

EMENDATIONS IN COSMOLOGICAL TEXTS

Pl., Tim. 46c 7: The mechanism of vision has been explained and Plato now points out that what he has set forth is *συναίτια*, secondary causes unrelated to mind and soul. The philosopher prefers the purpose cause which is a manifestation of intelligent order in the physical world. d7ff.: *τὸν δὲ νοῦ καὶ ἐπιστήμης ἐραστὴν ἀνάγκη τὰς τῆς ἔμφρονος φύσεως αἰτίας πρῶτας μεταδιώκειν, ὅσαι δὲ ὑπ' ἄλλων μὲν κινουμένων, ἕτερα δ' ἐξ ἀνάγκης κινούντων γίνονται, δευτέρας*. The second half of the sentence *ὅσαι δὲ... δευτέρας* must contain a description of the mechanical causes and we understand that they take the form of some objects (b) moved by others (*ὑπ' ἄλλων*, a) and in turn moving a third group (*ἕτερα*, c). To the one genitive *τῆς ἔμφρονος φύσεως* corresponds the other... *κινουμένων, ἕτερα δὲ... κινούντων*; and in both instances the genitives determine a type of *αἰτίαι*, since clearly *τὰς τῆς ἔμφρονος φύσεως αἰτίας* (c8) is taken up by *ὅσαι δὲ* (scil. *αἰτίαι*) in the second half of the sentence. This symmetry is disturbed by *γίνονται* (12) whose presence seems due to a misunderstanding of *ὑπ'* which is to be taken with *ἄλλων* but could easily be misunderstood as introducing everything that follows down to and including *κινούντων*. In Soph. 265 c, a passage adduced by Cornford (Plato's Cosmology 157, n. 1) as support for *αἰτίαι γίνονται* the genitive forms a part of a quite different construction. It seems necessary to excise *γίνονται*.

Tim. 52b 6: The existence of *χώρα* and the fact that sense perceived objects move into and out of a place (*τόπος*, 52a 5-7) causes serious errors concerning the true realities. We persuade ourselves *εἶναι πῶς τὸ ὄν ἅπαν ἐν τινὶ τόπῳ...* (b4f.); hence what has no place on Earth or elsewhere is considered *οὐδὲν εἶναι*. Holding such views we approach the *εἶδη* in the wrong spirit: *ταῦτα δὴ πάντα* (i e. existence in space) *καὶ τούτων ἄλλα ἀδελφὰ καὶ περὶ τῆν ἄνπνον καὶ ἀληθῶς φύσιν ὑπάρχουσαν ὑπὸ ταύτης τῆς ὀνειρώξεως οὐ δυνατοὶ γιγνώμεθα ἐγεροθέντες διοριζόμενοι τὰληθῆς λέγειν...* (this "truth" is in the remaining part of the sentence set forth in a rather involved manner¹); the gist however is that

1) The most elaborate interpretation known to me is that of Cherniss (now reprinted in Selected Papers, Leiden, 1977, 364ff.). It is unimpeachable

only images, not the *ὄντως ὄν* exists in place). Of the sentence just written out the latter part beginning *ὑπὸ ταύτης τῆς ὄνειρώξεως* is far easier to construe than the former. For *ταῦτα δὴ πάντα... ἀδελφά* we need a verb, preferably in the form of a participle to which *ταῦτα... ἀδελφά* would be the grammatical object. *ὑπολαμβάνοντες* is the best I can think of. Between *ὑπάρχουσιν* and *ὑπὸ* it could easily drop out. If *ὑπο* in three successive words is stylistically offensive, *ὑπάρχουσιν ὑπο(λαμβάνοντες ἐκ) ταύτης τ. ὄν.* may be a better proposal. Still another possibility would be to insert *ὑπολαμβάνοντες* after *ὄνειρώξεως*, though since the dreaming is the cause why even after waking up we cannot make the right distinctions it is clearly better not to separate *ὄνειρώξεως* from *οὐ δυνατοὶ γιγνώμεθα*.

Tim. 53 a 5 ff.: The movement in the Receptacle causes some separation of its ingredients. What is dense and heavy tends in one direction, what is rare and light *εἰς ἑτέραν... ἕδραν* (53 a 1 f.). The result is summed up thus: *διὸ δὴ καὶ χώραν ταῦτα ἄλλα ἄλλην ἴσχειν, πρὶν καὶ τὸ πᾶν ἐξ αὐτῶν διακοσμηθῆν γενέσθαι*. Cornford translates: "whereby the different kinds came to have different regions even before the ordered whole consisting of them came to be." One may wonder whether the notion of order should not rather be made a part of the predicate. The "whole" comes into being out of them by an ordering process. However even as translated by Cornford the Greek would be *... καὶ πρὶν...* not *πρὶν καὶ...* The creation of the Cosmos (no matter how understood) is treated as the great event which separates one state of things from another; what matters at this point is that certain conditions characteristic of the Cosmos had in a very limited way developed even before this creation. To be sure this early development before the creation (*πρὸ τούτου* a 8) lacked proportion (*ἀλόγως*) and measure which were introduced *ὅτε δ' ἐπεχειρεῖτο κοσμεῖσθαι τὸ πᾶν* (b 1). The decisive quality of this all-important step must not be blurred by *πρὶν καὶ...* We may note that *καί* precedes *πρὶν* in the sentence which opens the description of the precosmic condition: *... ὄν τε καὶ χώραν καὶ γένεσιν εἶναι, τρία τριχῆ, καὶ πρὶν οὐρανὸν γενέσθαι* (52 d 3 f.).²⁾

as far as grammar and usage go, though I have wondered at times whether it adds enough to the sense and whether the thought which it negates would not be an absurdity.

2) Tim. 53 a 5 ff. I would also not hesitate to compare Arist., *de caelo* II 13, 295 b 6 f.; *ἦν ἄρα καὶ πρὶν γενέσθαι τὴν δίνην βαρὺ τε καὶ κοῦφον*, even though that passage refers not to the Platonic but to a Presocratic cosmo-

Arist., Phys. III 5, 204b 26ff.: Some thinkers who entertain the hypothesis of an infinite body do not identify this body with one of the basic elements; for an infinite element would destroy the others because the qualities characteristic of the elements are contrary to one another. ἔχουσι γὰρ πρὸς ἄλληλα ἐναντίωσιν – οἷον ὁ μὲν ἀήρ ψυχρός, τὸ δ' ὕδωρ ὑγρόν, τὸ δὲ πῦρ θερμόν, (ἡ δὲ γῆ ξηρά), ὧν εἰ ἦν ἐν ἄπειρον, ἐφθαρτο ἂν ἤδη τὰλλα. The clause ὧν εἰ ἦν ἐν ἄπειρον suggests that a full list of the elements including an opposite to the ὑγρόν preceded, (if οἷον indicates a selective procedure this need not indicate that of the four elements only three are used as examples. It is just as likely to refer to the opposite qualities of the elements which are more than one in each case; yet only the most important one is here selected).

Phys. IV 11, 219a 28: Although my proposal receives its strongest support from the sentence which follows, I think it well to go back five lines to a 22 where Aristotle declares: ἀλλὰ μὴν καὶ τὸν χρόνον γε γνωρίζομεν ὅταν ὀρίσωμεν τὴν κίνησιν, τῷ πρότερον καὶ ὕστερον ὀρίζοντες. Clearly ὀρίζειν cannot here mean “define” but is used for the separating off of parts or the placing of boundaries³). We are cognizant of χρόνος when with the help of movement we notice sequences of “earlier” and “later” stretches: ὀρίζομεν δὲ τῷ ἄλλο καὶ ἄλλο ὑπολαβεῖν αὐτά (scil. the successive phases or “before”), καὶ μεταξὺ τι αὐτῶν ἔτερον. In the next sentence it is not the μεταξὺ which matters but the πρότερον and ὕστερον: ὅταν γὰρ ἕτερα τὰ ἄκρα τοῦ μέσου νοήσωμεν, καὶ δύο εἴπῃ ἡ ψυχὴ τὰ νῦν, τὸ μὲν πρότερον τὸ δ' ὕστερον, τότε καὶ τοῦτό φαμεν εἶναι χρόνον. (26–29). Obviously the ἄκρα are the earlier and the later νῦν. While we are familiar with expressions of the

gony and conditions preceding it. And I notice with interest “even before” in modern scholarly discussions of the subject (e.g. Vlastos, “The Disorderly Motion in the Timaeus” in R.E. Allen (ed.), Studies in Plato’s Metaphysics, London–New York, 1965, 390. See also Hans Herter, Kleine Schriften (München, 1975) 342 and pass., who like Vlastos emphasizes how utterly different conditions in the Receptacle as described here are from those brought about by the Demiurge and the operation of a cosmic Soul. πρὶν καὶ blunts the edge of this antithesis and makes us think of the cosmic arrangement as something like the final outcome of the precosmic separations.

3) “einen Schnitt legen” Hans Wagner, Aristoteles Physikvorlesung (= Aristoteles Werke in deutscher Übersetzung herausgeg. von Ernst Grumach, vol. 11, Berlin, 1976). I have not indicated every instance where I have been confirmed in my views by Wagner’s translation or by his notes. W.D. Ross, Aristotle’s Physics (Oxford, 1936) has also been regularly consulted.

“then and there” type and might also accept a “then and this”, the Greek sentence seems to gain in clarity if after *τότε* we insert *ὀρίζομεν*. That we do justice to Aristotle’s meaning is shown by what follows: *τὸ γὰρ ὀριζόμενον τῷ νῦν χρόνος εἶναι δοκεῖ καὶ ὑποκείσθω*. (29f.)

Phys. IV 13, 222 b 4: Aristotle’s very elaborate investigation of *χρόνος* and its relation to movement (or change in general, *κίνησις*) has led him to study also the “now”, an important if in some ways puzzling subject. We shall see later that it can be regarded as separating “before” and “after”. With reference to what goes on beforehand it is the “end”, while for what comes it is the “beginning”. These characteristics of the “now” have a bearing on *χρόνος*. *ἐπει δὲ τὸ νῦν τελευτῆ καὶ ἀρχῆ χρόνου, ἀλλ’ οὐ τοῦ αὐτοῦ, ἀλλὰ τοῦ μὲν παρήκοντος τελευτῆ, ἀρχῆ δὲ τοῦ μέλλοντος, ἔχει ἂν ὥσπερ ὁ κύκλος ἐν τῷ αὐτῷ πως τὸ κυρτὸν καὶ τὸ κοῖλον, οὕτως καὶ ὁ χρόνος αἰεὶ ἐν ἀρχῇ καὶ τελευτῇ*. Ross (ad. loc.) quite correctly observes that it is unnecessary to make this sentence finish *ἐν τῷ αὐτῷ πως ἀρχῆν καὶ τελευτῆν* “as strict grammar would require”; but to read and construe *ἔχει ἂν... ὁ χρόνος αἰεὶ ἐν ἀρχῇ καὶ τελευτῇ* remains harsh and the parallel with the circle which “has” at once “the” concave and “the” convex can be achieved by supplying a *τό* before the words *ἐν ἀρχῇ καὶ τελευτῇ*. From the “now” which actually is *ἀρχῆ καὶ τελευτῆ* time acquires the characteristic of having *〈τὸ〉 ἐν ἀρχῇ καὶ τελευτῇ*⁴).

Phys. V 5. 229b 16ff.: What kind of changes (*μεταβολαί*) and what movements (*κινήσεις*) should be considered contrary to one another? These questions and the various possibilities of answering them have engaged Aristotle from the beginning of V. 3. At 229a 27 he has decided in favor of changes to contraries and from contraries, two kinds theoretically, but they coincide often, since a movement from right to left is the contrary of one from left to right and a change from health to illness the contrary of one from illness to health. At 229b 14 Aristotle wonders how to treat intermediate positions on the way from contrary to contrary. They too are somehow contraries, he suggests and supports this by using “grey” (*φαιόν*) as an illustration. I doubt however whether the sentence embodying the illustration has

4) A similar *τό* indicating a concept or principle (though in this instance it happens to be the absence of a principle and as a result the rule of chance) should be supplied at II 8, 199b 14: *ἔτι ἔδει καὶ ἐν τοῖς σπέρμασι γίγνεσθαι 〈τὸ〉 ὅπως ἔτυχεν. τὸ ὅπως ἔτυχεν* is an alternative to *τὸ ἐνεκά του* (199b 10; 30), *τὸ ἐξ ἀνάγκης* (ibid. 34) and similar concepts.

been transmitted correctly. My quotation includes the addition and deletion that seem desirable: *ὡς ἐναντίω γὰρ χοῖται τῷ μεταξὺ ἢ κίνησις, ἐφ' ὁπότερα ἂν μεταβάλλῃ, οἷον ἐκ φαιού μὲν εἰς τὸ λευκὸν ὡς ἐκ μέλανος <καὶ εἰς τὸ μέλαν ὡς ἐκ λευκοῦ>, καὶ ἐκ λευκοῦ εἰς φαιὸν ὡς εἰς μέλαν, ἐκ δὲ μέλανος εἰς φαιὸν ὡς εἰς λευκὸν [τὸ φαιόν]*. It is hard to believe that Aristotle, especially after the clause *ἐφ' ὁπότερα ἂν μ.*, should have left one of the four possibilities to the reader to supply.

Phys. VIII 1, 252a 15: While upholding his thesis of the eternity of movement, Aristotle finds a good deal to criticize in what he regards as arbitrary assumptions of the Presocratics. Simply to declare *ὅτι πέφυκεν οὕτως* as he thinks they do cannot provide a valid *ἀρχή* for a physical system (252a 5 ff.). Anaxagoras who posits a single *ἀρχή* – obviously a reference to the *Νοῦς* – lays himself open to a special attack. He supplies no cause for the transition from the initial *πάντα ὁμοῦ* without motion to the motion caused by *Νοῦς* and he fails to explain why this happened just at one particular time: *ἀλλὰ μὴν οὐδὲν γε ἄτακτον τῶν φύσει καὶ κατὰ φύσιν· ἢ γὰρ φύσις αἰτία πᾶσιν τάξεως. τὸ δ' ἄπειρον πρὸς τὸ ἄπειρον οὐδένα λόγον ἔχει· τάξις δὲ πᾶσα λόγος*. Here *λόγος*, as the commentators observe, is to be understood as “numerical ratio”. *τὸ δ' ἄπειρον χρόνον ἠρεμεῖν, εἶτα κινήθηναί ποτε, τούτου δὲ μηδεμίαν εἶναι διαφορὰν, ὅτι νῦν μᾶλλον ἢ πρότερον, μηδ' αὖ τινὰ τάξιν ἔχει, οὐκέτι φύσεως ἔργον*. I find it difficult to make sense of the words *τούτου δὲ μηδεμίαν εἶναι διαφορὰν* unless I add *αἰτίαν* (after *μηδεμίαν*); for Aristotle evidently misses not a difference between rest and motion but a different condition which would account for the transition from rest to movement. Why should movement arise at one particular point of time rather than at another? We read immediately afterwards that Nature acts either *ἀπλῶς οἱ*, i.e. if its way of action changes there is a reason for it: *λόγον ἔχει τὸ μὴ ἀπλοῦν* (17–19). And when Aristotle next turns to Empedocles, he does find *τάξις* in his scheme (21) but again *δεῖ τὸν λέγοντα μὴ φάσαι μόνον, ἀλλὰ καὶ τὴν αἰτίαν αὐτοῦ λέγειν* (22 f.)⁵.

5) I may as well admit that I feel uneasy also about the passage dealing with the omissions of Empedocles. My suggestion may prompt somebody else to come forward with a more satisfactory explanation. Empedocles' assumptions (*ὑποτεθέντα*, a 25 f.), i.e. Philotes and Neikos plus the descriptions given of them do not account for their regular alternations in the cosmic processes.: *οὐδὲ τοῦτ' ἦν τὸ Φιλότητι ἢ Νείκει εἶναι, ἀλλὰ τῇ μὲν τὸ συνάγειν, τῇ δὲ τὸ διακρίνειν* (a 26 f.), *εἰ δὲ προσδιοριεῖται τὸ ἐν μέρει, λεκτέον <διὰ τί καὶ μὴ μόνον> ἐφ' ὧν οὕτως, ὥσπερ ὅτι συνάγει τοὺς ἀνθρώπους ἢ φίλια*

Phys. VIII 3, 253b 22: Changes, extensions, activities and much else may be divided into successive parts or portions but it must be asked whether it is always correct to apply this viewpoint. We may here content ourselves with two of Aristotle's illustrations: If a certain number of men haul a ship in a certain time a certain distance it is their cumulative effort which achieves this and it would be wrong to suppose that say a third of that number haul the boat a third of the distance. The same kind of reasoning applies to the melting of an object through the action of moisture (Aristotle speaks of "drops", *σταλαγμοί* b 14ff.). It is doubtless correct to say that "the amount removed is divided into a number of parts": *διαριεῖται... τὸ ἀφαιρηθὲν εἰς πλείω* even though the parts were not removed separately but everything at the same time (19–21); but when the Mss continue *φανερὸν οὖν ὡς οὐκ ἀναγκαῖον αἰεὶ τι ἀπιέναι, ὅτι διαριεῖται ἢ φθίσις εἰς ἄπειρα...*, (21–23) it seems better to write *διαριετή* because to potential divisibility there is indeed no limit; whereas what actually happens is something different: *ἄλλοι ποτὲ ἀπιέναι* (21–23). The observation about another type of change in the next sentence is apt to support my suggestion: *οὐ γὰρ εἰ μεριστὸν εἰς ἄπειρα τὸ ἀλλοιούμενον, διὰ τοῦτο καὶ ἡ ἀλλοίωσις, ἀλλ' ἀθροῖα γίνεταί πολλακίς...*, (23 ff.).

Phys. VIII 4, 255a 9ff.: Every object moved owes the impulse of the movement to something, though not always or necessarily to something other than itself. Living beings in particular are self-movers. But what are we to think about objects heavy and light? If these objects move toward the *ἀντικείμενοι τόποι*, i. e. heavy things upward, light downward, this motion is called *βία* or contrary to nature. Thus the motion downward of heavy, upward of the light things must be *φύσει*, but what causes them to move? To say that they are moved by themselves is impossible since this is a peculiar capacity of living beings. Also if they can move themselves, they should also be

καὶ φεύγονσιν οἱ ἐχθροὶ ἀλλήλους. τοῦτο γὰρ ἐπιτίθεται καὶ ἐν τῷ ὅλῳ εἶναι. φαίνεται γὰρ ἐπὶ τινῶν οὕτως (a 27–31). Empedocles, as I understand the text has provided illustrations, which amount to proofs, of how Love and Strife operate; more specifically he has pointed to their manifestations in human life and assumed the same *ἐν τῷ ὅλῳ* (30). But periodic alternation is not explained in this way: *τὸ δὲ καὶ δι' ἴσων χρόνων δεῖται λόγον τινός* (31 f.). *δι' ἴσων χρόνων* goes even beyond the *ἐν μέρει* of a 27 ff., and I cannot help the impression that the logic of the sentence *εἰ δὲ προσδιοριεῖται...* points to the demand for a reason of the *ἐν μέρει*, the ruling "in turn".

able to do the opposite: *καὶ ἰσχύειν ἂν ἐδύνατο αὐτὰ αὐτά· λέγω δ' οἷον, εἰ τοῦ βαδίζειν αἴτιον αὐτῶ καὶ τοῦ μὴ βαδίζειν*. The next sentence (a 9f.) runs: *ὥστ' εἰ ἐπ' αὐτῶ τὸ ἄνω φέρεσθαι τῷ πυρὶ, δῆλον ὅτι ἐπ' αὐτῶ καὶ τὸ κάτω*. Is this another illustration of "being able to do the opposite"? We would not expect to see it introduced by *ὥστε*. Somehow this second example seems pointless. When we read the next sentence: *ἄλογον δὲ καὶ τὸ μίαν κίνησιν κινεῖσθαι μόνην ὑφ' αὐτῶν, εἶγε αὐτὰ ἐναντὰ κινουῦσιν* we realize that this is the argument which the second example illustrates. Evidently the two sentences must exchange their places: *ἄλογον δὲ καὶ – εἶγε ἀ. ε. κινουῦσιν ὥστ' εἰ... καὶ τὸ κάτω*.

Phys. VIII 7, 260a 20ff.: *Ὅδ' μὴν ἀλλὰ καὶ ἄλλην ποιησαμένους ἀρχὴν μᾶλλον ἔσται περὶ τούτων* (scil. about the first mover and the first movement of the Cosmos) *φανερὸν. σκεπτέον γὰρ πότερον ἐνδέχεται τινα κίνησιν εἶναι συνεχῆ ἢ οὐ, καὶ εἰ ἐνδέχεται, τίς αὕτη, καὶ τίς πρώτη τῶν κινήσεων δῆλον γὰρ ὡς εἴπερ ἀναγκαῖον μὲν ἀεὶ κίνησιν εἶναι, πρώτη δὲ ἦδε καὶ συνεχῆς, ὅτι τὸ πρῶτον κινουῦν κινεῖ ταύτην τὴν κίνησιν, ἣν ἀναγκαῖον μίαν καὶ τὴν αὐτὴν εἶναι καὶ συνεχῆ καὶ πρώτην*. The sentence beginning *σκεπτέον γὰρ*... leaves us with the impression that Aristotle is about to examine three questions: 1) Is there such a thing as a continuous movement? 2) If yes, what kind of movement is it? 3) Which movement is to be considered the first? We understand however that in the last words of the passage quoted he anticipates some of his findings including the identity of the first and the continuous movement (with a kind of enthusiastic conviction he expands *συνεχῆ* into *μίαν καὶ τὴν αὐτὴν καὶ συνεχῆ*). Suspicion is however aroused by the appearance of the words *πρῶτη δὲ ἦδε καὶ συνεχῆς* earlier in the same sentence. For not only does the concluding part of this sentence *ἣν ἀναγκαῖον...πρῶτην* lose much of its force if its essence is announced beforehand; it is also far more natural to read the *εἴπερ ἀναγκαῖον μὲν ἀεὶ κίνησιν εἶναι* as meaning that there must always be movement than as asserting the existence of one particular continuous movement. That movement *ἀεὶ ἦν καὶ ἀεὶ ἔσται*, as something *ἀθάνατον καὶ ἄπανστον* (250b 13f.) is the first and fundamental thesis of Book VIII established in ch. 1 and defended against contrary theories in ch. 2⁶). The

6) I add a number of other suggestions without doing more than a minimum to support them since arguments as far as they might be necessary would require a disproportionate amount of space: Π 1, 193a 12ff.: according to Antiphon, if a bed were to rot and put forth a shoot this *οὐκ ἂν γενέσθαι κλήνην ἀλλὰ ξύλον, ὡς τὸ μὲν κατὰ συμβεβηκὸς ὑπάρχον, τὴν κατὰ*

clause *πρώτη δὲ...* originated with a reader whose understanding was incomplete and who could not wait.

de caelo I 7, 276a 12 ff. It will be necessary to put here the concluding sentences of I 7 although our concern is with their

νόμον διάθεσιν καὶ [τῆρ] τέγην, whereas the substance (*οὐσία*) is that which persists. – III 6, 206a 21 ff.: *ἀλλ' ἐπει πολλαχῶς τὸ εἶναι, ὥσπερ ἡ ἡμέρα ἔστι καὶ ὁ ἄρὼν τῷ αἰεῖ ἄλλο καὶ ἄλλο γίνεσθαι, οὕτω καὶ τὸ ἄπειρον* (scil. exists as *ἄλλο καὶ ἄλλο* in infinite divisibility, 26 ff.): *καὶ γὰρ ἐπὶ τούτων <τὸ> ἔστι καὶ δυνάμει καὶ ἐνεργείᾳ. Ὀλύμπια γὰρ ἔστι καὶ τῷ δύνασθαι τὸν ἀγῶνα γίνεσθαι καὶ τῷ γίνεσθαι*. (Aristotle has introduced the opposition of *δυνάμει* and *ἐντελεχείᾳ* viz. *ἐνεργείᾳ* at a 14 for *τὸ εἶναι* and has used it ever since.) – IV 2, 109b 6 ff. (from some point of view “place,” *τόπος*, could be identified with the *εἶδος*) *ἢ δὲ δοκεῖ ὁ τόπος εἶναι τὸ διάστημα τοῦ μεγέθους, ἢ ὕλη. τοῦτο γὰρ [ἔτερον τοῦ μεγέθους, τοῦτο δ'] ἔστι τὸ περιεχόμενον ὑπὸ τοῦ εἶδους καὶ ὀρισμένου*. Wagner's rendering “Erstreckung der Ausdehnungsgröße” has caused me to think once more about the deletion but I cannot see that the words in question serve a purpose; conceivably they might be treated as parenthesis intended to justify the use of the word *διάστημα* but at b4 *μέγεθος* itself is the right word for the same thought, nothing *ἔτερον* being needed. – IV 11, 219b 26 *καὶ ἐν τούτοις δὲ μὲν ποτε ὄν <τὸ> νῦν ἔστι τὸ αὐτὸ (τὸ πρότερον γὰρ καὶ ὕστερόν ἔστι τὸ ἐν κινήσει)...* “the now” is the subject of the argument throughout this section of Book IV and the translators and exegetes whom I have consulted in effect deal not with *νῦν* but with *<τὸ> νῦν*.

IV 13, 222a 20 ff. Time can always be considered as situated between a beginning and an end. Thus *πᾶς ἂν εἴη χρόνος πεπερασμένος. ἄρ' οὐδὲν ὑπολείπει; ἢ οὐ, εἴπερ αἰεῖ ἔστι κινήσεις; ἄλλος οὐδὲν <καὶ ἄλλος> ἢ ὁ αὐτὸς πολλαίαι; δῆλον ὅτι ὡς ἂν ἡ κινήσεις, οὕτω καὶ ὁ χρόνος...* The reasoning which follows leads to the conclusion: *καὶ διὰ τοῦτο δοκεῖ αἰεῖ ἔτερος* (scil. *ὁ χρόνος*, 222b 4f.). Note also *ἄλλος καὶ ἄλλος* in Simplicius' comments on the passage (751.5, 6 Diels). – 14, 222b 33 ff.: *λέγω δὲ θάττον κινεῖσθαι τὸ πρότερον μεταβάλλον εἰς τὸ ὑποκείμενον κατὰ τὸ αὐτὸ διάστημα <τὴν αὐτὴν> καὶ ὀμαλήν κίνησιν κινούμενον οἷον ἐπὶ τῆς φορᾶς, εἰ ἄμφω κατὰ τὴν περιφερῆ κινεῖται ἢ ἄμφω κατὰ τὴν εὐθείαν...* The two examples illustrate *τὴν αὐτὴν*.

V 4, 228b 15 ff.: *ἔτι δὲ ἄλλως παρὰ τὰς εἰρημένους λέγεται μία κίνησης ἢ ὀμαλής. ἢ γὰρ ἀνόματος ἔστι ὡς [οὐ] δοκεῖ μία, ἀλλὰ μᾶλλον ἢ ὀμαλής, ὥσπερ ἡ εὐθεία: ἢ γὰρ ἀνόματος διαμετρή. ἔοικε δὲ διαφέρειν ὡς τὸ μᾶλλον καὶ ἦττον.* – 5. 229a 7: *ἔτι δὲ διοριστέον ποῖα κινήσεις ἐναντία <ποῖα> κινήσει, καὶ περὶ μονῆς δὲ τὸν αὐτὸν τρόπον* seems to be the correct heading for the disquisition which fills the remaining chapters of Book V; see also Simplicius 900. 19.–6.229b 28 ff.: *πότερον τῇ ἐνταῦθα μονῇ ἢ ἐκ τούτου ἢ ἢ εἰς τοῦτο κινήσεις ἀντίκειται; δῆλον δὲ ὅτι, ἐπεὶ ἐν δυσίν ἢ κινήσεις ὑποκειμένους <μᾶλλον δὲ λέγεται εἰς ὃ ἢ κίνησις ἢ ἐξ οὐ>, τῇ μὲν ἐκ τούτου εἰς τὸ ἐναντίον ἢ ἐν τούτῳ μονῆ (scil. ἀντίκειται), τῇ δ' ἐκ τοῦ ἐναντίου εἰς τοῦτο ἢ ἐν τῷ ἐναντίῳ*. For the premiss here supplied see 229a28–b2; I do not see how the argument could convince without it. – VI 8, 239a 35 ff.: *ἐν δὲ τῷ νῦν ἔστι μὲν αἰεὶ κατὰ τι μὲν ὄν (a moving body is “over against something”), οὐ μὲντοι ἡρεμεῖ. οὕτε γὰρ κινεῖσθαι οὕτε ἡρεμεῖν ἔστιν ἐν τῷ νῦν, ἀλλὰ μὴ κινεῖσθαι μὲν ἀληθὲς ἐν τῷ νῦν καὶ εἶναι κατὰ τι, ἐν χρόνῳ δ' οὐκ ἐνδέχεται εἶναι κατὰ τι [ἡρεμοῦν]. συμβαίνει γὰρ τὸ φερόμενον ἡρεμεῖν*. The body which is in movement cannot be in a period of time “over against something.”

relation to the chapter as a whole: *ἔτι οὖν παρὰ φύσιν τι μένει ἢ φέρεται, ἀνάγκη τινὸς εἶναι ἄλλον τοῦτον τὸν τόπον κατὰ φύσιν (τοῦτο δὲ πιστὸν ἐκ τῆς ἐπαγωγῆς): ἀνάγκη δὲ μὴ πάντα ἢ βάρους ἔχειν ἢ κορυφότητα, ἀλλὰ τὰ μὲν τὰ δ' οὐ. ὅτι μὲν τοίνυν οὐκ ἔστι τὸ σῶμα τοῦ παντός ἄπειρον, ἐκ τούτων φανερόν.* Throughout ch. s 5–7 Aristotle has built up a terrific battery of arguments against the existence, nay against the possibility of conceiving an infinite body. The last sentence written out above is a fitting conclusion of these arguments. Having read it, we are prepared for a new subject to be taken up in ch. 8. But while this sentence is definitely in place, the presence of neither of the others can be justified. To begin with the latter *ἀνάγκη δὲ*..., it will be well to remember that of the traditional four elements two are light and two heavy. The introduction of the fifth body changed this situation. As it moves neither downward nor upward but performs a circular movement, it is no longer correct to say that every element must have either weight or lightness, and Aristotle himself makes clear this conclusion as explicitly as could be desired immediately after incorporating the new element in his system: *φανερόν ὅτι οὔτε κορυφότητα οὔτε βάρους ἔχει σῶμα ἅπαν* (I 3, 269b 19f.; see also b 20–270a 12). At the end of the disquisitions about the possibility and about the hypothetical implications of an infinite body the observation that not all bodies are either heavy or light⁷⁾ is utterly out of place and no connection, however remote with anything contained in the preceding chapters can account for its presence.

The case for the other sentence *ἔτι...ἐκ τῆς ἐπαγωγῆς* (276a 12–15) is hardly better. Immediately before this sentence it has been established that an infinite body can have no place and is not able to perform any movement (276a 8–12). There is no question of its remaining in or moving to a place *παρὰ φύσιν*⁸⁾.

7) Stocks' rendering of the sentence is correct. Guthrie and Moraux understand that some elements have weight, others lightness. This is excluded by the sentence structure: *μὴ πάντα ἢ... ἢ...* (not all have either the one or the other) *ἀλλὰ τὰ μὲν τὰ δ' οὐ*. The alternative applies to some elements, not to others.

8) Guthrie and Moraux read at the beginning of the former sentence *ἔτι εἰ*, which has strong Mss support, and treat *ἀνάγκη δὲ* as the main clause of the sentence. Legitimate as this procedure is, it does not produce a better sense (if any at all) nor does it make the sentences more relevant to the context. My discussion of a 15 in Aristotle's System of the Physical World (Ithaca, N. Y., 1961) 303 n. 49, was inadequate. Whether we read *ἀνάγκη δὲ* or *ἀν. δέ*, "a connection with the argument against infinity" cannot be

We have probably no choice but to bracket *ἐτι οὐ...τὰ δ' οὐ*, although we cannot explain how the sentences came to be placed here.

de caelo I 8, 276a 22 ff.: *ἅπαντα γὰρ καὶ μένει καὶ κινεῖται καὶ κατὰ φύσιν καὶ βία. κατὰ φύσιν μὲν, ἐν ᾧ μένει [μὴ βία], καὶ φέρεται, καὶ εἰς ὃν φέρεται, καὶ μένει· ἐν ᾧ δὲ βία, καὶ φέρεται βία, καὶ εἰς ὃν βία φέρεται, βία καὶ μένει.* The words *μὴ βία* which I have bracketed disturb the simple and clear-cut statement of correspondences and do not help to bring the antitheses into focus.

de caelo I 8, 277a 12 ff.: The natural movements of the elements have their definite terminus in Aristotle's cosmos: *ὅτι δ' ἔστι τι οὗ πέφυκεν ἢ γῆ φέρεσθαι καὶ τὸ πῦρ, δῆλον καὶ ἐκ τῶν ἄλλων.* What *τὰ ἄλλα* means is not immediately clear; nothing in the preceding argument (276b 26–277a 11) provides light. However with the next sentence we begin to see what Aristotle has in mind: *ὅλως γὰρ τὸ κινούμενον ἐκ τινος εἰς τι μεταβάλλει... πᾶσα δὲ πεπερασμένη μεταβολή, οἷον τὸ ὑγιαζόμενον ἐκ νόσου εἰς ὑγίειαν καὶ τὸ αὐξανόμενον ἐκ μικρότητος εἰς μέγεθος.* These are the *ἄλλα* which make it possible for Aristotle now to conclude: *καὶ τὸ φερόμενον ἄρα· καὶ γὰρ τοῦτο γίνεται ποθεν ποῦ* (a 17f.). Against adding *<μεταβολῶν>* after *ἐκ τῶν ἄλλων* it might be argued that in a treatise, as distinct from a work of literature a certain stylistic casualness should be tolerated. Although I find little or no casual phrasing in these sections of *de caelo*, I did feel some hesitation before I noticed the similar passage in IV 3 (310a 20 ff.): *περὶ μὲν οὖν τοῦ φέρεσθαι εἰς τὸν αὐτοῦ τόπον ἕκαστον ὁμοίως ὑποληπτέον ὡσπερ καὶ περὶ τὰς ἄλλας γενέσεις καὶ μεταβολάς.* Here too the observations that follow use the analogous condition in the other types of physical change⁹).

de caelo I 9, 279a 22: Divine beings have the best life (*ζωήν*) and are not in need of anything while they continue *τὸν ἅπαντα αἰῶνα*. Aristotle next explains the meaning of *αἰών*,

established, Verdenius' arguments and efforts (in Ing. Düring [ed.], *Naturphilosophie bei Aristoteles und Theophrast*, Heidelberg, 1969, 272) to secure it notwithstanding. At 275b 23 I suggest that *εἰ οὖν [τὸ] κατὰ φύσιν καὶ παρὰ φύσιν ἐνδέχεται κινηθῆναι... is the correct conclusion to the argument which begins at a 18.*

9) For I 9, 278a 28 ff. the corrections I propose will now be found in *Kleine Schriften* (Hildesheim, 1968) I. 434. Verdenius who considers them unnecessary (loc. cit., n. 8, 273) fails to take Simplicius' paraphrase into consideration. What he says about Greek usage may be correct but is hardly to the point, since Aristotle clarifies the relation of *σάρε* to *γορηπότης* in a special clause.

a word that strikes him as “inspired”: τὸ γὰρ τέλος τὸ περιέχον τὸν τῆς ἐκάστου ζωῆς χρόνον... αἰὼν ἐκάστου κέκληται. κατὰ τὸν αὐτὸν δὲ λόγον καὶ τὸ τοῦ παντὸς οὐρανοῦ τέλος καὶ τὸ τὸν πάντα χρόνον καὶ τὴν ἀπειρίαν (i. e. infinite time) περιέχον [τέλος] αἰὼν ἐστίν, ἀπὸ τοῦ αἰεὶ εἶναι εἰληφῶς τὴν ἐπωνυμίαν, ἀθάνατος καὶ θεῖος. I do not think I am insensitive to the sublime quality of the style but I cannot persuade myself that the repetition of τέλος contributes to this quality. In the preceding sentences we were introduced to τὸ τέλος τὸ περιέχον and learned incidentally to think of an individual’s lifetime as the (grammatical) object of περιέχον. Thus there can be no doubt that after τὸ... οὐρανοῦ τέλος the word τέλος must be the noun that is modified by περιέχον. The renewed occurrence of this noun is not only gratuitous but actually interferes with the enthusiastic tone kept up throughout this section¹⁰).

de caelo I 10, 280a 4: In the section 279b 32–280a 11 the repeated occurrence of τὸ αὐτό has created difficulties for the modern interpreters and may well be responsible for a corruption. Aristotle argues against those who defend Plato’s cosmogony in the *Timaeus* by comparing it with the construction of a geometrical figure¹¹). On this view the cosmogony would be pedagogical rather than truly scientific in intention. Aristotle rejects the comparison: τοῦτο δ’ ἐστίν, ὥσπερ λέγομεν, οὐ τὸ αὐτό. He explains: ἐν μὲν γὰρ τῇ ποιήσει τῶν διαγραμματίων πάντων τεθέντων εἶναι ἅμα τὸ αὐτὸ συμβαίνει.... What does τὸ αὐτό mean here? In Moraux’ rendering: (in the construction of figures) “si l’on en suppose tous les éléments donnés simultanément, le résultat reste le même,” the last five words offer no light. More-

10) B9, 290a 34ff.: if the Pythagorean doctrine of a music performed by the heavenly spheres were correct the tremendous sounds ought not only to be heard but have still another effect: οἱ γὰρ ὑπερβάλλοντες ψόφοι διακναίονται καὶ τῶν ἀψύχων σωμάτων τοὺς ὄγκους, οἷον ὁ τῆς βροντῆς δίστησι λίθους καὶ τὰ κατερωτάτα τῶν σωμάτων. τοσοῦτων (scil. the bodies of the planets; cf. 290b 18ff.) δὲ φερομένων καὶ τοῦ ψόφου διόντος πρὸς (= in proportion to) τὸ φερόμενον μέγεθος, πολλαπλάσιον [μέγεθος] ἀναγκαῖον ἀφικνεῖσθαί τε δεῦρο καὶ τὴν ἰσχὴν ἀμήχανον εἶναι τῆς βίας. The noun to be supplied to πολλαπλάσιον is not once again μέγεθος but ψόφος. – At B 14, 296b 16 the disquisition regarding the terminus of a movement – is it the center of the Earth or the center of the Cosmos? – has reached its solution and the logic of the argument (which is too long to be quoted in full) requires: φέρεται ἅρα (γὰρ Mss.) καὶ ἐπὶ τὸ τῆς γῆς μέσον.

11) The target of his polemic is Xenocrates, as we know from Simplicius de caelo 303, 33ff. For further references see Moraux’s note ad loc. and Guthrie, HGPh. 5. 302f. and nn.

over from what follows in the Greek it will be seen that the attempt to connect *ἄμα* with *πάντων τεθέντων εἶναι* misses the point of the argument, for which contrary to appearances and first impressions *ἄμα* is more important than *τὸ αὐτό*¹²). Aristotle continues: *ἐν δὲ ταῖς τούτων ἀποδείξεσιν* (i. e. constructions of the Cosmos) *οὐ ταυτόν, ἀλλ' ἀδύνατον*. Here the comparison is once more rejected, while *ἀλλ' ἀδύνατον* points ahead to the proof that in the cosmogony *ἄμα* is inconceivable. The conditions posited for the original and for the later state of things are at variance: *τὰ γὰρ λαμβανόμενα πρότερον καὶ ὕστερον ὑπεναντία ἐστὶν ἐξ ἀτάκτων γὰρ ποτε τεταγμένα γενέσθαι φασίν, ἄμα δὲ τὸ αὐτὸ ἀτακτὸν εἶναι καὶ τεταγμένον ἀδύνατον, ἀλλ' ἀνάγκη γένεσιν εἶναι τὴν χωρίζουσιν καὶ χρόνον ἐν δὲ τοῖς διαγράμμασιν οὐδὲν τῷ χρόνῳ κεχώρισται*. The last sentence here written out states with all desirable clarity that the crucial question is whether there must be a time interval (which would of course exclude *ἄμα*). That the result of the construction is "the same" as the *τεθέντα* (or *λαμβάνόμενα πρότερον*) is asserted nowhere except in the sentence which causes trouble. In the two other sentences where *ταυτόν* (or *τὸ αὐτό*) occurs it relates clearly to the identity or comparability of geometrical and cosmological constructions. Giving *ἄμα* its proper weight I should read in a4: *πάντων τεθέντων εἶναι, ἄμα αὐτό* (i. e. the figure) *συμβαίνει*. The corruption may be due to a misunderstanding or to a mechanical adjustment; it is hardly necessary to suppose that besides *τὸ αὐτό* in the preceding (and in the following) clause *ὑπεναντία* too has contributed its share to the confusion.

de caelo I 12. 283a 11: Aristotle is combatting the theory that something that has been defined as indestructible (*ἀφθαρτον*) may yet at some time suffer destruction. The truth is that what is indestructible must last forever, i. e. an infinite time. After having brought forward other arguments he asks: *ἔτι τί μᾶλλον ἐπὶ τῷδε τῷ σημείῳ ἀεὶ ὄν πρότερον ἐφθάρη*.... The translators understand correctly: "why was it destroyed at this particular point of time

12) Guthrie's translation is open to the same criticism. Since the word *ἄμα* occurs only once (280a 7) in the argumentation designed to expose the absurdity of the opponents' comparison, the unfair deal which it has received at a4 may be excusable. Still the simultaneous existence of opposite condition is the crucial issue. At 280a 11 *ἄμα* is used for the different purpose of indicating a simultaneous championing of incompatible theories. Stocks does better: "the required figure forthwith results" but his explanatory note: "'the same' as that demanded in the *ὑπόθεσις*" fails to convince.

rather than at any other...”? However Aristotle’s way of expressing such thoughts is *μᾶλλον ἐπὶ τῷδε ἢ τῷδε τῷ σημείῳ*, which we do well to restore here. Cf. e. g. Phys. IV 8. 215 a 19f.: (in the void) *οὐδεὶς ἂν ἔχοι εἰπεῖν διὰ τί κινήθην στήσεται ποῦ· τί γὰρ μᾶλλον ἔνταυθα ἢ ἔνταυθα*; or III 4. 203 b 27.

de caelo II 12, 291 b 24f.: *δυοῖν δ’ ἀπορίαν οὐσαν, περὶ ὧν εἰκότως ἂν ὀσισοῦν ἀπορήσειε, πειρατέον λέγειν τὸ φαινόμενον, αἰδοῦς ἄξιαν εἶναι νομίζοντας τὴν προθυμίαν μᾶλλον ἢ θράσους, εἴ τις διὰ τὸ φιλοσοφίας διψῆν καὶ μικρὰς εὐπορίας ἀγαπᾷ περὶ ὧν τὰς μέγιστας ἔχομεν ἀπορίας*. In venturing on something for which the evidence is hardly sufficient Aristotle bespeaks the reader’s (or listener’s) indulgence. His attempt deserves to meet with *αἰδώς*. “evidence of modesty”, Guthrie’s rendering of *αἰδοῦς ἄξιαν*, does not do justice to Aristotle’s thought. Neither thirst for truth nor the venturing from a small basis of asserted facts into the realm of hypotheses can be regarded as “modesty”. And to translate *ἄξιαν* by “evidence” violates the meaning of this word. LSJ which puts the passage in a category of its own and proposes “more like modesty than rashness” does not help matters. Instead of coming forward with new meanings of *ἄξιος* we ought to recognize the impossibility of arriving at a satisfactory sense as long as we connect *ἄξιος* with the two genitives *αἰδοῦς* and *θράσους*. The remedy is to change *θράσους* to *θράσος*, making it a direct object of *νομίζοντας*. If the dual construction of *νομίζεν* which results from this change appears too zeugmatic for comfort it might be necessary to delete the article before *προθυμίαν*. To preserve the normal meaning of *ἄξιος* and leave the beautiful, remarkably personal sentiment of the passage undamaged¹³) I would be ready to make this additional change but I hardly think it necessary.

de caelo II 13, 294 b 31: The subject of the last two chapters of de caelo II is the Earth. Beginning in ch. 13 with its place in the Cosmos, Aristotle after a while (293 b 16) turns to the question whether it is at rest or in movement. This claims the larger part of ch. 13; for even what is said about the Earth’s shape (293 b 32–294 a 10) constitutes only a brief digression into a topic closely related to rest or movement. Immediately before this section at 293 b 30 Aristotle briefly refers to Plato’s suggestion (*Tim.* 40B) that the Earth performs a winding motion

13) For a similar defense of the philosophical *προθυμία* see B 5, 287 b 28–288 a 2. Note also 13, 294 a 11 ff.

around the axis of the world. After the digression he discusses and criticizes a variety of theories meant to account for the resting of the Earth. Although this discussion at 294a 10f. opened with the words: *καὶ γὰρ δὴ οἱ περὶ τῆς κινήσεως καὶ τῆς μονῆς εἰρημένον τρόποι πολλοὶ τυγχάνουσιν*, none of the *τρόποι* actually discussed favors movement, and it seems astonishing to see Aristotle conclude his criticism of the reasons given for *μονή* and turn to a fundamental principle in a sentence which reads (294b 30ff.): *ὅλως δὲ πρὸς τοὺς οὕτω λέγοντας περὶ τῆς κινήσεως οὐ περὶ μορίων ἐστὶν ἢ ἀμφισβήτησις, ἀλλὰ περὶ ὅλου τινὸς καὶ παντός*. None of the thinkers examined has spoken *περὶ τῆς κινήσεως* but the nature of *κίνησις* is the *ὅλον καὶ πᾶν* regarding which Aristotle finds himself at variance with these thinkers and which must be clarified before convincing explanations about the specific question of the Earth's remaining at rest can be advanced¹⁴). The sentence immediately following makes this clear: *ἐξ ἀρχῆς γὰρ διοριστέον πότερόν ἐστὶ τις τοῖς σώμασι φύσει κίνησις ἢ οὐδεμία, καὶ πότερον φύσει μὲν οὐκ ἐστὶ, βία δ' ἐστὶν*. Since this point of principle has been settled earlier and is in fact essential for Aristotle's entire cosmic system, he only needs to reaffirm the basic doctrines concerning natural movement and natural places of the elements (294b 34–295a 9). As a description of the issue at stake, the words *περὶ τῆς κινήσεως* which disturb us in 294b 31 are perfectly correct. That explanations of *prima facie* obscure expressions are at a later stage of the transmission incorporated in the text is a familiar phenomenon¹⁵).

In later passages of this chapter where Aristotle develops the implications of his tenets regarding natural movements two

14) Not astonishingly, even skillful translators find it difficult to do justice to the phrase *περὶ ὅλου τινὸς καὶ παντός*. Simplicius' exegesis is worth noting: *πρὸς τοὺς οὕτω λέγοντας περὶ τῆς κινήσεως τῆς γῆς ὡς οὐκ ἐχούσης κίνησιν* (526.10f. Heib.).

15) A passage where something similar has happened and where the intrusion of the explanatory remark into the text has likewise so far escaped detection is *de part. anim.* IV 5, 678a 28ff. Aristotle passes from the treatment of the blooded to that of the bloodless animals. The first major difference is *εὐθὺς γὰρ τὴν τῶν σπλάγγων ἄπασαν οὐκ ἔχει φύσιν*. He continues: *ὁμοίως δ' οὐδὲ τῶν ἄλλων ἀναιμῶν οὐδέν... ἐξ οὗ γὰρ συνέστηκεν ἡ τῶν σπλάγγων φύσις, οὐδὲν τούτων ἔχει [αἷμα] διὰ τὸ τῆς οὐσίας αὐτῶν εἶναι τι τοιοῦτον πάθος [αὐτῆς secl. Peck]. That some animals are *ἔναυμα* others *ἄναυμα* is included in their *οὐσία*. Here too *αἷμα* is the correct explanatory comment of a reader who could not wait for Aristotle himself to identify the substance of *σπλάγγνα*. I take a similar view of *Pol.* II 5. 1263a1 *τὰ περὶ τὴν κτῆσιν*.*

passages seem capable of improvement. I offer my suggestions with less confidence than at 294b 31. Both passages relate to the vortex or eddy (*δίνη* or *δίησις*), the theory so popular with the later Presocratics. In Aristotle's view it is misconceived since it introduces an "outside" factor and explains by "force" a behavior that is in the nature of the elements. 295a 9–12: *ὥστε εἰ βία ἢ γῆ μένει*, (which Aristotle does not consider true), *καὶ συνῆλθεν ἐπὶ τὸ μέσον φερομένη διὰ τὴν δίνησιν ταύτην γὰρ τὴν αἰτίαν πάντες λέγουσιν ἐκ τῶν ἐν τοῖς ὑγροῖς καὶ περὶ τὸν ἀέρα συμβαινόντων <λαμβάνοντες>*. The added participle provides support for the otherwise rather floating words *ἐκ... συμβαινόντων*. The other passage is 295b 3–6: *ἀλλὰ μὴν οὐδὲ τῆ δίνη γε τὸ βαρὺ καὶ τὸ κοῦφον <δι>ώρισται, ἀλλὰ τῶν πρότερον ὑπαρχόντων βαρέων καὶ κοῦφων τὰ μὲν εἰς τὸ μέσον ἔρχεται, τὰ δὲ ἐπιπολάζει διὰ τὴν κίνησιν*. Neither the idea that the vortex "defines" heavy and light (scil. by their different reactions to it) nor Aristotle's rejection of this idea would be inconceivable or pointless but the question at issue here is not their definition but the separation and the movement in opposite directions of heavy and light elements; see the concluding remarks 295b.6ff.: *ἦν ἄρα καὶ πρὶν γενέσθαι τὴν δίνην βαρὺ τε καὶ κοῦφον, ἃ τίτι διώριστο καὶ πῶς ἐπεφύκει φέρεσθαι ἢ ποῦ; ἀπείρου γὰρ ὄντος ἀδύνατον εἶναι ἄνω ἢ κάτω, διώρισται δὲ τούτοις τὸ βαρὺ καὶ κοῦφον*.

de caelo III 1, 300a 14. In the course of his extended polemic against Plato's construction (in *Tim.* 52) of the regular solid bodies from planes (*ἐπίπεδα*) Aristotle argues that if Plato were right it would be possible to resolve solid bodies into planes, planes on the same principles into lines, and lines (*γραμμαί*) into points (*στιγμαί*, 300a 7–10ff.), but at this final stage there would no longer be a body since points have no extension. The idea underlying this *reductio ad absurdum* is that just as points which have no extension cannot compose a line, lines cannot build up planes or planes bodies. By the same method, Aristotle continues in 300a 12, time could also be dissolved: *πρὸς δὲ τούτοις καὶ εἰ ὁ χρόνος ὁμοίως ἔχει, ἀναιροῦτ' ἂν ποτε ἢ ἐνδέχοιτ' ἂν ἀναιρεθῆναι τὸ γὰρ νῦν τὸ ἄτομον οἷον στιγμή γραμμῆς ἐστίν*. On the meaning of this sentence some light is shed by the disquisitions in *Physics IV* concerning the relation of the "now" to "time". The thought most relevant for the passage in *de caelo* is that the *νῦν* is not a "part" (*μέρος*) of time in the sense that a stretch of time could be composed of "nows": *τὸ δὲ νῦν οὐ μέρος μετρεῖ τε γὰρ τὸ μέρος, καὶ συγκεῖσθαι δεῖ τὸ ὅλον ἐκ τῶν μερῶν*

ὁ δὲ χρόνος οὐ δοκεῖ συγκαεῖσθαι ἐκ τῶν νῦν (IV 10, 218a 6–8)¹⁶. In *de caelo* 300a 14 we understand that in the hypothetical destruction (*ἀναίρεσις*) of time the νῦν would be the final stage of the process in which extension is no longer present. In this respect it does correspond to the *στιγμῆ* which, as we have learned, is the last stage in the resolving of bodies (*στιγμάς μόνον εἶναι, σῶμα δὲ μηθέν*, 300a 12) – and the last stage in the *reductio ad absurdum* of Plato's scheme. But to compare the νῦν in this argument to “a point of a line” fails to bring out its function in the structure – or the destruction – of time. If Aristotle in this brief reference to a possible similar “analysis” of time wished to make clear what part the νῦν plays in his thought experiment he is more likely to have referred to it as *οἷον στιγμῆ χρόνου*, “a point of time, as it were”.¹⁶)

De caelo III 2, 301a 5f.: Some cosmological systems including the *Timaeus* embody the assumption of “disorderly motion” before the formation of the *Cosmos*. After pointing out various difficulties or fallacies inherent in this assumption Aristotle comes forward with the following argument: *ἔτι τὸ ἀτάκτως οὐθέν ἐστιν ἕτερον ἢ τὸ παρὰ φύσιν ἢ γὰρ τάξις ἢ οἰκεία αἰσθητῶν φύσις ἐστίν. ἀλλὰ μὴν καὶ τοῦτο ἄτοπον καὶ ἀδύνατον, τὸ ἄπειρον ἄτακτον ἔχειν κίνησιν*. The translators are at one in giving the word *ἄπειρον* a temporal sense (“disorderly movement, infinitely continued”, Stocks; “disorderly motion continuing infinitely” Guthrie; “un mouvement désordonné infini”, Moraux). That we need this sense becomes evident in the sentences immediately following: *ἔστι γὰρ φύσις ἐκείνη τῶν πραγμάτων οἷαν ἔχει τὰ πλείω καὶ τὸν πλείω χρόνον συμβαίνει οὖν αὐτοῖς τοῦναντίον τὴν μὲν ἀταξίαν εἶναι κατὰ φύσιν, τὴν δὲ τάξιν καὶ τὸν κόσμον παρὰ φύσιν καίτοι οὐδὲν ὡς ἔτυχε γίγνεται τῶν κατὰ φύσιν* (a7–11). But prior to 301a 6 we read of the *ἄπειρον* (300b 31; cf. 10), *ἄπειρα κινούμενα* and *κινούμενα* (300b 31f.; 33f.), *ἀπείρουσ φοράς* (301a 1) and it is not easy all at once and without any warning to shift to a temporal sense. Simplicius' paraphrase:

16) Cf. also for the parallel place of the νῦν in time and the *στιγμῆ* in a body *Phys.* IV 11, 220a 5ff., esp. 9–11, and 18ff.: *καὶ ἔτι φανερόν ὅτι οὐδὲν μέρος τὸ νῦν τοῦ χρόνου... ὥσπερ οὐδ' ἡ στιγμῆ τῆς γραμμῆς*. The point is not a “part” of the line. The phrasing of this passage which outwardly resembles that in *de caelo* does nothing to support the reading of the Mss. True support is provided by Simplicius' commentary in *de caelo* (579.16 Heib.) where *οἷον στιγμῆ γραμμῆς ἐστίν* is quoted. This may cause hesitation, at least before one remembers that there are errors common to the Mss and late ancient commentators.

...ἀτοπον καὶ ἀδύνατον τὸ ἀπειρον ἐν ἀπείρῳ χρόνῳ ἄτακτον ἔχει κίνησιν (589. 11) sets us wondering whether he knew two readings, τὸ ἀπειρον and τὸ ἀπείρον χρόνον? Or two interpretations of the word ἀπείρον in 301a 7? And did he conflate either the readings or the interpretations? Without indulging longer in such speculations we may as well decide to introduce the necessary but far from obvious temporal meaning by the addition of the crucial word: τὸ ἀπείρον <χρόνον> ἄτακτον ἔχει κίνησιν. An alternative change: τὸ ἀπείρον <χρόνον τὸ ἀπείρον> ἄτακτον ἔχει κίνησιν may also have its attractions but I see no need for making the ἀπείρον the grammatical subject for the disorderly movements¹⁷).

Metaph. A 2, 1069b 20ff. γένεσις, as Aristotle here once again sets forth comes to pass ἐκ μὴ ὄντος as well as ἐξ ὄντος; for the matter from which a particular object arises exists as an ὄν but with reference to what develops from it this existence is only potential, not actual (...ἐξ ὄντος γίγνεται πάντα, δυνάμει μόντοι ὄντος, b 19f.). What follows reads in Ross's edition (Oxford, 1924): καὶ τοῦτ' ἔστι τὸ Ἀναξαγόρου ἐν βέλτιον γὰρ ἢ "ὁμοῦ πάντα" – καὶ Ἐμπεδοκλέους τὸ μίγμα καὶ Ἀναξिमάνδρου, καὶ ὡς Δημόκριτός φησιν – "ἦν ὁμοῦ πάντα δυνάμει, ἐνεργεία δ' οὐ". ὥστε τῆς ὕλης ἂν εἶεν ἡμμένοι. The grammatical subject for εἶεν ἡμμένοι is of course the Presocratic thinkers previously referred to. Jaeger's text (Oxford, 1957) differs from Ross's in having ἦν μὲν πάντα δυνάμει, ἐνεργεία δ' οὐ instead of ἦν ὁμοῦ πάντα... μὲν is Jaeger's own conjecture for ἡμῖν, the reading common to all Mss, except that E, one of the two leading codices has also ὁμοῦ with the addition of γρ. ὁμοῦ has enjoyed an astonishing favor with the editors until Jaeger pointed out that it stands in the way of what Aristotle means to say¹⁸). His μὲν which is probably the best correction of the impossible ἡμῖν removes one difficulty but others remain. If Aristotle here as so often makes the point that the Presocratics have grasped the material principle (or the

17) On the text of de caelo III 4, 303a16 where after ἀπειρα . τὰ σχήματα (scil. of the atoms for the Abderites, a11 f.) I propose to read: ὡς οὖσαν αὐτὴν (αὐτῶν Mss.) τὴν φύσιν οἷον πανσπερμῶν πάντων τῶν στοιχείων, see *Phronesis* 22 (1977), 278 n. 59.

18) non omnia 'potentialiter mixta' fuisse sed omnia 'potentialiter exitisse' mavult Ar[istoteles] explains Jaeger in the apparatus ad loc. All I could add is that it is hard to imagine what meaning Aristotle might have associated with ὁμοῦ πάντα δυνάμει. At b 29ff. he declares the ὁμοῦ to be inadequate. Not this but the existence δυνάμει is his idea of ὕλη. Everything may be visualized in a state of potentiality before it actually comes to be.

material cause), it can hardly be right to place most of their doctrines between dashes, a device whose use in our texts frequently makes one wonder whether there was anything analogous to help the Greek readers. Moreover granting that the sentence *ἦν μὲν πάντα... δ' οὐ* represents Aristotle's own position and that it is pointed especially but, after *ὁμοῦ* is removed, no longer exclusively against Anaxagoras, the passage embodies two thoughts whose mutual relation is far from comfortable. One of these thoughts is that the Presocratics were headed for the material principle; this would be expressed as follows: *καὶ τοῦτ' ἔστι τὸ Ἄν. ἐν [βέλτιον γὰρ ἢ "ὁμοῦ πάντα"] καὶ Ἐμπ... φησιν [ἦν μὲν ... δ' οὐ]. ὥστε τῆς ὕλης ἂν εἶεν ἡμμένοι, ὕλης* being for Aristotle in this context equivalent to potentiality. The second thought is to be found in the clauses that I have bracketed for the reconstruction of the first: *βέλτιον γὰρ ἢ "ὁμοῦ πάντα" "ἦν μὲν π. δ., ἐν. δ. οὐ"*. To avoid the awkward interruption of one thought by parts of the other I suggest transposing the words *βέλτιον γὰρ ἢ ὁμοῦ πάντα* to the more appropriate place immediately before "*ἦν μὲν πάντα...*" What results: *βέλτιον γὰρ ἢ "ὁμοῦ πάντα" "ἦν μὲν πάντα δυνάμει, ἐνεργείᾳ δ' οὐ"* may easily be an afterthought of Aristotle noted down in the margin (or whatever corresponded to it)¹⁹); when incorporated in the text, the note was split, perhaps by accident, perhaps owing to a misunderstanding of someone who took the words *βέλτιον γὰρ ἢ "ὁμοῦ πάντα"* to show that Aristotle preferred a simple *ἐν* to the more familiar description of the initial state of things in Anaxagoras²⁰).

Diog. Lart. III 73. Is it really the case that the necessary addition of one word in the report about Plato's doctrines: *χρόνον τε γενέσθαι εἰκόνα τοῦ αἰδίου (αἰῶνος)* has not yet been suggested? Cf. Pl., Tim. 37d 5.

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19) Cf. e.g. Moraux's remarks about "Nachträge." AGPh 43 (1961), 37ff. and Jaeger in the praefatio to his edition XVIIff.

20) The somewhat unusual descriptions which Aristotle in this passage offers for the initial state of some Presocratics – Anaximander's *μῦγμα*, Anaxagoras' *ἐν* – are satisfactorily accounted for by Ross, ad loc. – Consideration might be given to the possibility that the "afterthought" is rather the passage which Ross and Jaeger place between dashes. This is less likely because as the last sentence quoted shows Aristotle has in mind more than one Presocratic.