‘Let’s wait for your implementation to see how (whether) its details work out.’

Section D: Limits of Aristotle’s triadic schema

(27) In one domain of physical science Aristotle himself must abandon explanation in terms of the privation-form-*hupokeimenon* triad. This is the domain where everlasting or eternal things are explained by reference to other such things. The approach needed here is not in conflict with the triadism defended in *Physics* I. The fields of application are different. The latter applies to temporal comings-to-be, or to things (substances, qualitative conditions, etc.) that have being only through having come-to-be in a temporal sense; the former to phenomena of change that never came to be in a temporal sense but

⁴⁶ The ‘offspring’ in the *Philebus* too are in the categories Quality and Quantity, e.g. health, music, seasons, physical beauty and strength, ‘and many, many truly beautiful states of soul as well’, 25d7 - 26b7.

⁴⁷ Comparable in ambition to some contemporary naturalist programmes such as the Canberra Plan.

nonetheless require to be explained. Aristotelian examples of phenomena that never came to be from not-being are (a) the endless series of sublunary *geneseis* and *phthorai* considered collectively, and (b) the eternally continuous movements of the heavens. (The endless sublunary series is due to the individually endless movements of the celestial spheres – or of, rather, the first or outermost sphere plus the sphere-system that accounts for the annual movement of the sun – which in turn depend on the incorporeal unmoved mover or movers.) Phenomena under both (a) and (b) are effects of causes (indeed, agents or efficient causes), but these phenomena, by definition of ‘endless’ and ‘eternal’, do not replace either their own absence or the privation of some *terminus ad quem*. (A finite change whereby *s* becomes *F* involves (i) *s*’s prior lack of *F* and (ii) the prior absence of that change itself.) About the endless series of sublunary *geneseis* one might say that there is nothing remarkable in its failing to fit the *Physics* I triad since it is not a change but a series of changes each of which does fit the triad. On the eternal movement, matters are less clear. Aristotle always calls this a *kinesis*, but because it is necessarily unbroken it would seem that explaining it means explaining it as somehow a whole. As an *eternal* whole it neither replaces a privative *terminus a quo* with a positive *ad quem* nor occurs after not occurring (as does triadically structured change).⁴⁸ But even here Aristotle gives the triad the best possible run for its money. He wants to treat the eternal and essentially unbroken celestial rotations as in some sense involving individually transient stretches each with its own *a quo* and *ad quem*; thus the spheres, considered as *hupokeimena* of these notional stretches, are possessed of ‘topical matter’, i.e. the potential at any given moment to be, part by part, somewhere *else* along the circuit (*Metaphysics* XII, 1069b25-26; VIII, 1042b5-6; IX, 1050b20-22).⁴⁹ But there is no suggestion that the overall motions of the spheres are to be *explained* as resulting from an infinitely repeated stringing together of successive distinct stretches of finite, transient, motion each with a prior explanation of its own. The sole *explanandum* in the case of each sphere is its motion considered as numerically one and eternal.

⁴⁸ Thus we have the problem, discussed since antiquity, that eternal motion does not conform to the *Physics* III.1 definition of κίνησις/μεταβολή as actuality of the non-*F*’s potential to be *F*. Aristotle seems not to notice any difficulty this creates for his argument to the incorporeal unmoved mover, which rests on applying to the eternal case the principle that every κίνησις depends on a κινουῦν.

⁴⁹ See Charles, 2000, esp. sections 5 and 6; also Fazzo, 2013 for a probing discussion relating 1069b26 to the ἀπορία at *Metaphysics* III, 1000a6-7 (‘Whether the principles of perishable and those of imperishable things are the same or different’) and to Aristotle’s concerns at 1075a25-34.

(28) In the Platonist dyad the privation never suffers complete replacement by its opposite, the form. The *hupokeimenon* never disentangles itself from privation, which is why it and privation are not distinct principles. This feature, I shall argue (paragraph 32), is reproduced in the eternal motion of Aristotle's spheres. Moreover, understanding this feature will shed light on the well-known puzzle concerning the causality of Aristotle's prime mover: is the mover the efficient cause of celestial motion, is it the final/exemplary cause, or is it both? And if both, why the apparently pointless duplication of types of causality? For background to these questions, let us look again at the Platonist structure examined in paragraph 25, contrasting it again with sublunary organic coming-to-be involving the three principles. In the sublunary realm I shall focus on the coming to be of new organic substances.

(29) The sublunary parent as efficient and form-bearing cause acts on the matter, starting a process by which the not-being of the new substance is replaced by its being.⁵⁰ The parent is also exemplary of what the new substance should be. The new substance can grow up to become another such parent, an efficient cause and exemplar of offspring in its own right. But the fact of its attaining the same status as its parent does not make it any less derivative from its parent. It is derivative in that its genesis came about through the parent's form-bearing action on matter previously devoid of the form and unable by itself to take on that form. Thus, central to our sense of the offspring's derivativeness is its existence now as something that *was-not* or *has not-been*. But while it is necessarily *derivative from* a parent, it is not necessarily *dependent on* a parent. Its coming into being did depend on the parent, but its being, now, is independent of the parent's. So the parent can perish and in a way be replaced by its offspring. In the Platonist scenario, by contrast, where paternal form eternally generates eternal or everlasting offspring in an eternal matrix, the offspring's derivativeness in relation to the form is not grounded in its having been brought to be from not-being through parental intervention on unformed material. So the offspring's derivativeness from the form has to be understood as a kind of perpetual dependence on it and inferiority to it. The form

⁵⁰The physical or temporal (as distinct from merely logical or mathematical) before-and-after of this is very clear in the summary of the four causes at *Physics* II, 198a21 ff. At 33-35 Aristotle says: 'When it comes to *becoming* (περὶ γενεσέως), this above all is how people inquire about the causes: they ask what happened after what, and what was the first maker, and what the thing had done to it, and similarly what the sequel was at each stage'. The emphatic position of περὶ γενεσέως is missed in Charlton's translation. The phrase is emphatic because at 27-31 Aristotle has just drawn a contrast between moved movers and the absolutely (cf. 198b2) unmoved movers that are not subjects of physical science, and has stated that there are three fields of investigation: immobles, things that move but are imperishable, and things that perish.

cannot be superseded, and the offspring cannot emerge into detached existence unsupported by the father. So far as the offspring does exist, its existence is an endless becoming. It is the substrate's unachievable aspiration to be, itself, the necessarily unique paternal form.

(30) Conversely, the Platonist paternal form causes the existence of the offspring simply by being what the substrate endlessly aspires to be. So we have here a sort of blurring of efficient – ‘paternal’ - causation with exemplary or final causation.⁵¹ In *Physics* I. 9 Aristotle finds fault with the Platonists for their inability or refusal to disentangle *hupokeimenon* from privation. But this non-distinction is intimately connected with another one: between efficient and final causation. For the roles of efficient and final cause are most obviously different when the efficient cause is actual and actually operative and its end not yet actualized but *actualizable*. But this situation implies that, when the efficient-causal process is not interfered with, the substrate will leave privation behind and take on the form. Conversely, I suggest, the case where the substrate always and necessarily coincides with privation is a case where efficient and final cause cannot be pulled apart. In short, a dual merging, of privation with subject-hood and of efficient with final cause, is a necessary feature of causation by the eternal of the eternal. Clean separation, in both cases, is possible only for transitory substances and transitory changes.

(31) But these mergings are not confined to Platonism. We find them in Aristotle too, in his explanatory approach to eternal celestial motion. Aristotle notoriously appears to shift position on whether the *cause* of this motion - the incorporeal unmoved mover - is an efficient or final/exemplary cause. At *Physics* VIII.10 it appears to be merely efficient, and efficiency seems to be suggested at *Metaphysics* XII. 6, 1071b13. But in *Metaphysics* XII. 7 the mover is very clearly a final or exemplary cause, and (in contrast to *Physics* VIII) its goodness, desirability, and divinity are a major theme (1072a26-b4; b14-30). But also in *Metaphysics* XII. 7 Aristotle proves the mover's incorporeality (more precisely, its having no magnitude) by the argument he used in the *Physics* (1073a5-11; cf. 267b17-26). Thus it would seem that

⁵¹ On a familiar understanding of ‘final cause’ or ‘that for the sake of which’ (in the sense of τὸ οὗ ἕνεκα τινός, *Metaphysics* XII, 1072b1-3), that for the sake of which *X* obtains is something that normally comes to be through *X*'s obtaining. In this sense an exemplar is not a final cause. Here, however, I follow many interpreters in taking ‘final cause’ to include any object or objective *Y* that explains the obtaining of *X* in a way that makes essential reference to the good of realizing or conforming to *Y*.

anyway in *Metaphysics* XII. 7 the unmoved mover is both efficient and exemplary cause.⁵² However if the present exposition is on the right track, it should be no surprise that Aristotle wants to have it both ways.

(32) Also consider the *effect* or ‘offspring’ of the incorporeal unmoved mover of *Metaphysics* XII. 7. It consists in the everlasting motions of the spheres. But the spheres are only notionally distinguishable from their motions, because their motion-activity is their life or the necessary expression of their life. They must be alive, since the respective movers (or perhaps only the primary mover) are objects to them of ἔρωϛ, a passionate longing translated into or given expression by their circular movements (1072b3; 1072a26-29).⁵³ And since life for the living being is its existence, the very being of the spheres - not merely their notionally distinguishable motions - is the effect of the incorporeal movers. If our analysis above is a guide, we should expect the dependence of the sphere-in-motion on its cause to appear as a kind of inferiority, and this is surely what we find in *Metaphysics* XII. 7: the sort of inferiority whereby the subject is what it is through its unsatisfiable longing for (i.e. to be) the originator. With the spheres this desire manifests itself as perfect (uniform, circular, necessarily unbroken, inexhaustible) physical motion, something that copies as fully as anything physical can the life of an incorporeal being whose entire substance is the activity of thinking. But this motion or life of the spheres, while physically perfect, is metaphysically imperfect because it falls short of the activity of the incorporeal mover: and the spheres’ ‘failure’ in this respect is essential to their very being. In other words, the subject of this motion cannot emerge from the privation that grounds the motion. We have here exactly the Platonist dyad of principles that Aristotle opposes in *Physics* I.9.

(33) It has often been remarked that if the unmoved mover of *Metaphysics* XII.7 is only a final cause and exemplar it need not, as we say, ‘really exist’: all that is necessary for explaining celestial motion is that such a being figure as an ideal to the spheres, and for this it need be no more than an intentional object of

⁵² For recent discussion, see Judson, 1994, 164-7; Graham, 1999, 177-80; Berti, 2000, 186-8; 205-6; M. Frede, 2000, 38-47; Laks, 2000, 240-43; and Menn 2013, Part III gamma i., for a particularly penetrating and wide-ranging treatment.

⁵³ How their mental activity relates to their motion is a question on which Aristotle gives no guidance. For a suggestion see Broadie 2016, paragraphs 20 – 22.

their thinking and desire.⁵⁴ This line of thought strongly suggests that if *per contra* Aristotle holds that the unmoved mover ‘really exists’, he is looking upon it as also in some way an efficient cause. Otherwise its real existence is redundant. And it is repugnant to suppose that a being that we know of only as a theoretical postulate, and whose place in our theory is that of the absolutely primary principle, should have anything about it that is theoretically redundant. In general, an originator’s efficient causality (or the need on the part of the *explanandum* to have a distinct efficient cause) guarantees that the theory is one according to which the originator really exists (or has existed). And an embargo on theoretical redundancy implies the converse for the unmoved mover of *Metaphysics* XII.7. In other words, if the mover is assumed as really existent, this must be because it figures as efficient cause.⁵⁵ Now Aristotle clearly does assume in *Metaphysics* XII that the unmoved mover really exists as distinct from being merely the content of an idea in the minds of the spheres.⁵⁶ It follows that he is committed to treating that mover as an eternally efficient, as well as exemplary, origin of their motion; and this notwithstanding the difficulty we have of forming a conception of how its efficiency ‘works’, given that this cause is not only incorporeal but ‘separate’ (1073a4). Aristotle’s willingness to think in this way about the eternal cause of an eternal effect, suggests that on this score he has no quarrel with the Platonists. Both they and he envisage the cause as both efficient (‘paternal’ for the Platonists) and final/exemplary. It is not uncommon to see in *Metaphysics* XII a bid to replace Platonist Forms with Aristotle’s own incorporeal substances, the intellectually active movers.⁵⁷ Such a reading assumes something of a shared framework.

⁵⁴ On this picture the souls of the spheres would be the efficient cause of the motion.

⁵⁵ For obviously it is not a material or formal cause of the motion.

⁵⁶ It is hard to read chapter 10 otherwise than on this basis. But the clinching evidence is at 1071a17-24, highlighted by Owens, 1950 (on the text and interpretation see also Code, 2000, 174-175). This passage states that a primary principle (like an ordinary substance) is a *this*, and that universals (which by definition are not *thises*) are not primary principles. The intentional object of thought and desire is surely a universal. Thus it is clearly implied here that the ultimate unmoved mover ‘really exists’. An intentional object is still a universal even if it is such that were it to be instantiated it would be instantiated uniquely. The general point still holds if there is a plurality of unmoved movers, one for each sphere. Each, if a merely intentional object for its sphere, would be a universal, even though this universal, if instantiated, would be instantiated uniquely.

⁵⁷ Cf. 1071b12-22; 31-1072a3; 1075b16-20; 27-30. See e.g. Burnyeat 2001, 132; Laks 2000, 225 on the ‘Platonic horizon of Aristotle’s approach’ in *Metaphysics* XII. 7.

It would be a good example of this if both sides operated from much the same conception of causation at the level of eternal, even while occupying widely opposed positions on what sort of eternal entity needs to be explained, and what sort fills the ultimate explanatory role.

Section E: Objections and replies

(34) Certain passages may seem to tell against conclusions argued for above. Thus *Physics* II, 198a24-28, has sometimes been thought to imply that Aristotle denies that efficient and exemplary causality are merged in the unmoved mover(s) of *Metaphysics* XII. The passage says:

The last three [sc. of the four causes] often coincide (ἔρχεται εἰς ἓν); for the what and that for the sake of which are one, while the primary source of motion is the same in species (τῷ εἶδει) as these. For man generates man – and so too, in general, with all the things which cause movement by themselves being moved; and such as are not of this kind are no longer inside the province of natural science (tr. Hardie and Gaye).

The formal, final, and efficient causes coincide in many cases, Aristotle says, and he seems to suggest that a (or: the) case where they do *not* coincide is that of the unmoved movers which are a topic of first philosophy, not physics. This may seem to tell strongly against the idea that the unmoved mover is both efficient and final/exemplary cause of celestial motion.⁵⁸ Such an appearance, however, rests on a misunderstanding of ‘coincide’ at line 24. Aristotle’s point is that ‘in many cases’ (in fact many sublunary cases) the same specific term applies to the formal, final, and efficient causes. This is illustrated with ‘man generates man’ (26-27). The first occurrence of ‘man’ indicates the efficient cause, the second the final cause, and the numerically distinct parent and offspring share the form. By contrast, an unmoved mover does *not* share the same description as what it is cause of, whether we think of this as the moving

⁵⁸ Ross gets round this by taking Aristotle to be denying the coincidence of all three mentioned causes at the level of changeless things: ‘the formal cause ἐν τοῖς ἀκινήτοις is *not* an efficient or a final cause’ (Ross 1936, 526, his emphasis). Ross 1924, vol. 1, cxxxiv, says that it is beyond doubt that the prime mover of *Metaphysics* XII is efficient as well as final cause.

sphere or motion of the sphere; but this is not a reason why the unmoved mover cannot function as both efficient and exemplary cause.⁵⁹

(35) I have argued that when it comes to explaining everlasting things such as celestial motion and the endlessness of sublunary coming-to-be, Aristotle falls back on a schema of two (at most) principles which thus far mirrors the Platonist one.⁶⁰ But there is a possible objection based on a passage in *GC* II.9. This chapter comes after his discussion of the sublunary elements and compounds and before his proof (chs. 10 – 11) that coming-to-be is necessarily everlasting and cyclical. Chapter 9 begins by announcing: ‘We must state the *number* and the *nature* of the principles of all coming-to-be alike, for a grasp of any universal facilitates the understanding of its specific forms’. The answer comes in the next sentence:

(P) The principles [*sc.* of coming-to-be] are equal in number to, and identical in kind with, those in the sphere of the eternal and primary things (335a24-32, tr. follows Joachim).

⁵⁹ At *On Generation and Corruption* I, 324b13-15, Aristotle says that the final cause is only ‘metaphorically’ (i.e. by a slide of meaning) called ‘efficient’ (ποιητικόν). One might see here a general rejection of the compatibility of final and efficient causality in the same being. But the meaning is only that we do not properly use ποιητικόν of the final cause as such.

⁶⁰ It may be worth noting that logically the Platonists could have claimed a *Physics* I-style triadic analysis for their explanations of eternal things by eternal things, namely by assigning the role of privation to the counterfactual state of affairs. E.g. the formal principle eternally ‘brings it about that’ the indeterminate Great and Small ‘becomes’ configured as a range of determinate properties, instead of ‘remaining’ unconfigured. Here the Great and the Small appears as a subject common to both *termini*, the real *ad quem* and the counterfactual *a quo*. But there is no evidence that this idea played any part in Platonist thinking, although it would have been useful for those who refused to accept as literal the Timaeian transition from pre-cosmos to cosmos. They could have claimed that the text, correctly understood, depicts a purely logical transition ‘to’ how things are ‘from’ how things would have been without the Demiurge. Had they made this move Aristotle would surely have registered it when he criticizes their anti-literalist interpretation (*On the Heavens* I, 279b32-280a10). But in any case the idea of a purely counterfactual *terminus a quo* rests on the analogy with a *temporally* previous state of privation: it offers an eternalized version of a temporally successive structure. Hence the move to the counterfactual would most naturally recommend itself to those who, like Aristotle, independently maintain the intelligibility of temporal change in terms of subject, privation, and form, so can confidently accept this as their basis of analogy. The move would not be readily available for Platonists whose comfort-zone and heuristic base is among the eternal intelligibles.

Aristotle then goes on to discuss the inadequacy of matter and form (the latter is also said to be the final cause, 335b6), separately or together, to explain coming-to-be: there must be a third principle, the efficient cause (335a29-32; b5-336a12). Failure to distinguish it was the great mistake of both Platonists and materialists (335b7-13). This leads into chapter 10, where the efficient causality of the sun's annual circling is the main theme. The presence of premiss P in the sequence of thought seems quite inconsequential. From P itself one might have expected that Aristotle would start by pointing out the number and kinds of principles operative in the sphere of eternal things, and then infer, via P, that the same number and kinds apply in the realm of generable-perishables. But he does not do this in any clear way, and the procedure would in any case be strange, since it is much more obvious that distinct principles of form, matter, and the efficient cause obtain for generable-perishables than for eternal things.

(36) Even so, P presents a problem for my general argument. Taken at face value it purports to deduce, one for one, the principles of coming-to-be from the principles of eternal things. So, given that form, *hupokeimenon*, and privation are principles of coming-to-be, there must be a matching set of principles on the eternal level. Thus there would be eternal form, eternal subject, and eternal privation distinct from the subject. Being eternal they would have to co-exist, so form would be compresent with its own privation! To avoid the absurdity Aristotle would have to renounce the triadic scheme of *Physics* I and all that went into establishing it. But the rather sententious and potentially highly disruptive P is a much stronger claim than Aristotle needs in the context. In the first place, by 'principles' at 335a25 he probably means the narrower category of 'causes', since the only principles mentioned are causes (and are called such at 33; b5; 336a2-3). So privation is not under discussion. Secondly, all that the argument of *GC* II.10 requires is an eternal efficient cause of sublunary coming-to-be and perishing. (Since the cause is eternal, so is the effect: QED.⁶¹) To make credible the notion of an eternal efficient cause, Aristotle need have said no more than: 'There must be sublunary efficient causality - the materialist thinkers and Plato in the *Phaedo* were totally wrong to assume that all the work could be done by matter or form. So why wouldn't there also be an eternal efficient cause?' This, I suggest, is all we need take him to mean by P.^{62,63}

⁶¹ The eternal alternation of *genesis* and *phthora* is not, however, the logically immediate effect of the sun's eternal motion; the transient seasonal episodes are produced one at a time by an eternally repeating cause.

⁶² We can see *GC* II. 9 – 10 as responding to the view that the on-goingness (let alone perpetuity) of the generations of sublunary things must be due to something eternal that is part of their own nature: so either they are constituted from eternal materials or they are participants in eternal Platonist forms. Aristotle's solution in terms of an eternal (eternally recurring) *efficient* cause places the source of sublunary on-

Section F: In conclusion

(37) Overall Aristotle is irreducibly pluralist in his approach to physical explanation. The triadic scheme is limited to sublunary change, while a sort of dyadic scheme is reserved for celestial motion. His necessary although limited endorsement of dyadism can be seen as cutting both ways dialectically. The Platonists could perhaps look on it as something of a triumph for themselves: ‘See how Aristotle comes round to copying for his own purposes our signature dyadic system.’ But from Aristotle’s corner could come the reply: ‘As a survey of all other thinkers makes plain, everyone hankers after changeless principles, not least, of course, you Platonists. But you with your dyadic approach cannot satisfy the desideratum except where the *explananda* are themselves eternal things such as forms, ranges of determinates of a determinable, and mathematical entities. In effect, you let everything else fall below the threshold of intelligibility. *We*, on the other hand, invoke changeless principles not only in ascending from our sublunary physics to our celestial physics, and from there to our first-philosophical search that leads to the unmoved movers - but even within the realm of sublunary physics. For in this realm the *roles* of privation, subject, and form are constant: they structure every change.⁶⁴ Thus we not only meet the general demand for changeless principles, but do so in a way that accommodates our achievements in sublunary science. It is plain for all to see that our sublunary science exceeds everyone else’s so far in its detail of explanation, its vigour in generating a plethora of worthwhile inquiries, and its power for organizing our perspectives on the phenomena.⁶⁵ Our accommodation postulates both the triadic

goingness right outside the things themselves, in a non-mysterious visible physical being and one whose matter and form in no way resemble theirs.

⁶³ Another explanation of P is that it is *ad hominem* against certain Platonists and is only concerned to establish efficient causality within the sublunary realm: since *they* recognize matter, form, and a distinct efficient cause on the eternal level (sc. the cosmic *nous* of *Philebus* 26e-27b or the Demiurge of the *Timaeus*; 336b30-32 possibly echoes *Timaeus* 41b7-c2), they should also allow for all three when explaining non-eternals.

⁶⁴ Cf. *Metaphysics* XII, 1070a 30 ff.: the causes and principles are the same for all (sublunary) things if one speaks ‘universally and analogically’. (The focus *ad loc.* is on transcategorical universality.)

⁶⁵ A survey of the Aristotelian corpus in canonical order would set a major challenge for Platonists before one even gets to the *Metaphysics*. They cannot reasonably ignore as ‘unknowable’ the gamut of phenomena that receive in Aristotle’s hands thorough and fruitful explanation; thus they ought to accept that any alternative set of principles must achieve on its own terms at least that much.

framework for explaining individual sublunary changes, and the dyadic one for explaining the celestial motions that explain the everlasting repetition of such changes. There is neither inconsistency nor unprincipled borrowing here.’

(38) Whichever way the ancient dialectical advantage falls, we as philosophers probably find ourselves ambivalent. On the positive side, Aristotle achieves for sublunary phenomena an omni-applicable, so in a sense omnipresent and eternal, set of principles by distinguishing the explanatory role represented by a principle-type from whatever *particular item* may happen to fill the role in a given case (see *Metaphysics* XII. 1070a31-b29; 1071a24-35).⁶⁶ This inspired step, sophisticated yet immediately intelligible to common sense, advances the whole business of inquiring into principles to a new level of maturity. The step has been achieved through attention to our ordinary - but pre-theoretically fine-tuned - ways of speaking about things as they change and result from change. (These unselfconscious language-borne lineaments of experience are among the things ‘clearer and more knowable to us’; but when people begin to philosophize about change they introduce confusions which only further philosophy can clear away. After philosophy regains those lineaments at the reflective level, they are ready to function as scientific principles, things ‘clearer and more knowable by nature’ [*Physics* I, 184a16-21].) We ourselves probably admire this methodological turn of Aristotle’s, and feel at home with this approach to explanation. By contrast, we are probably disinclined to take a more than historical interest in his theory of celestial spheres that are both physical and literally ungenerated and imperishable. The stumbling-block from a modern standpoint is not so much the obsolete astronomy as the exemption of the spheres and their motion from any kind of evolution, decay, and interference from or interaction with other materials or

⁶⁶ See Crubellier 2000, on the identity of principles in *Metaphysics* XII. 4; also Stephen Menn’s chapter in this volume on sublunary principles as types or variables (in the logical sense) made salient through drawing analogies between categorially and empirically different cases. The discussion by Wieland, 1960-1, is seminal. Wieland sees Aristotle as proceeding by way of conceptual analysis and ‘concepts of reflection’ (cf. Bostock 1982). Moravcsik 1991, balances this by emphasizing that Aristotle is not seeking linguistic clarification as such, but explanation in terms of real configurations of things. See also Freeland 1991 on Aristotle’s causal and explanatory realism. My own stress is on a different point: that Aristotle’s move to the meta-level, and his focus on omni-present analogy-patterns, are his way of preserving for sublunary phenomena something of the intuition that a genuine principle is eternal-like in not being restricted to particular places or times.

forces in the universe. The spheres are particular physical and corporeal objects, yet they have attributes commonly ascribed to gods and also to laws of nature. And perhaps even more alien from our point of view is the way in which, to explain the motion of the spheres (a physical phenomenon, after all), Aristotle in effect merges principles with real particular individuals. His incorporeal movers are a set of real particular individuals that do not merely bear or occupy the roles whereby they are principles of eternal motion, but through and through essentially just *are* the principles they are. They are reifications, because their *only* properties (not merely only those we are currently able to ascribe to them) are what they need for being the principles of the *explanandum* for which they were postulated. It is like an orchestra whose members, including the conductor, have no existence outside the orchestral performance.

(39) Aristotle's eternal incorporeal movers certainly remind us of Platonist forms, another sort of entities both real and supposed to be principles through and through. If the Aristotelian movers displace Platonist forms, it is not because they do a better job of avoiding reification. I do not think that they do, nor that Aristotle would have seen what we call 'reification' as necessarily abhorrent. If Aristotle's unmoved movers displace Platonist forms, it is because they do a better job of explaining eternal motion and the infinite series of sublunary generations (cf. *Metaphysics* XII, 1071b12-20), while leaving it to the triadic scheme to shed light on the individual stages of the series. At the sublunary level actual beginnings and culminations are possible and intelligible because non-eternal protagonists move in and out of principal roles that never go out of date.⁶⁷ To some archaic eyes this might have seemed a cheap and disappointing way of establishing 'omnipresent and everlasting' principles. But it is the price for having a science of substances that both generate and are generated.

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⁶⁷ This is the solution to the problem at *Metaphysics* III, 1000b29-31, of how perishable things can have imperishable principles.

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