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Anaximenes' ἀήρ as Generating Mist and Generated Air

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Abstract: Anaximenes is usually considered to be a material monist recognizing transparent atmospheric air as a principle (ἀρχή). In the cosmogonic explanation of the origin of the earth and the heavenly bodies, the Greek term ἀήρ turns out to mean rather 'opaque damp mist'. However, Not only does it accord with archaic usage, but also with how it was used in his mentor, Anaximander. Yet, in cosmology ἀήρ means 'air' serving as stuff on which the earth and the heavenly bodies float. Hence, in keeping with contemporary usage, Anaximenes recognised two kinds of ἀήρ, distinguishing them functionally. Whereas mist is conceived of as a *generating* substance, air functions only as *carrying* stuff.

Keywords: Greek philosophy, Anaximenes, elements, air, theory of change, cosmogony

According to the usual account Anaximenes, the third and last Milesian philosopher, should have taken air (ἀήρ) to be the principle (ἀρχή) of the world (Arist. Met. 984a5–7; Simp. Phys. 24, 26–25, 1 = DK 13 A 5).¹ He is thus generally considered to be a material monist.² Air can undergo a series of changes, being either rarefied into fire or condensed into earth or even stones. That is why one attributes to Anaximenes a theory of change, which is often seen as his most important philosophical or even scientific achievement.³

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2 W. K. C. Guthrie, *A History of Greek Philosophy*, I, *The Earlier Presocratics and the Pythagoreans* (hereafter Guthrie, *History*), Cambridge: Cambridge University Press 1962, 115–116; J. Barnes, *The Presocratic Philosophers*, London: Routledge 1982, 38–47; G. S. Kirk, J. E. Raven, M. Schofield, *The Presocratic Philosophers* 2nd edition (hereafter KRS), Cambridge: Cambridge University Press 1983, 75.

3 J. Burnet, *Early Greek Philosophy* 4th edition (hereafter, Burnet, *EGP*), London: Adam and Charles Black 1930, 77–78: 'the introduction of rarefaction and condensation into the theory is a notable advance. In fact, it makes the Milesian cosmology thoroughly consistent for the first time; since a theory which explains everything as a form of a single substance is clearly bound

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However, if we realize that the only surviving textual evidence from Anaximenes (as well as from other Milesians) are – in Diels' words – *testimonia* (i. e. not original texts or direct quotations), the usual account of his thought based on his material monism and/or theory of change⁴ is a far cry from being sure. First of all, Aristotelian terminology is the prime suspect. As is well-known, the notorious term ἀρχή has a clear Aristotelian coinage,⁵ and the nouns designating the processes of rarefaction (μανότης) and condensation (πυκνότης, *Simp. Phys.* 24, 29 = *DK* 13 A 5) seem to be of Aristotelian origin too.⁶ In my paper I will not delve into these issues in detail. They have been closely examined by others. Instead, I will focus primarily on the nature of Anaximenes' ἄēr, arguing that he took it to mean not only 'air' but particularly 'mist'. Accordingly, the usual, more or less ontological interpretation of Anaximenes as a material monist and/or a theorist of change would have to be reassessed. Since the ontological interpretation seems to justify Anaximenes' reputation as one of the founders of western philosophy, one might be worried that by denying his ontological preoccupation we would demote Anaximenes to a second-order thinker. Although my paper is rather critical (for I am concerned primarily with a critical reading of extant information), I hope to suggest that Anaximenes' contribution has been significant and profound, lying in devising a unique cosmogonic and cosmologic model of the world. In other words, instead

to regard all differences as purely quantitative.' C. J. Classen, 'Anaximander and Anaximenes: The Earliest Greek Theories of Change?', *Phronesis* 22 (1977) 89–102, at 102: 'While Anaximander simply applied notions of coming-to-be familiar from processes in nature, Anaximenes developed a more subtle conception with traces of reflection on the mechanism of change. (...) It is to him, therefore, that Aristotle was indebted for suggestions on the problems of change and that we owe the earliest traces of a theory of change.' W. D. Graham, *Explaining the Cosmos: The Ionian Tradition of Scientific Philosophy* (hereafter Graham, *Cosmos*), Princeton, NJ: Princeton University Press 2006, 41–42: 'What Anaximenes is renowned for is his theory of change, which assigns a regular sequence of changes for air as well as a mechanism for action. (...) It is this theory, more than any other, that put Ionian inquiry on the path toward scientific thinking.'

⁴ Anaximenes' theory of change is usually taken to be closely connected with, or even a result of, his material monism. Graham, however, makes a strong case against it, considering the theory of change to be his prime achievement (Graham, *Cosmos*, 41–71).

⁵ H. Cherniss, *Aristotle's Criticism of Presocratic Philosophy* (hereafter Cherniss, *Criticism*), Baltimore: The Johns Hopkins Press 1935, 1–143; E. A. Havelock, 'Linguistic Task of the Presocratics' (hereafter Havelock, 'Linguistic Task') in: K. Robb (ed.), *Language and Thought in Early Greek Philosophy*, 7–82, La Salle: Hegeler Institute 1983, 57–59; M. Schofield, 'APXH', *Hyperboreus* 3 (1997) 218–235.

⁶ Havelock, 'Linguistic Task', 60–62, points out that Anaximenes could have used the adjectives 'rare', 'thin', 'condensed', but not the nouns 'rarefaction' or 'condensation' designating the abstract processes.

of seeing the hallmark of his thought in ontological implications of his alleged material monism and/or theory of change, it consists in cosmogonic and cosmological explanations.⁷

Anaximenes' Air and Aristotelian Tradition

It is commonly assumed that Anaximenes' ἀήρ is transparent atmospheric air. What evidence do we have for this assumption? The Greek word ἀήρ is by itself ambivalent, meaning both 'air' and – primarily in the archaic times in which Anaximenes lived and thought – 'mist' or 'vapour'.⁸ That Anaximenes might have used it in the archaic meaning 'mist' can be borne out by the fact that his predecessor and (probably) mentor, Anaximander, did use it precisely in this way.⁹ He conceived of the heavenly bodies (sun, moon, stars) not as gleaming masses (as we are

7 I am very grateful to the anonymous referee whose helpful criticism and suggestions forced me to once more rethink my interpretation and make some of my points more clear.

8 P. Louis, 'Sur le sens du mot AHP chez Homère' (hereafter Louis, 'AHP'), *Revue de Philologie* 22 (1948) 63–72.

9 Usually the difference in the meaning of ἀήρ in Anaximander and Anaximenes is stressed, cf. Ch. H. Kahn, *Anaximander and the Origins of Greek Cosmology* (hereafter Kahn, *Anaximander*), New York: Columbia University Press 1960, 147: 'How did this new sense of ἀήρ develop from the idea of ,mist'? There are at least two possibilities. (...) a gradual extension of meaning took place within the spoken language of Ionia and Athens. (...) But it may also have been the philosophers who first felt the need for a term to correspond to the new conception of the atmosphere.' Guthrie, *History*, 126: 'With him [Anaximenes] the word *aer* first comes to mean, in its primary significance, the invisible substance around us which we call air today. (...) Hitherto the word *aer* had generally signified mist, fog or darkness – something at least which obscured the vision and hid any objects which it surrounded.' As far as I know, only two commentators stress that the use of ἀήρ in both Anaximander and Anaximenes should be the same. M. C. Stokes, 'Hesiodic and Milesian Cosmogonies, II' (hereafter Stokes, 'Cosmogonies'), *Phronesis* 8 (1963) 1–34, at 13: 'it is conceivable, though improbable, that Air did not mean the same thing to both of them.' A. Finkelberg, 'Anaximander's conception of the *apeiron*' (hereafter Finkelberg, 'Anaximander'), *Phronesis* 38 (1993) 229–256, at 237: 'Anaximenes' notion of ἀήρ is clearly of direct and extreme relevance for the understanding of Anaximander. As a younger contemporary and fellow-townsmen Anaximenes must have shared in the same stock of popular ideas as reflected in the local linguistic idiom. The assumption that Anaximander's notion of ἀήρ did not essentially differ from Anaximenes' is then the most natural and plausible one.' Interestingly, both construe the meaning of ἀήρ in Anaximander and Anaximenes differently. Whereas Finkelberg ('Anaximander', 240) takes it to mean in both thinkers 'dry atmospheric air', Stokes ('Cosmogonies', 27) concludes that 'the balance of probability is in favour of the supposition that Anaximenes' air was conceived of as a mist, as something dark and opaque.' Although Stokes' and Finkelberg's conclusions are by themselves extreme and as such

accustomed today) but as fiery apertures in tube-like circles or rings. The circles likened to chariot wheels are made up by ἄρηρ and filled with fire, which is emitted from the apertures (Aët. II, 20, 1 = DK 12 A 21; Hippol. Ref. I, 6, 4–6). Here ἄρηρ clearly means ‘opaque mist’. Otherwise, we would see fiery stripes of the heavenly circles in the sky. In addition to astronomy, ἄρηρ as mist appears to play an important role in Anaximander’s cosmogony as well. For, at the beginning of the cosmogonic process, two basic elements (ἄρηρ and πῦρ), from which the world has been formed, were separated off from the primeval mass (Ps.-Plut. *Strom.* 2 = DK 12 A 10). In contrast to warm dry fire ἄρηρ is to be interpreted as cold damp mist.¹⁰

Anaximander’s (cosmological and cosmogonic) precedent strongly supports the interpretation of Anaximenes’ ἄρηρ as opaque damp mist. That Anaximander’s archaic notion of ἄρηρ is not taken into account in reading Anaximenes seems to be primarily connected with Aristotle, who unequivocally took it to mean ‘transparent atmospheric air’. Since there are no surviving texts or direct quotations from the Milesians, Aristotle, who was the first to explicitly refer to and comment on them, has had enormous impact on the subsequent interpretations of their thought, i. e. on the doxographical tradition starting with Theophrastus’ lost writing on the *Physical Tenets* (Φυσικαὶ δόξαι).¹¹ As to Aristotle’s approach to his predecessors, he is primarily interested in how they contributed to the pursuit of truth. He does not then seem to distinguish between a historical study (in our sense) and a systematic or scientific inquiry into the nature of the things.¹² The investigation of his predecessors is thus a

unacceptable, their insistence that Anaximander and Anaximenes used ἄρηρ in the same way is revealing.

10 Kahn, *Anaximander*, 87; Guthrie, *History*, 92; Stokes, ‘Cosmogonies’, 9–11. That Finkelberg (‘Anaximander’, 238–240) can construe Anaximander’s ἄρηρ as air is because he concentrates on Anaximander’s meteorology (where its role may not be unequivocal) and omits the interpretation of the heavenly bodies.

11 For the issue of the precise title of Theophrastus’ lost writing, the nature of the doxographical tradition and its dependence on Aristotle see J. Mansfeld, ‘*Physikai doxai* and *Problemata physika* from Aristotle to Aëtius (and Beyond)’ (hereafter Mansfeld, ‘*Physikai doxai*’), in: W. W. Fortenbaugh, D. Gutas (eds.), *Theophrastus. His Psychological, Doxographical, and Scientific Writings*, 61–111, New Brunswick, NJ: Transaction 1992 (slightly revised version in: J. Mansfeld, D. T. Runia, *Aëtiana. The Method and Intellectual Context of a Doxographer*, III, Leiden: Brill 2010, 33–98). See also J. Mansfeld, ‘Doxography of Ancient Philosophy’, in: E. N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), URL = < <https://plato.stanford.edu/archives/win2016/entries/doxography-ancient/> >; J. Mansfeld, D. T. Runia, *Aëtiana. The Method and Intellectual Context of a Doxographer*, I–III (hereafter Mansfeld, Runia, *Aëtiana*), Leiden: Brill 1997–2010.

12 For Aristotle’s approach to his predecessors see W. A. Heidel, ‘Qualitative Change in Pre-Socratic Philosophy’, *Archiv für Geschichte der Philosophie* 19 (1906) 333–379; Cherniss,

part of his philosophical or scientific method that, as Owen has pointed out, has largely dialectical character.¹³ Since the dialectic starts from the so-called *endoxa* or the 'acceptable or noted opinions', the views of his predecessors primarily serves as a source of various *endoxa* required for the (philosophical or scientific) inquiry. A passing look at how Aristotle used the views of his predecessors suggests that he felt quite free in dealing with them. His attitude to them can be well illustrated by a telling example from the first book of his *Metaphysics*, which, moreover, bears direct relevance to Anaximenes' ἀήρ.

The first book of the *Metaphysics* contains Aristotle's largest and most thorough treatment of his predecessors. With the exception of the first two chapters, dealing with wisdom (σοφία) or the highest knowledge, the remaining eight chapters are devoted exclusively to the study of his predecessors. At the beginning of the third chapter Aristotle assures that the goal of his inquiry is not a historical one (e. g. to investigate what his predecessors actually spoke and thought) but rather a philosophical one, namely, to find out whether his theory of four causes, explicitly referred to immediately at the beginning of the third chapter, is correct or not (*Met.* 983b5–6). Since – as he established in the first two chapters – all knowledge is based on causes and principles (ἀρχαί), he wants now (from the third chapter on) to investigate whether a different notion of causes cannot be found in his predecessors, in which case his own conception would have had to be modified and corrected, if not even dismissed. Since in his investigation he proceeds dialectically,¹⁴ the views of his predecessors are meant to be the *endoxa*.

According to Aristotle there are four kinds of causes (983a26–32). The first philosophers, however, recognised only material causes or principles (983b7). Thales (whom Aristotle considers to be the first philosopher) should have acknowledged water (ὕδωρ) to be the material principle (983b20–21), similarly Hippon (984a3–5); Anaximenes and Diogenes air (ἀήρ, 984a5–7); Hippasus and Heraclitus fire (πῦρ, 984a7–8). Some recognized other kinds of causes, e. g. the

Criticism, and the review of his book by W. Jaeger in *The American Journal of Philology*, 58 (1937), 350–356; W. K. C. Guthrie, 'Aristotle as a Historian of Philosophy: Some Preliminaries', *The Journal of Hellenistic Studies* 77 (1957) 35–41; J. G. Stevenson, 'Aristotle as Historian of Philosophy', *The Journal of Hellenic Studies* 94 (1974) 138–143. See also the preceding and following note.

¹³ G. E. L. Owen (ed.), 'Tithenai ta phainomena', in: *Logic, Science and Dialectic. Collected papers in Greek philosophy*, 239–251, London: Duckworth 1986; T. Irwin, *Aristotle's First Principles*, Oxford: Clarendon Press 1988; M. C. Nussbaum, *The Fragility of Goodness*, Cambridge: Cambridge University Press 2001, 240–263 ('Saving Aristotle's Appearances').

¹⁴ R. Barney, 'History and Dialectic in *Metaphysics A 3*', in: C. Steel (ed.), *Aristotle's Metaphysics Alpha*, 69–104, Oxford: Oxford University Press 2012.

efficient one (984a19–27). In any case, since Aristotle defines the material cause or principle as that ‘of which things consist and from which they come to be’ (ἐξ οὗ γὰρ ἔστιν ἅπαντα τὰ ὄντα καὶ ἐξ οὗ γίγνεται, 983b8–9), he determines the philosophical pursuit of the first philosophers as their inquiry into the material origin and nature of the things, thus inventing the popular story of the Milesian search for the primordial matter (*Urstoff*) or a generating substance. But whereas in case of the Milesians, from which no original texts or direct quotations survived, the story seems to hold (not only are we quite accustomed to it but we do not have any additional evidence against which to judge it), the extant fragments of Heraclitus strongly defy Aristotle’s interpretation. Although Heraclitus actually speaks of fire (*DK* 22 B 30; B 31; B 76; B 90), he does not demonstrably use it in the materialistic sense Aristotle ascribes to him. In Heraclitus’ dark, often deliberately paradoxical way of thought fire symbolizes continuous changes, discharging tensions lying behind the struggle of opposite forces or even the life itself rather than a materialistic source of the world.¹⁵

Now, imagine that we knew Heraclitus’ thought only by way of Aristotle’s report (everything else being lost). What a different and distorted picture of him we would have! But if Aristotle does not bother with the historical accuracy of Heraclitus’ philosophy, why should we trust him in the case of Anaximenes’ ἀήρ he took to mean ‘transparent atmospheric air’? It is quite conceivable, even probable, that he may have misconstrued it too. Still, before we dare to make this assumption, we should be able to explain why he took it to mean ‘air’, and what Anaximenes originally meant by it (given he actually used it).

As we have seen above, the material causes Aristotle attributes to those Presocratics whom he considers to be the material monists (e.g. Thales, Anaximenes, or Heraclitus), are the basic elements like water, air and fire. Such elements had always been a part of philosophical or even pre-philosophical thought. However, as Heraclitus’ case suggests, Aristotle seems to have identified them with his own theory of four elements, which are indeed the

¹⁵ For combining fire with the unique style of Heraclitus’ thought departing from the alleged Milesian scientific spirit see Ch. H. Kahn, *The art and thought of Heraclitus*, Cambridge: Cambridge University Press 1979, 138: ‘Fire is indeed a mysterious symbol of life (...). Thus in representing life and creativity it also represents death and destruction. As an altar flame consuming the sacrifice, it represents the gods. As fire for cooking and for warmth in winter it sustains human life. As instrument of the arts, the stolen gift of Prometheus, it points to the divine element in human activity, the techniques and industry that separate us from the animals. Fire has many qualities. But it is a most unlikely choice for a starting point in a literal account of the development of the world in material terms, since it is not in itself a kind of matter, not a body at all, but a process of transition from one state to another, a symbol of life and death at once, the very element of paradox.’

basic material constituents of the world (at least for him). We may then suspect that Aristotle identified Anaximenes' ἀήρ with one of his own elements, namely, transparent atmospheric air, completely ignoring its original meaning. But, in addition to Heraclitus' case, do we have any other support for this suspicion?

That Aristotle actually interprets those whom he considers to be material monists by means of his own theory of four elements may be borne out by the puzzling intermediate element or substance, which he attributes to some of them and which he thinks of as being between fire and water, between fire and air, or between air and water.¹⁶ To understand what he means by it and why he introduces it, let us look more closely on his theory of four elements. He conceives of them as consisting of form and matter (*De gen. et cor.* II,1 329a24–b3). Whereas their matter is a kind of substratum for their mutual change, the form is a combination of two opposites (ἐναντιώσεις, 329a26, 34), which constitute two basic pairs of opposite qualities: hot–cold, dry–moist (*De gen. et cor.* II,2).¹⁷ Since the form of each element combines two of these qualities, only four elements can logically (κατὰ λόγον, 330b7) exist; the combination of two opposite qualities would result in contradiction and is therefore excluded.

Although Aristotle refers to the monistic intermediate element nine times,¹⁸ he nonetheless never names any thinker who actually puts it forward. He restricts himself at most to three vague utterances that someone or some thinkers do (τινες, *Met.* 988a31; *De gen. et corr.* 332a25; οἱ δ' *De caelo* 303b12). Usually, it is assumed that Aristotle had Anaximander in mind.¹⁹ Not only does he twice describe the intermediate element as τὸ ἄπειρον (*De gen. et cor.* 332a22–25) or ἄπειρον ὄν (*De caelo* 303b13), but primarily, Theophrastus takes Anaximander's which is indefinite, i. e. as different from the four Aristotelian elements principle to be τὸ ἄπειρον (ἄλλο τι τῶν καλουμένων στοιχείων, *Simp. Phys.* 24,16 = DK 12 A 9). Anyway, Aristotle's reluctance to name Anaximander (or whomever he had in mind) has to be accounted for. To begin with, Aristotle's usual interpretation of Anaximander is different from, even contradictory to, Theophrastus'. Not only does Theophrastus, unlike Aristotle, attribute to Anaximander the concept τὸ ἄπειρον, but crucially counts him as a *monist*,

¹⁶ Kahn, *Anaximander*, 44–46.

¹⁷ H. H. Joachim, *Aristotle. On Coming-To-Be and Passing-Away*, Oxford: Clarendon Press 1926, 198–199.

¹⁸ *Met.* I,7 988a30; *Met.* I,8 989a14; *Phys.* I,4 187a14; *Phys.* I,6 189b3; *Phys.* III,4 203a18; *Phys.* III,5 205a27; *De gen. et corr.* II,1 328b35; *De gen. et corr.* II,5 332a20–22; *De Caelo* III,5 303b12.

¹⁹ Kahn, *Anaximander*, 44–46; KRS, 111–113; Graham, *Cosmos*, 30–32. For the contrary notion see M. Conche, *Anaximandre. Fragments et Témoignages*, Paris: Presses universitaires de France 1991, 90–94.

acknowledging the *Apeiron* as his only principle (cf. τῶν ἐν λεγόντων, Simp. Phys. 24,13 = DK 12 A 9). Aristotle, on the other hand, considers him to be a *pluralist*, i. e. the one recognising the plurality of principles. He associates him firmly with Empedocles, whom he thinks of as a typical pluralist, and attributes to him a characteristic pluralistic concept of mixture (μίγμα, Met. 1069b22; Phys. 187a20–24). Note that for Aristotle's approach to his predecessors the difference, even contradiction between monists and pluralists is crucial (Phys. 184b15; 187a12–23; De gen. et cor. 314a8–13; 314b1–6; 328b33–329a5).

Why do Aristotle's and Theophrastus' accounts of Anaximander differ so profoundly? If, as Theophrastus suggests, the *Apeiron* is really of indefinite nature (being identical with none of the four Aristotelian elements), it could not only correspond to Aristotle's mysterious intermediate element, but in a broad sense also suit his description of mixture. Our accounts of Anaximander suggest that something is separated off from the *Apeiron*, namely, some opposites (ἐναντιότητος, Arist. Phys. I,4 187a20) or perhaps even elements like ἀήρ and fire (Ps.-Plut. Strom. 3 = DK 12 A 10). If so, those elements have to be contained in the mixture which, in turn, might appear as something indefinite or even as an indefinite element, being identical with none of the four Aristotelian elements. However, even though the mixture might look indefinite, it still contains the qualities of the separating elements. Hence, the indefinite mixture or element might appear as something in between those two elements, which corresponds to Aristotle's description of the intermediate element as something in between two elements like fire and air, fire and water etc.

Now, if according to Aristotle only four elements can in fact exist, then the intermediate one cannot. If we further realize that the views of the predecessors serve Aristotle as *endoxa*, i. e. as parts of his own philosophical or scientific search for the truth, it would not have made much sense for him to use a non-existent entity in his own research. Theophrastus might not have been bothered about the actual existence of the *Apeiron*, which is why he did not hesitate to attribute it to Anaximander, but because of his strong scientific preoccupation Aristotle could have been.²⁰ At any rate, that would explain why Aristotle

20 Some commentators think that Theophrastus is a more reliable historian of philosophy than Aristotle. If so, that could explain the differences of their interpretations of Anaximander (Kahn, *Anaximander*, 17–22). However, Theophrastus is not a historian. His approach to his predecessors is not a historical, but rather a doxographical one. To assess the issue let us consider the title of his lost writing on his predecessors. Usually it is rendered as Φυσικῶν δόξαι (*The Tenets of the Philosophers of Nature*). If so, Theophrastus' concern is historical, since he is interested in the tenets of the particular philosophers. Yet, as Mansfeld has pointed out, it should be rendered as Φυσικαὶ δόξαι (*The Tenets in Natural Philosophy*), which suggests that he was interested only in various views about the physical world, and not in the views of the particular

prefers to ascribe to Anaximander a concept of mixture (which is an essential part of his own scientific doctrine) rather than a non-existent element. Moreover, Aristotle might have been reluctant to name any advocate of the intermediate element as well since he did not want to attribute to someone an element that, unlike his four, does not in fact exist.

To sum up, if we take into account Aristotle's reading of Heraclitus' fire and his treatment of the puzzling intermediate element, he seems to aim to interpret his predecessors by means of his own concepts. Not only is this conclusion in accordance with the goal of his investigation in the first book of the *Metaphysics* referred to above (namely, that he deals with his predecessors only in order to corroborate his own theory, i. e. that of four causes, 983b5–6), but also matches his notion of *endoxa*. So Aristotle could have easily misconstrued the original meaning of Anaximenes' ἀήρ to tailor it to his own conceptual schema. Although we do not so far have positive evidence that he actually did, we have at least strong reasons to be very cautious in trusting his and the subsequent doxographical reports concerning Anaximenes' alleged principle (ἀρχή).

Two Kinds of ἀήρ

Let us now look at how Anaximenes uses the term ἀήρ. If we leave aside suspect Aristotelian reports of Anaximenes' alleged ἀρχή, we encounter ἀήρ in four types of testimonies or contexts: physiological, meteorological, cosmological, and cosmogonic.

First, according to one fragment, which is sometimes considered to be a direct quotation, Anaximenes should have taken ἀήρ to be soul (ψυχή) and breath (πνεῦμα, Aët. I, 3, 4 = DK 13 B 2). If so, ἀήρ has to mean 'transparent atmospheric air' we breathe. In fact, the identification of ἀήρ with soul or breath is one of the strongest reasons for taking it to mean 'air'. Unfortunately, commentators are irreconcilably divided as to whether the fragment contains a genuine core or not. Since it is not preserved in Ionic dialect, it cannot be a direct quotation. Furthermore, it contains words whose use in Anaximenes' time is doubtful. Hence, it is a paraphrase at best. Aëtius, who preserves it, is not a very reliable source. His reports correspond to the rules of doxographical genre

philosophers (Mansfeld, 'Physikai doxai', 67: 'My hypothesis is that Theophrastus' Φυσικαὶ δόξαι was a huge collection of materials to be used in dialectical and/or scientific discussion.'). Hence, the difference between Aristotle's and Theophrastus' interpretations of Anaximander might be explained only as a result of their different approaches to selecting and construing *endoxa*.

rather than historical truthfulness.²¹ So it may be justifiably suspected that the fragment has nothing to do with Anaximenes' own thought,²² being in fact only of peripatetic²³ or stoic²⁴ origin. It might also have been misconstrued by the identification of Anaximenes with the late Presocratic philosopher, Diogenes of Apollonia, who took air (ἀήρ) we breathe to be identical with soul (ψυχή) and intelligence (νόησις, *DK* 64 B 4). As we have seen above, Aristotle himself might have given rise to this identification (*Met.* 984a5–7).²⁵ Nevertheless, the physiological claim combining Anaximenes' ἀήρ with soul or breath, which is to be found in Aëtius' fragment, is by itself very dubious so the interpretation of such a crucial issue, as is the nature of his ἀήρ, cannot be based upon it.

Second, winds or clouds are said to be formed when ἀήρ is condensed or thickened (Hippol. *Ref.* I, 7, 7 = *DK* 13 A 7; Aët. III, 4, 1 = *DK* 13 A 17). Therefore, ἀήρ thought to be thinner than winds or clouds is to mean 'air' in its transparent atmospheric form. The accounts of how winds or clouds are formed seem to be in accord with Anaximenes' alleged list of seven elemental transformations, i. e. fire, air, wind, cloud, water etc. (Simp. *Phys.* 24, 29 = *DK* 13 A 5; Hippol. *Ref.* I, 7, 3 = *DK* 13 A 7). We will deal with Anaximenes' meteorology in the next section of our paper in more detail. For now, it is enough to remark that in comparison with other Ionian thinkers (Anaximander, Xenophanes and Heraclitus) Anaximenes' meteorological account looks quite peculiar. Of course, its peculiarity may be (and usually is) considered to be a consequence of his own philosophical approach. By the same token, it could be taken to be a result of the doxographical effort to tailor all aspects of his thought to his alleged material monism and/or theory of change. It is all the more probable if we realize that (as we will see) the list of elemental transformations is itself dubious. Hence, Anaximenes' meteorology cannot by itself provide a reliable clue for determining the meaning of ἀήρ.

21 K. Alt, 'Zum Satz des Anaximenes über die Seele. Untersuchung von Aëtios ΠΕΡΙ ΑΡΧΩΝ' (hereafter Alt, 'Satz des Anaximenes'), *Hermes* 101 (1973) 129–164; Mansfeld, Ruina, *Aëtiana*.

22 K. Reinhardt, *Parmenides und die Geschichte der griechischen Philosophie*, Bonn: Friedrich Cohen 1916, 175: 'Dagegen erweist sich als vollkommenes Phantasiestück das angebliche Fragment des Anaximenes, für dessen späten Ursprung übrigens ein jedes Wort und nicht zuletzt auch der Gedanke selber spricht.'

23 Alt, 'Satz des Anaximenes'.

24 K. Reinhardt, *Kosmos und Sympathie. Neue Untersuchungen über Poseidonios*, München: C. H. Beck'sche Verlagsbuchhandlung 1926, 209–213; J. Kerschensteiner, *Kosmos. Quellenkritische Untersuchungen zu den Vorsokratikern*, München: C. H. Beck'sche Verlagsbuchhandlung 1962, 72–83.

25 Alt, 'Satz des Anaximenes', 156–162.

Third, the heavenly bodies including the earth are reported to be carried on ἀήρ. If so, ἀήρ is to be construed as transparent atmospheric air; otherwise, the heavenly bodies (sun, moon, stars) would be shrouded in haze and we would not be able to see them. Whereas the earth is flat like a table in order to float on air,²⁶ the heavenly bodies are conceived of as flat fiery leaves capable of being carried by the wind.²⁷ Not only do we have reports about the carrying function of air (ἐποχεῖσθαι τῷ ἀέρι, Ps.-Plut. *Plac.* 3 = DK 13 A 6; Hippol. *Ref.* I, 7, 4 = DK 13 A 7; Aët. III, 15, 8), but also the shape and nature of the heavenly bodies seem to be adapted to floating, the earth's flatness being likened to a table (τραπεζοειδῆ, Aët. III, 10, 3), sun's flatness to a leaf (πέταλον, Aët. II, 22, 2) stars to fiery leaves (πέταλα πύρινα, Aët. II, 14, 4). The number and variety of cosmological testimonies concerning the carrying function of ἀήρ is indeed crucial evidence for taking it to mean 'air'.

Finally, we encounter ἀήρ in the only surviving report of Anaximenes' cosmogony which tells us that after ἀήρ had condensed (literally, had been felted πιλομένου), the earth emerged (Ps.-Plut. *Strom.* 3 = DK 13 A 6). So we learn that ἀήρ had constituted the primordial mass from which the world came to be. Usually, it is assumed that the primordial ἀήρ is the same as the carrying one

26 Cf. Arist. *De caelo* 294b13–21 = DK 13 A 20; Ps.-Plut. *Plac.* 3 = DK 13 A 6; Hippol. *Ref.* I, 7, 4 = DK 13 A 7; Aët. III, 10, 3; III, 15, 8.

27 Cf. Hippol. *Ref.* I, 7, 4 = DK 13 A 7; Aët. II, 13, 10 = DK 13 A 14; Aët. II, 14, 4; II, 22, 2. In addition to the flat fiery nature of the heavenly bodies being likened to leaves (capable of being carried by wind), some earthy bodies (e. g. meteoroids) might be found in the heavens (Hippol. *Ref.* I, 7, 5 = DK 13 A 7; Aët. II, 13, 10) or even the heavenly bodies themselves are twice reported to be of earthy or solid nature, the sun being earth (Ps.-Plut. *Plac.* 3 = DK 13 A 6) or stars being like nails (ἥλων) fixed to an ice-like surface (κρυσταλλοειδεῖ, Aët. II, 14, 3). However, as Graham has pointed out, these reports are distorted. D. W. Graham, *Science before Socrates. Parmenides, Anaxagoras, and the New Astronomy* (hereafter Graham, *Science before Socrates*), Oxford: Oxford University Press 2013, 80–81: 'The Ionians treat the heavenly bodies as continuous with phenomena in the lower atmosphere and in some way dependent on them. Heavenly bodies are formed out of exhalations, blown by winds or otherwise buffeted by atmospheric conditions, fueled by the exhalations, and liable to be extinguished by a dearth of fuel or a change of conditions.' He calls the Ionian astronomical views as the Meteorological Model. 'A new model of the heavens emerges in Anaxagoras, one very different from the Meteorological Model of the sixth century with its vapors, exhalations, and clouds supplying fuel and motion to heavenly conflagrations. In Anaxagoras we find earthy or stony bodies torn away from the surface of the earth and hurled violently in a turbine motion. The motion somehow generates heat, which is not that of the combustion of fuel. Besides luminous heavenly bodies there are dark bodies, invisible except when they collide or interpose themselves or fall out of orbit. Because of the central role of rocky bodies in this scenario, I shall call the new picture the Lithic Model. (...) Crucially, the new model makes hardly any connections between meteorological phenomena and heavenly bodies.' (135)

from cosmology, being transparent atmospheric air. This assumption is largely a consequence of Anaximenes' alleged material monism and/or theory of change, which involve merely one meaning of ἀήρ, namely 'air'. However, ἀήρ has very different functions in both cosmological and cosmogonic contexts. Whereas in cosmogony it is thought of as a *generating* substance, in cosmology as a *carrying* stuff on which the heavenly bodies float. The question is, therefore, whether it has only one or rather two meanings corresponding to its different functions. Since, as we have seen, in Anaximander's cosmogony ἀήρ means 'opaque damp mist', it is quite conceivable that Anaximenes' primordial generating substance called ἀήρ is constituted by damp mist as well. If so, Anaximenes' ἀήρ means both 'air' and 'mist'.²⁸

It may be at once objected that if Anaximenes used ἀήρ in two different meanings, it would be confusing; for it would not be clear what meaning he actually intended in a given context. If, however, the meaning of ἀήρ depended on its function in either cosmogonic or cosmological context, there would not be much room for confusion. Besides, in the contemporary usage, upon which both Anaximander and Anaximenes drew, ἀήρ meant both 'mist' and 'air'.²⁹ So if Anaximenes used ἀήρ in two different meanings, it would not be a peculiarity but rather a continuation or exploitation of the colloquial usage. Both meanings could moreover be clearly distinguished by the use of ἀήρ with some additional adjective that stresses some of its qualities, e. g. its opacity (as in the case of mist).³⁰ His audience would then not have problems to understand what he meant. That Aristotle (or his followers) might have been confused by what Anaximenes said is a different story. As we have seen, Aristotle did not intend to write a historical study; he rather exploited the views of his predecessors (*endoxa*) for the purposes of his own inquiry into the nature of things.

²⁸ As far as I know, no commentator realized that Anaximenes could have used the term ἀήρ in two different ways, and few considered it to mean 'mist'. Burnet (*EGP*, 74) vaguely and ambiguously suggests that '[i]n the earlier cosmogonists "air" is always a form of vapour, and even darkness is a form of "air".' Only Stokes ('Cosmogonies', 23–27) makes a strong case for taking Anaximenes' ἀήρ to mean 'mist'. Yet, since he one-sidedly insisted on the meaning 'mist', his attempt has not been widely accepted. For if in cosmology ἀήρ is conceived of as a carrying stuff on which the earth and the heavenly bodies float (for which we have massive doxographical evidence), it clearly does not mean 'mist'.

²⁹ Louis, 'AHP'.

³⁰ Louis, 'AHP', 69: 'quand il [Homère] veut parler d'un brouillard opaque, il joint à ἀήρ un adjectif tel que πούλός, πολλή, βαθεῖα, ἐρεβεννή.'

Cosmogony and Meteorology versus Theory of Change

Two kinds of ἀήρ are incompatible with the usual interpretation of Anaximenes as a material monist and/or a theorist of change. From the point of view of material monism and theory of change all the uses of ἀήρ are to be reduced to just one fundamental meaning, namely, 'air'. Hence, the assumption of two kinds of ἀήρ in Anaximenes could hold true only if there are strong reasons to question the authenticity of both material monism and theory of change. To begin with, material monism is closely connected with the notion of air as an Aristotelian ἀρχή, which, given the scarcity of our extant fragments, makes any inquiry into material monism independent of Aristotelian point of view very problematic (if possible) at all. We should therefore concentrate on the theory of change, for which there is more evidence. Moreover, if its authenticity were proven, it would, at least indirectly, support the authenticity of material monism as well. For material monism involves a theory of change (all elements being transformations of air). Yet, as D. W. Graham has pointed out, it can be thought of as independent of material monism, whose authenticity he strictly denies.³¹ Be that as it may, the theory of change is implied by a broader range of interpretations, and is thus more representative of Anaximenes' thought than material monism. That is why our scrutiny may be restricted merely to theory of change. Note that Anaximenes' theory is thought to be exemplified by Theophrastus' list of seven gradually transforming elements, namely, fire, air, wind, cloud, water, earth, and stones (Simp. *Phys.* 24, 29 = DK 13 A 5; Hippol. *Ref.* I, 7, 3 = DK 13 A 7; we will deal with the authenticity of this list in the next section of our paper).

If there is any use of a *theory* of elemental transformations, it is to be applicable to, and instantiated by, cosmogony and meteorology that, unlike theory of change, provably constitute an important part of Anaximenes' thought (as well as that of other Presocratics). Theory of change is thus to represent a similar elemental sequence as found in cosmogony and meteorology. In other words, they are to correspond to each other. Yet there are *four* inconsistencies, divergences or discrepancies between theory of change, on the one hand, and cosmogony and meteorology, on the other. That suggests they were not originally a part of a coherent philosophical thought, which further strengthens the suspicion that the theory of change is not authentic and has been imposed upon Anaximenes by the later tradition.

³¹ Graham, *Cosmos*, 41–71.

The first discrepancy bears upon the origin of the earth. According to the theory of change, as implied by Theophrastus' list of elemental transformations, the earth would have been generated from ἀήρ through a series of intermediate stages, i.e. winds, clouds, and water. In cosmogony, however, the earth is thought of as a result of direct condensation or felting of ἀήρ (πιλομένου, Ps.-Plut. *Strom.* 3 = DK 13 A 6). Although Pseudo-Plutarch, whom we owe the only surviving cosmogonic report, is not in general a very reliable source, the reference to felting looks quite archaic, which suggests that there is an authentic core in his report. Thus, the information of direct condensation or felting of ἀήρ into the earth may be trusted as genuine. If so, the sequence of elemental transformations presupposed by the theory of change does not correspond to the cosmogony.

The second discrepancy bears upon the origin of the heavenly bodies. Although, in the extant fragments, there is some confusion about their nature (whether they consist of fire or of earth), by closely looking they seem to be composed of fire alone.³² In keeping with the theory of change one would expect that they have come into existence by the rarefaction of air. For if the earth was formed by the condensation or felting of air, the fiery heavenly bodies should have come to be by its rarefaction. However, it is not the case. According to both Hippolytus and Pseudo-Plutarch the heavenly bodies were not created by ἀήρ (as the theory of change would suggest), but their origin is somehow connected with the earth. Although Pseudo-Plutarch does not specify the exact procedure of their origin (even wrongly suggesting that they might be of earthy nature, Ps.-Plut. *Strom.* 3 = DK 13 A 6), Hippolytus maintains that they were formed by the moisture (ικμάδα) rising from the earth (Hippol. *Ref.* I, 7, 5 = DK 13 A 7). If we take into account that in the doxographical tradition there was a clear tendency to accommodate all accounts about Anaximenes to the theory of change, the suggestion that the heavenly bodies come to be from the earth's moisture seems to contain an authentic core, which might even have some mythological parallels.³³ Perhaps one could object that although the heavenly bodies were not directly formed by ἀήρ (as the theory of change would suggest), their origin nonetheless does not contradict the theory of change. For, as Hippolytus maintains, their fiery nature has come to be by the rarefaction of the earth's

³² Cf. note 27.

³³ Stokes, 'Cosmogonies', 13: 'It is difficult to believe that there is no historical connection between this item and Hesiod's statement that Earth gave birth to starry Heaven.' According to Hölscher there is a parallel between Anaximenes' and Sanchuniathon's cosmogony (U. Hölscher, 'Anaximander und die Anfänge der Philosophie' (hereafter Hölscher, 'Anaximander'), *Hermes* 81 (1953) 257–277; 385–418, at 391–401).

moisture. Therefore, the gradual sequence of transformations of air (presupposed by theory of change) seems to hold with the origin of the heavenly bodies too. As with the formation of the earth, however, the origin of the heavenly bodies from the moisture skips or bypasses air that, according to Theophrastus' list of elemental transformations, is the key intermediate element between fire and damp stuff (like cloud or water), which again confirms a gap between cosmogony and theory of change.

The third discrepancy bears upon the question of whether the earth once formed can undertake a transformation. Theophrastus' list of elemental transformations supports this possibility. But besides the schematic list there is no indication in our extant fragments that the earth could change into something else. Neither is there any mention of the earth's dissolution (either by perishing or by a kind of cyclical cosmogony, e. g. as found in Empedocles), nor do we have any evidence that the earth (or some part of it) could be rarefied into water or ἀήρ. To be sure, as we have just seen, the origin of the heavenly bodies is somehow connected with the earth. But we do not have any reason to suppose that they were formed by the rarefaction of the earth. Whereas according to Pseudo-Plutarch the heavenly bodies are of earthy nature, Hippolytus claims that they came to be from moisture rising from the earth. Perhaps one could object that this moisture came to be by the rarefaction of the earth, but there is no evidence for this objection. First of all, moisture plays no role in theory of change or Simplicius' list of elemental transformations so there is no reason to suppose that it is the product of the rarefaction of the earth. Rather, we can suppose that it represents some kind of residuum of the original ἀήρ. Hence, the cosmogonic formation of the earth that is unique and irreversible is in stark contrast to the reversible nature of theory of change.

The fourth discrepancy bears upon the explanation of meteorological phenomena. Unlike cosmogony, which is unique and irreversible, meteorology describes continuous processes and cycles of some water-related stuff (like vapours, clouds, rains). Although the meteorological phenomena do not cover the whole range of elements implied by Theophrastus' list (excluding earth and stones), they represent a continuous series of gradual transformations of at least some elements, providing a basis for a unified theory of change. Only two reports describing the transformations of meteorological phenomena has survived. According to Hippolytus the 'winds are generated when ἀήρ, having been concentrated (πεπυκνωμένος), is carried along. Being collected and compacted still more clouds are generated and thus turn to water.'³⁴ (Hippol. Ref. I, 7,

³⁴ Translation: D. W. Graham (ed.), *The Texts of Early Greek Philosophy*, I (hereafter Graham, *Texts*), Cambridge: Cambridge University Press 2010, 81.

7 = DK 13 A 7) According to Aëtius ‘clouds are formed when ἄρῃ is thickened (παχυνθέντος) more, and when it is gathered together still more rain is expressed.’³⁵ (Aët. III, 4, 1 = DK 13 A 17).

Because winds and clouds are said to be formed by the process of concentration or thickening, it is clear that ἄρῃ conceived of as thinner means ‘transparent atmospheric air’. As in most testimonies about the Milesians, both reports recur probably to Theophrastus (either to his writing *Φυσικαὶ δόξαι* or to his alleged monograph on Anaximenes). Aëtius’ report omitting wind is probably a slightly distorted version of Theophrastus’ original account. Since the meteorological account corresponds to Theophrastus’ list of transformations (cf. the sequence: air, wind, cloud, water etc.), one can be prone to see the correspondence as its conformation. By the same token, their correspondence may turn out to be suspect. For Theophrastus could have tailored Anaximenes’ meteorological account to the general list of elemental transformations (which he might have seen as his most important achievement) in order to make his thought appear more coherent and unified and, consequently, more philosophical.

Unfortunately, no alternative meteorological account is to be found in Anaximenes’ extant fragments. So we do not have any textual evidence that Theophrastus actually adapted Anaximenes’ meteorology. There are, though, some indirect clues suggesting that he did. According to Theophrastus air performed a key role in Anaximenes’ meteorology, winds, clouds, and rain being thought of as the subsequent stages of its condensation. Given the strong tendency to make Anaximenes’ thought compatible with Aristotelian ἀρχή understood as atmospheric air, it is not surprising. However, air does not seem to play any role in explaining meteorological processes. That is confirmed both by direct observation and by the meteorological views of other Ionian contemporaries of Anaximenes. Unlike other parts of philosophy such as physics, astronomy, metaphysics, or epistemology, meteorological phenomena and processes can be directly observed, which is, by the way, why meteorological views have proven remarkably invariable and stable throughout the antiquity.³⁶ It is the vapours that stand in the centre of the meteorological observations. Vapours rise from the sea or the earth and form clouds from which rain falls; the formation of clouds is accompanied by winds. There is then no room for air in this water cycle.

As to the meteorological views of Anaximenes’ Ionian contemporaries, Xenophanes and Heraclitus did not seem to attribute any significance to air either. Rather, they assume that the origin of meteorological processes is a kind of vapours

³⁵ Translation: Graham, *Texts*, 85.

³⁶ Cf. Kahn, *Anaximander*, 99.

rising from the sea, without ever mentioning air in their explanation. Whereas Xenophanes explicitly says that the sea (πόντος) is the begetter (γενέτωρ) of clouds, winds and rivers (DK 21 B 30), Diogenes Laertius reporting on Heraclitus refers to various vapours (ἀναθυμιάσεις) as the source of seasonal changes, rains and winds (Diog. IX, 10 = DK 22 A 1). According to Hippolytus Anaximander conceived of winds as the finest vapours separated off from ἀήρ (τῶν λεπτοτάτων ἀτμῶν τοῦ ἀέρος ἀποκρινομένων, Hippol. Ref. I, 6, 7 = DK 12 A 11). This account is confirmed by Aëtius reporting that under the influence of the sun ἀήρ is dissolved into two kinds of parts, the fine ones (τῶν λεπτοτάτων) forming wind, the moist ones (ὕγροτάτων) probably precipitation and rain³⁷ (Aët. III, 7, 1 = DK 12 A 24). If so, ἀήρ has to be construed as a kind of vapour or mist, and not as atmospheric air. For if some fine vapours are to be separated off from ἀήρ, it by itself has to represent a denser and damper vapour.³⁸ Not only does the logic of this passage demand it, but this meaning is also confirmed by its use in Anaximander's cosmogony and cosmology (cf. the first section of our paper). So, according to Anaximander, ἀήρ as a thick damp vapour or mist is the source of meteorological phenomena.

To sum up, since Anaximenes' thought might have been heavily distorted by being tailored to Aristotelian ἀρχή conceived of as atmospheric air (and consequently to a theory of change), it is reasonable to suppose that his meteorology could originally have been similar to that of his Ionian contemporaries in general and of Anaximander in particular. Moreover, Anaximenes could have spoken of ἀήρ in his meteorology taking it to mean 'vapour' or 'mist', not 'air' (as is generally assumed). Not only would that be in accord with the observation of a water cycle (evaporations rising from the sea or earth and forming clouds, wind and precipitation), but also with his cosmogony, in which ἀήρ means 'mist' rather than 'air'. Anyway, Anaximenes' meteorology seems to be too problematic or too complex to be seen simply as corresponding to the theory of change.

Plato's *Timaeus* 49b7–c7 and Anaximenes' Theory of Change

So far we have only established the discrepancy between theory of change on the one hand and cosmogony or meteorology on the other and not, strictly

³⁷ Kahn, *Anaximander*, 100: 'Our authorities do not make clear what is left over in the ἀήρ when the finest vapors have been removed. However, this residue would naturally be a thick cloud on its way to precipitation in raindrops or some similar form.'

³⁸ Kahn, *Anaximander*, 101.

speaking, the dubiousness and inauthenticity of the theory of change itself. Still, the discrepancy itself is significant insofar as it forces us to ask how Anaximenes' theory of change is applicable to cosmogony and meteorology or why he conceived of it at all. In any case, though mostly aware of a kind of inconsistency or discrepancy, commentators usually employ two strategies on how to extenuate or skirt round it. Firstly, they simply suppose that Anaximenes did not notice or realize it.³⁹ It is however hardly conceivable that someone who is said to have invented an elaborate and 'brilliant' theory of change would have 'overlooked' its inconsistency with cosmogony. Secondly, being dissatisfied with the first strategy Graham has recently emphasized that theory of change and cosmogony are two distinct processes that have different explanatory usages and do not need to be the same.⁴⁰ Whereas theory of change represents a theoretical or logical sequence of elemental transformations, cosmogony describes the actual formation of the heavenly bodies; in other words, no matter how the earth as the heavenly body was formed, earth as a substance or element comes to be from water (by the process of condensation) or from stones (by rarefaction). The crucial question however remains: What use is a theory of change without any applicability to the actual cosmogonic and meteorological processes?

Of course, if we knew or were sure that Anaximenes really devised a theory of change, Graham's suggestion could hold. The problem is that Anaximenes' theory of change itself looks like an Aristotelian construction. As has been suggested in the first section of our paper, we can suspect that Anaximenes' ἀήρ was construed by, and assimilated with, one of the four Aristotelian elements, i.e. air. If so, Anaximenes' theory of change might have been just a by-product of this assimilation. Since Aristotelian elements can change into one another (they are even characterized by their mutual transformations, Arist. *De gen. et cor.* II,4 331a7–332a2), the assimilation of Anaximenes' ἀήρ with one of the Aristotelian transforming elements would have ultimately imposed upon his thought a theory of gradual change. The process of the assimilation may have been accomplished by Theophrastus, who seems to have exemplified and codified Anaximenes' theory by the list of seven gradually transforming elements preserved in Simplicius and

³⁹ Cf. Guthrie, *History*, 134: 'It is arguable that Anaximenes, having advanced his single brilliant and fruitful hypothesis of condensation and rarefaction, did not pay so much attention to the detailed working-out of a system.' J. Moran, 'The Priority of Earth in the Cosmogony of Anaximenes', *Apeiron* 9 (1975) 17–19, at 17–18: 'In his eagerness to make use of a familiar observation Anaximenes overlooked the fact that his cosmogony was not altogether consistent with the details of his general theory of the transformation of matter in the developed world.'

⁴⁰ Graham, *Cosmos*, 64.

Hippolytus, namely, fire, air, wind, cloud, water, earth, and stones (Simp. *Phys.* 24, 29 = DK 13 A 5; Hippol. *Ref.* I, 7, 3 = DK 13 A 7).⁴¹ Theophrastus might have added some stuff from Anaximenes' meteorology (like winds and clouds) or cosmogony to the Aristotelian schema of four transforming elements, in order to render Anaximenes' thought more unified and compact.

In order to justify the authenticity of Anaximenes' theory of change and its independence of cosmogony and meteorology, Graham suggests taking a passage from Plato's *Timaeus* to be the evidence of Anaximenes' theory. Although it was only Aristotle who mentioned Anaximenes by name (Plato never names him), any pre-Aristotelian reference would be indeed important evidence of his thought. Let us first quote the passage from Plato's *Timaeus*:

First, what we have now called water we observe, as we believe, turning into stones and earth as it is compacted (πηγνύμενον); but then as it dissolves (τηκόμενον) and segregates⁴² (διακρινόμενον), this same thing becoming wind and air (πνεῦμα καὶ ἀέρα); and as it is ignited, air becoming fire; and as it is aggregated⁴³ (συγκριθέν) and quenched in turn, fire departing and turning back into the form of air, and again air, as it comes together (συνιόντα) and is condensed (πυκνούμενον), becoming cloud and mist (νέφος καὶ ὀμίχλην); and from these as they are felted (συμπιλουμένων) still more, coming flowing water; and from water earth and stones again; and these things thus imparting to each other in a cycle, as it appears, their generation.⁴⁴ (*Tim.* 49b7–c7)

The question is, however, to what extent the passage may be seen as representative of Anaximenes' thought. Here, it is not space for a close inquiry into how Plato treated his predecessors, but generally it is to say that he uses their thoughts for his own dialogical purposes (cf. *Phd.* 96a–99d; *Tht.* 151d–186e; *Soph.* 242c–245e). As to the above passage, Plato is interested in outlining a general summary or overview of Presocratic elemental change and not in presenting a single doctrine of a particular predecessor. Hence the dialogical setting of the *Timaeus* seems to exclude the possibility that it is a testimony of Anaximenes, which of course doesn't mean that it may not contain anything

41 Hölscher, 'Anaximander', 274: 'Wahrscheinlicher aber ist, daß das ganze Schema der Verwandlung in zwei Richtungen von Theophrast herrührt, der die von Aristoteles *Phys.* A 4 entdeckten Gegensätze bei Anaximenes etwas konkreter nachweisen wollte.' Similarly J. Kłowski, 'Ist der Aēr des Anaximenes als eine Substanz konzipiert?', *Hermes* 100 (1972) 131–142; G. Wöhrle, *Anaximenes aus Milet. Die Fragmente zu seiner Lehre*, Stuttgart: Franz Steiner 1993, 18–23; 57–58. Cf. also Havelock, 'Linguistic Task', 60: 'A doctrine of "change", itself non-Milesian (...).'

42 As we will immediately see, in keeping with his effort to make the passage compatible with Anaximenes, Graham translates 'disperses'.

43 Graham translates 'compressed' (cf. the previous note).

44 Translation: Graham, *Texts*, 79 (slightly revised).

from Anaximenes. Although Graham realizes that the passage is not genuine (he even admits that its vocabulary is somewhat ‘eclectic’),⁴⁵ he nonetheless presents three reasons why it is a valuable testimony of Anaximenes.⁴⁶

1) Similarly to Theophrastus’ list of seven elements Plato speaks of *seven* elements or stuffs too. It is this list and particularly the *number* of elements that Graham thinks to be one of the most conspicuous features of Anaximenes’ thought and, consequently, the most important evidence for taking the passage to be a testimony of Anaximenes.⁴⁷ 2) Plato’s account describes the reverse elemental transformations as a result of condensation and rarefaction which are the standard processes attributed to Anaximenes. 3) Plato mentions the conception of felting (cf. συμπιλούμενα) which – as we have seen in connection with Anaximenes’ cosmogony – is characteristic of his thought (note that there are other two references to felting in our testimonies, cf. Hippol. Ref. I, 7, 3; I, 7, 6 = DK 13 A 7).

Let us deal with these reasons in more detail. Whereas the term and conception of felting seem to be genuine (third reason), Graham’s first two reasons are rather problematic, if tenable at all. As we have suggested, Graham puts most emphasis on the first reason, i. e. on the number of elements Plato enumerates in the *Timaeus*. The problem is, however, that Plato does not list merely *seven* elements (as Graham counts), but *eight*. Graham is of course very much aware of the fact that Plato enumerates eight elements but dismisses it as a mere ‘anomaly’.⁴⁸ For he is convinced that ‘mist’ (ὀμίχλη) is a mere synonym for cloud (νέφος). To be sure, both terms designate something very similar, the only difference being that the ὀμίχλη is usually not as thick as the νέφος. Moreover, unlike other elements enumerated in the above passage the ὀμίχλη is nowhere in the doxographical tradition counted as an element. So one could be in fact tempted to discard the occurrence of the term ὀμίχλη as a mere anomaly. On the other hand, if Plato’s passage is to be seen as a corroboration of Theophrastus’ list of seven elements in Anaximenes (as Graham insists), the relevance of ὀμίχλη should not be so easily dismissed as it is by Graham.

⁴⁵ D. W. Graham, ‘A Testimony of Anaximenes in Plato’ (hereafter Graham, ‘Testimony’), *The Classical Quarterly* 53 (2003) 327–337, at 330.

⁴⁶ Graham, ‘Testimony’, 328–331.

⁴⁷ Graham, ‘Testimony’, 329: ‘Evidently, Anaximenes’ list of elements is unique and characteristic enough to stamp anyone who uses it (or a significant subset of it) as a follower of Anaximenes.’

⁴⁸ Graham, ‘Testimony’, 328.

Yet, the problem with ὁμίχλη is not the only anomaly in Plato's passage. If we admit that Plato's phrase νέφος καὶ ὁμίχλην does really express synonymity of both terms, then we should explain why not to treat another similar phrase as also expressing synonymity, i. e. the phrase πνεῦμα καὶ ἀέρα. Of course, whether to take both terms as synonyms or not largely depends on how we read the notorious term πνεῦμα, which has lots of different meanings. Since Graham reads Plato's passage as a testimony of Theophrastus' list of Anaximenes' seven elements, he translates the term πνεῦμα as 'wind', taking it as a synonym for ἄνεμος, i. e. the more common term for wind occurring in Theophrastus' list. Yet, the terms πνεῦμα and ἀήρ could be seen as synonyms, meaning 'air'. Although in the context of elemental changes (which Plato's passage evokes) Graham's translation of the term πνεῦμα as 'wind' makes sense, from the point of view of Anaximenes' other testimonies it would be nonetheless better to see it as synonymous with ἀήρ. In the famous fragment that is sometimes considered to be a genuine quotation Anaximenes compares our soul to ἀήρ and further maintains that πνεῦμα and ἀήρ encompass the whole world (ὅλον τὸν κόσμον πνεῦμα καὶ ἀήρ περιέχει), to which Aetius, preserving the fragment, immediately adds his comment that Anaximenes employs both terms synonymously (συνωνύμως, Aët. I, 3, 4 = DK 13 B 2). Though probably not genuine,⁴⁹ the fragment suggests that Anaximenes or at least the later tradition conceived of both terms as synonyms. Accordingly, Plato's passage might provide an important testimony of Anaximenes; however, not of his alleged theory of elemental change but (as we will suggest in the last section of our paper) rather of his terminology. In any case, Plato's passage does not justify us in seeing it as a corroboration of Theophrastus' list of Anaximenes' seven elements. Strictly speaking, Plato mentions *eight* elements. If we argued (as Graham did) that νέφος and ὁμίχλη are synonyms, we could similarly argue that πνεῦμα and ἀήρ are synonyms too. There is I think even better textual evidence for taking πνεῦμα and ἀήρ to be synonyms than it is for the terms νέφος and ὁμίχλη. If so, Plato would speak only of six elements. Hence, depending on how we approach the passage, we can find six, seven, or eight elements.

The second reason of why Graham sees Plato's passage as a testimony of Anaximenes is that it describes the reverse elemental transformations as a result of the processes of condensation and rarefaction, which are usually attributed to Anaximenes. Leaving aside that both processes might have been imposed upon Anaximenes' thought by later tradition, it should be noted that apart from the neutral verb 'become' the transformations of the elements are described not only in (monistic) terms of condensation and rarefaction but also in rather

49 Cf. Alt, 'Satz des Anaximenes'.

contradictory terms of segregating (διακρίνειν), aggregating (συγκρίνειν) and coming together (συνιέναι), which are usually combined with the pluralistic conception of the elements' admixture. Now, given the lack of Anaximenes' genuine terminology it could be the case that he had not yet distinguished which was later, especially by Aristotle, described as qualitative change, on the one hand, and mixing and dissolving, on the other. By the same token, one might suspect that it was Plato who intentionally conflated and confused the terminology of the various Presocratics in order to make an impression that the passage from the *Timaeus* is a general account of how the Presocratics described and explained elemental transformations. In addition, there is a fragment of Anaxagoras that is strikingly similar to Plato's passage. It reads:

From these things being separated (ἀποκρινόμενων) earth is compacted (συμπήγνυται). For from clouds water is separated (ἀποκρίνεται), from water earth, and from earth stones are compacted (συμπήγνυνται) by the cold. These stones move out more than water.⁵⁰ (DK 59 B 16)

Like Plato in the *Timaeus* Anaxagoras seems to conflate or confuse the terminology for describing condensation and rarefaction (cf. the term συμπήγνυσθαι 'to be compacted') with that of mixing together and dissolving (cf. the term ἀποκρίνεσθαι 'to be separated'). Graham is of course very much aware of the similarity between both passages. In keeping with his conviction that Anaximenes' theory of change is genuine, he suggests taking Anaxagoras' fragment to be an imitation of Anaximenes' thought.⁵¹ Accordingly, Graham can assume that both Plato and Anaxagoras drew on Anaximenes. However, if we once more realize that there is no direct or authentic textual evidence for Anaximenes, we can, by the same token, argue that Plato in the passage from the *Timaeus* drew primarily on Anaxagoras, conflating his terminology with that of other Presocratics including Anaximenes (cf. the mention of felting).

Be that as it may, it is not probable that the passage from the *Timaeus* is derived from, or dependant on, Anaximenes. Plato seems to have either conflated and confused Presocratic terminology in order to create a general account of Presocratic elemental transformations or just paraphrased a piece of Anaxagoras' thought. If so, Graham's attempt to see Plato's account as a corroboration of Anaximenes' theory of change fails.

⁵⁰ Translation: Graham, *Texts*, 295.

⁵¹ D. W. Graham, 'A New Look at Anaximenes', *History of Philosophy Quarterly* 20 (2003) 1–20, at 8: 'Evidently Anaxagoras thought Anaximenes' theory of change was especially apt in the field of cosmogony.'

Conclusion: Anaximenes' Cosmological System

Scrutiny of Anaximenes' extant fragments has revealed that a kind of damp dark mist, moisture or vapour played a key role in his thought. In Pseudo-Plutarch's cosmogonic report of the origin of the earth the term ἀήρ occurs meaning 'damp dark mist' (Ps.-Plut. *Strom.* 3 = DK 13 A 6). In his cosmogonic account of the origin of the heavenly bodies Hippolytus speaks of 'moisture' (ἱκμάδα) rising from the earth and forming the heavenly bodies (Hippol. *Ref.* I, 7, 5 = DK 13 A 7). As to Anaximenes' meteorology, no reliable information has survived (the only two surviving meteorological reports seem to be distorted). As the meteorological accounts of other Ionians, in particular that of Anaximander, suggest, Anaximenes may have conceived of some kind of vapours rising from the sea or the earth as a source of the meteorological phenomena, air playing no role in their explanation.

Since only indirect fragments have survived, we cannot be sure what Greek terms Anaximenes employed for designating damp dark mist, moisture or vapours, nor whether he used only one or more terms. However, as D. W. Graham has pointed out, the Ionians explained the astronomy by means of meteorology; he even speaks of the Meteorological Model of their astronomy or cosmology.⁵² So if they saw parallels and similarities between astronomical and meteorological phenomena, Anaximenes might have conceived of only one misty or vaporious substance that accounts for different kinds of phenomena (i. e. the cosmogonic origin of the earth, the cosmogonic origin of the heavenly bodies, and the meteorological processes). In addition, it is probable that he used the term ἀήρ to designate it.

Anaximenes, however, did not employ the term ἀήρ only in the meaning 'mist' but in keeping with the contemporary usage he exploited both its meanings: 'mist' and 'air'. At first sight, that could be seen as confusing. Yet, he seems to have clearly distinguished between both meanings. Not only could he have stressed their difference by the use of some specifying adjectives, but, most importantly, he distinguished them functionally. Whereas he conceives of mist or vapour as a *generating* or *transforming* substance, air functions only as a *carrying* stuff on which the earth and the heavenly bodies float. As we will immediately see, air is probably only a product of a transformation of the primordial mist and as such cannot undergo any further changes or transformations. To reiterate, the double use of ἀήρ accords with the contemporary usage. Besides, that can also explain later distortions of Anaximenes' thought. Since in

⁵² Graham, *Science before Socrates*, 78–84.

the later tradition ἀήρ came to mean primarily ‘air’, it might easily have been confused with, and mistaken for, the original predominant meaning ‘mist, vapour’.

There are two other hints that Anaximenes might have distinguished two kinds of ἀήρ meaning air and mist: 1) In describing the elemental transformation Plato in the *Timaeus* uses the phrase πνεῦμα καὶ ἀέρα (cf. *Tim.* 49b7–c7). If the passage has something to do with Anaximenes (as the term συμπιλουμένων may suggest), the phrase could be somehow connected with Anaximenes’ thought; note that Aëtius too in a fragment that even Diels considered to be genuine (Aët. I, 3, 4 = DK 13 B 2) attributed to Anaximenes the same phrase. Although the phrase itself suggests that Anaximenes might have distinguished two kinds of ἀήρ, it is not clear whether it contains the authentic wording or whether it is only a later interpretation, the term πνεῦμα being an additional insertion. 2) Aristotle may have played a crucial role in ascribing air (ἀήρ) as the only fundamental (ontological and cosmogonic) principle (ἀρχή) to Anaximenes (*Met.* 984a5–7); nevertheless, Aristotle’s treatise on *Meteorology* suggests that a notion of two kinds of ἀήρ or vapours was not exceptional in contemporary philosophical or theoretical thought (note however that despite some structural similarities the function of their distinctions is different). Aristotle distinguishes two kinds of exhalations (ἀναθυμιάσις), the one more vaporous (ἀτμιδωδεστέρα) and the other more windy (πνευματωδεστέρα). Both exhalations arise from the earth but occupy different regions of the atmosphere: whereas the windy exhalations that are hot rise up to the boundary of the celestial or heavenly sphere consisting of the fifth element, the more vaporous ones that are more watery and heavy remain closer to the earth, i. e. in the region of the atmosphere where the clouds are formed (Arist. *Meteor.* 341b6–24).⁵³

Let us sum up the role and function of both meanings of ἀήρ in Anaximenes’ thought. Before the cosmogonic process started, there had been only damp dark mist. The earth was formed by its condensation or felting (Ps.-Plut. *Strom.* 3 = DK 13 A 6). Since the earth floats on air (Arist. *De caelo* 294b13–21 = DK 13 A 20; Ps.-Plut. *Plac.* 3 = DK 13 A 6; Hippol. *Ref.* I, 7, 4 = DK 13 A 7), it is probable that air came to be simultaneously with the formation of the earth, perhaps constituting a residual product of its formation. Hence, the primordial mist seems to have been transformed both into the earth and air. Since the heavenly bodies were formed by a moisture rising from the earth (Hippol. *Ref.* I, 7, 5 = DK 13 A 7), we can speculate that some primordial mist remained in/on the earth (in valleys or cavities). Some amount of it, which first rose up to the sky, formed the heavenly

⁵³ For this reference to Aristotle’s *Meteorology* I owe the anonymous referee.

bodies. The rest became the source of water and meteorological phenomena. Perhaps the newly formed sun played an important role in these processes.

To conclude, Anaximenes does not seem to have *theorized* about the mechanism of change (as is usually assumed) but was rather interested in explaining the natural phenomena by setting up a *model* of how the world came to be and how it functions (as his predecessor and mentor, Anaximander, seems to have done as well, cf. his cosmogonic and cosmological system). In other words, rather than seeing the hallmark of Anaximenes' philosophy in his alleged theory of change, we should rather appreciate his explanations of cosmogonic and cosmological phenomena, e. g. the formation of the earth by means of felting; the idea that the earth floats on air, which played an important role in the subsequent Presocratic cosmology (e. g. in Anaxagoras or Democritus); the origin of the heavenly bodies as a moisture rising from the earth and their nature as fiery leaves carried by winds.

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