Aristotle's 'So-Called Elements'

Abstract

Aristotle's use of the phrase τὰ καλούμενα στοιχεῖα is usually taken as evidence that he does not really think that the things to which this phrase refers, namely, fire, air, water, and earth, are genuine elements. In this paper I argue that there are no linguistic or textual grounds for taking the phrase τὰ καλούμενα στοιχεῖα in this way. I offer a detailed examination of the significance of the phrase, and in particular I compare Aristotle's general use of the Greek participle καλούμενος (-η, -ον) in other contexts. I conclude that his use of the phrase τὰ καλούμενα στοιχεῖα does not carry ironical or sceptical connotations, and that it ought to be understood as a neutral report of a contemporary opinion that the elements of bodies are fire, air, water, and earth. I leave aside the question as to whether or not Aristotle himself endorses this opinion.

Key words: Aristotle, elements, so-called elements, prime matter

Aristotle's 'So-Called Elements'

Aristotle sometimes uses the phrase τὰ καλούμενα στοιχεῖα. This phrase, and the similar phrase τὰ λεγόμενα στοιχεῖα, can be translated as 'what are called elements', or, more commonly, 'the so-called elements'. The most common explanation of Aristotle's use of this phrase is that it implies his rejection of, or at least his scepticism towards, the claims to elemental status of the things to which he refers in this way. These things are usually taken to be the Empedoclean elements, fire, air, water, and earth. They are merely 'so-called' elements, that is, 'so-called' in the sense of 'incorrectly called'. In other words, Aristotle uses τὰ καλούμενα στοιχεῖα with reference to fire, air, water, and earth because he doesn't think that these things are the genuine elements of bodies.[1]

I would like to express my gratitude to the Royal Institute of Philosophy, whose assistance in the form of a Jacobsen Fellowship allowed me the opportunity to pursue this research. I would like also to acknowledge the input of Edward Hussey, Ben Morison, and Malcolm Schofield, who each read the penultimate draft and pointed out many ways, both methodological and stylistic, in which it could be improved. My greatest debt, however, is to Michael Frede, who read and commented upon a number of earlier drafts, and with whom I had the privilege of working closely on Aristotle for over half a decade.

[1] Explicit statements of this view can be found in J. Burnet *Early Greek Philosophy*, 4th edn (London, 1930), p. 230, n. 3; H. Diels *Elementum* (Leipzig, 1899), p. 25; H. Joachim *Aristotle On Coming-to-be and Passing-away A Revised Text with Introduction and Commentary* (Oxford, 1926), p. 137; D. Ross *Aristotle's Physics*: *A Revised Text with Introduction and Commentary* (Oxford, 1936), p. 484; Düring *Aristotle's De Partibus Animalium* (Göteberg, 1943), p. 124; C.H. Kahn, *Anaximander and the Origins of Greek Cosmology* (New York, 1960), p. 120; R. Sokolowski 'Matter, Elements, and Substance in Aristotle', *Journal of the History of Philosophy* 8 (1970), 263-88, pp. 268-9; C.J.F. Williams *Aristotle's De Generatione et Corruptione* (Oxford, 1982), p. 152; D.W. Graham 'The Paradox of Prime Matter', *Journal for the History of Philosophy* 25 (1987), 475-90, p. 476, n. 5; M. Crubellier, '*Metaphysics* Λ 4', in M. Frede and D. Charles, (eds) *Aristotle's* Metaphysics *Lambda* (Oxford, 2000), 137-60, p. 142; and M. Rashed *Aristote De la Génération at la Corruption: Texte et Traduction* (Paris, 2005), 129, 152-3.

To appreciate the reasoning behind this interpretation we need briefly to note Aristotle's definition of an element. For Aristotle an element of something is the most basic constituent of that thing. It is indivisible into things that are different in form, which is to say that it cannot be analysed into further constituents—or 'elements'—of its own. The elements of *bodies*, then, are the simplest constituents of bodies (*Metaph.* V.3, 1014a26-34, *De caelo* III.3, 302a14-21). Now the fundamental premiss behind the most common explanation of τὰ καλούμενα στοιχεῖα is precisely that Aristotle analyses fire, air, water, and earth into more fundamental constituents. Consequently the latter—often believed to be the primary 'qualities', the contraries hot and cold, dry and wet, and often also 'prime matter'—are more deserving of the name στοιχεῖα, or 'elements'. These items—the contraries alone, or together with prime matter—are considered the true elements of bodies because together they compose fire, air, water, and earth.[2] So, to sum up, on the most common explanation of Aristotle's use of the phrase τὰ καλούμενα στοιχεῖα, by using this phrase Aristotle signals that, in his view, fire, air, water, and earth are not elements strictly speaking, because they reveal under analysis further, more fundamental, that is, more *elemental*, items.

In this paper I argue that there are no linguistic grounds for taking the phrase τὰ καλούμενα στοιχεῖα to carry the sceptical connotations so often attributed to it in the secondary literature. I conclude that Aristotle's use of the phrase ought to be understood as a neutral report of a contemporary, popular opinion that the elements of bodies are fire, air, water, and earth. Whether or not Aristotle himself endorses this

[2] See, for example, Joachim, *Aristotle On Coming-to-be* , pp. 137, 191, 200; F. Solmsen *Aristotle's System of the Physical World* (Ithaca, 1960), pp. 351, 368; H.R. King 'Aristotle without *Prima Materia*', *Journal for the History of Ideas* XVII (1956), 370-89, p. 376ff.; M. Furth *Substance, Form and Psyche: An Aristotelean Metaphysics* (Cambridge, 1988), pp. 76-79, 221-227; M.L. Gill *Aristotle on Substance* (Princeton, 1989), pp. 67-82; E. Lewis *Alexander of Aphrodisias On Aristotle's Meteorology 4*, (Ithaca, 1996), pp. 15-22, 34-59.

opinion is a question that I shall leave aside. I believe that he does, albeit not without certain qualifications; but to establish this would require an investigation of the precise nature of the relationship between the 'so-called elements' and the contrary 'qualities'—a task not to be undertaken lightly. My aim here is duly limited to the task of removing the phrase τὰ καλούμενα στοιχεῖα from among the exhibits of evidence that Aristotle withholds genuine elemental status from fire, air, water, and earth.

1. Elements and 'So-called Elements'

Let's begin by getting clear about the things to which Aristotle intends to refer when he uses the phrase τὰ καλούμενα στοιχεῖα. Now, in physical or metaphysical contexts,[3] an 'element', strictly speaking, is the primary material constituent into which bodies divide, or into which bodies can be analysed (*Metaph.* V.3, 1014a31-34; *De caelo* III.3, 302a14-19; cf. *Metaph.* III.3, 998a22-b4; cf. *Metaph.* VII.17, 1041b31: στοιχεῖον δ' ἐστὶν εἰς ὃ διαιρεῖται ἐνυπάρχον ὡς ὕλην). Aristotle is well aware, however, that some of his contemporaries call quite different things 'elements'. For instance, the most universal things, in particular the general kinds or categories to which things belong, or the 'genera', are also called 'elements' by some people (στοιχεῖα τὰ γένη λέγουσί τινες, *Metaph.* V.3, 1014b10-11; with 1014b3-7).[4] Nevertheless it is quite clear from the contexts in which the phrase τὰ καλούμενα στοιχεῖα appears that what we are talking

[3] As opposed to the 'alphabetic' or 'geometric' contexts; see T. Crowley, 'On the Use of *Stoicheion* in the Sense of 'Element'', in *Oxford Studies in Ancient Philosophy* 29 (2005), 367-94, p. 370f.

[4] Aristotle has Plato, or Platonists, and Pythagoreans in mind. See Ross *Aristotle's Metaphysics*: *A Revised Text with Introduction and Commentary*, 2 Vols. (Oxford,1924), I, p. 295.; and A. Madigan *Aristotle Metaphysics Book B and Book K 1-2* (Oxford, 1999), pp. 24, 68. Cf. *Metaphysics* I.5, 986a1; I.7, 987b18-21, 988a11; III. 3, 998b9-11; VII.2, 1028b25-8; XII.1, 1069a26-28. For evidence that the Platonists call their principles στοιχεῖα see *Metaphysics* XIV.1, 1087b9-10, b12-13; cf. XIII.6, 1080b6-7, XIII.7, 1081b32, XIV.3, 1091a9-10.

about are material principles. In the *Parts of Animals*, for instance, Aristotle refers to τὰ καλούμενα ὑπό τινων στοιχεῖα, and immediately gives as examples earth, air, water, and fire (II.1, 646a13). Likewise in *Metaphysics* Kappa, the same expression refers to the principles that are present as constituents (ἐνυπάρχοντα) in composite things, and these are contrasted with universals (XI.1, 1059b23f.).[5]

So by τὰ καλούμενα στοιχεῖα Aristotle is referring to material, or corporeal, as opposed to incorporeal, principles. Is it possible to be more specific? The usual assumption, particularly among those who believe that the phrase signals Aristotle's dissatisfaction or scepticism, is that the 'so-called elements' are the 'Empedoclean' quartet, that is, fire, air, water, and earth.[6] This assumption would appear to have support in passages like that cited from the *Parts of Animals* above. Moreover, although Aristotle sometimes refers to other kinds of corporeal principles as στοιχεῖα, for instance, those of Anaxagoras and the Atomists, he never refers to them as τὰ καλούμενα στοιχεῖα.[7] But it would be an error to identify the 'so-called elements' as *Empedocles's* elements. Consider, for instance, the use of τὰ καλούμενα στοιχεῖα at *Physics* I.4. Aristotle says that Empedocles separates out 'only the so-called elements' (187a20-26). Clearly he doesn't mean to say that Empedocles posits only the things that *Empedocles* (or his followers) calls 'elements'. It seems rather that there must be a distinction between the elements posited by Empedocles, and the 'so-called elements'.

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[5] For doubts about the authenticity of *Metaphysics* Kappa, see Ross *Aristotle's Metaphysics*: *A Revised Text with Introduction and Commentary*, 2 Vols. (Oxford,1924), I, p. xxv-xxvii).

[6] See, for example, Philoponus *In Aristotelis physicorum libros octo commentaria*, 16. 94.13-15, Ross *Aristotle's Physics*, p. 484.

[7] For Anaxagoras, see *De caelo* III.3, 302a31, III.4, 302b13, cf. *Metaph.* I.8, 989a31f; for Democritus and Leucippus, see *De Gen. et Cor*. I.1, 314a18-20, *Physics* III.4, 203a20, *De anima* I.2, 404a4-5, cf. *Metaph.* I.4, 985b5.

Further evidence that this is so appears to be available at *De Gen. et Cor.* I.6, where Aristotle raises the question whether the so-called elements are eternal (ἀίδιον), or whether they come to be in some way (322b1-3). He is asking, in other words, whether the so-called elements are *as Empedocles conceives of them*, that is, eternal, or not. Indeed the very fact that Aristotle names Empedocles as *the first* to posit these four elements is in itself highly significant (*Metaph.* I.4, 985a32). For it would be worth pointing this out only if it is relatively common for fire, air, water, and earth to be identified as the elements. It appears, then, that fire, air, water, and earth are well known, not, or not necessarily, as *Empedocles*' elements, but as the things that are commonly thought to be elements.[8]

So much for what the phrase τὰ καλούμενα στοιχεῖα refers to. Before turning to consider the reasons *why* Aristotle uses this phrase, there is an important point to make about the *frequency* of his use. Kahn expresses a fairly widespread opinion when he notes that Aristotle 'normally refers to these [fire, air, water, and earth] as the 'so-called elements".[9] But this is quite an exaggeration. As a matter of fact, Aristotle only occasionally prefaces the term στοιχεῖα with the qualification 'so-called' (whether καλούμενα or λεγόμενα). We find the phrase τὰ καλούμενα στοιχεῖα only ten occasions in the entire corpus—the variant τὰ λεγόμενα στοιχεῖα appears just three times. More

[8] Cf. Plato's *Timaeus,* in the remark that we tend unreflectively to say that fire, air, water, and earth are the *archai* and *stoicheia* of everything (48b-c). I discuss the significance of this passage for the usage of στοιχεῖον in Crowley, 'On the Use of *Stoicheion'*, p. 378f.

[9] *Anaximander*, pp. 120 and 124. Ross *Aristotle's Metaphysics* I, p. 294, says that Aristotle does so 'frequently' (cf. Crubellier '*Metaphysics* Λ 4', p. 142, D. Graham *Explaining the Cosmos: The Ionian Tradition of Scientific Philosophy* (Princeton, 2006) p. 39); others give the impression that he does so all the time; cf. Burnet *Early Greek Philosophy*, p. 230, n. 3, and J. Longrigg *Greek Rational Medicine: Philosophy and Medicine from Alcmaeon to the Alexandrians* (London, 1993), p. 151.

often, if he does not call them 'primary bodies' or 'simple bodies', Aristotle refers to fire, air, water, and earth simply as τὰ στοιχεῖα, or τὰ στοιχεῖα τῶν σωμάτων (*GA* I.1, 715a11, *De Gen. et Cor.* II.1, 328b31; cf. *Meteor* I.3, 339b5). The phrase τὰ καλούμενα στοιχεῖα is notably absent is the *De caelo*. In this work, Aristotle identifies fire, air, water and earth as the simple and primary bodies, and unhesitatingly refers to these four as στοιχεῖα from almost the beginning of the treatise (for example, I.3, 270a33; I.8, 276b9, 277b14, III.1, 298b10). So it is certainly not the case that Aristotle normally refers to fire, air, water, and earth as the 'so-called elements'.

2. The Sceptical Reading

We now have a good idea about what Aristotle is referring to by the phrase τὰ καλούμενα στοιχεῖα. Next we must try to grasp the significance of Aristotle's use of this phrase. Why does he qualify these items as *so-called* elements?

According to the most common explanation, Aristotle's use of the phrase τὰ καλούμενα στοιχεῖα reveals his ironical or sceptical attitude towards the elemental status of fire, air, water, and earth.[10] I shall refer to this interpretation as 'the sceptical reading'. On the sceptical reading, Aristotle uses the phrase τὰ καλούμενα στοιχεῖα in order to distinguish those items that are incorrectly called στοιχεῖα from those that he believes to be the true elements of bodies. The former are the 'Empedoclean', or traditional, elements fire, air, water, and earth. They are not truly elemental because they are composite bodies; that is to say, they can be analysed into more basic constituents. Hence although they are evidently called 'elements', their constituents are the true elements. But what are the constituents of fire, air, water, and earth? Kahn, in his study of elements and opposites in Ancient Greek philosophy, offers the following explanation:

[10] For references, see note 1 above.

> When [Aristotle] speaks of 'the so-called elements', he has in mind the classic tetrad of earth, water, air, and fire. Since these are for him not the true elements, he uses the word with some reserve: τὰ καλούμενα (or λεγόμενα) στοιχεῖα. What Aristotle properly designates as an 'element' is the primary, simple ingredient of a composite thing (*Met.* 1014a26ff.). In his view, the true elements of the natural world are not these concrete bodies of earth, water and the rest, but the four chief physical opposites: Hot and Cold, Dry and Wet. It is from the combination of these opposing principles that the four elemental bodies arise.[11]

This itself needs some explanation. Aristotle introduces what he calls the 'principles of tangible body', or the 'primary differentiae', at the beginning of *De Gen. et Cor.* II.2 (329b7-11, b16-18). The differentiae are the contraries hot and cold, dry and wet, and one from each pair of contraries is allotted to each element. The precise relationship between the elements and the contraries is a disputed issue: on the interpretation offered by Kahn, which is representative of the sceptical reading, the relationship is one of constituents to that which is constituted. Fire, for instance, is constituted by hot and dry, water by cold and wet; air by hot and wet, earth by cold and dry. But, according to the definitions in *Metaphysics* Delta and the *De Caelo*, an element is a basic or ultimate constituent of things, unanalysable into things different in form. It follows, firstly, that fire, air, water, and earth must be excluded from the status of elements;[12] and secondly,

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[11] Kahn *Anaximander*, p. 120; see also p. 124, and in general chapter 2.

[12] Kahn *Anaximander*, p. 124, on the definition at Delta 3 and *De Caelo* III.3, writes: '[it is] so rigorous that the four primary bodies are not true elements for Aristotle, who [therefore]… normally refers to them as the 'so-called elements'.' For Ross *Aristotle*, 5th edn (London, 1949) fire, air, water, and earth are 'not

that their constituents, the contraries hot and cold, dry and wet, are more deserving of the name στοιχεῖα.[13] Indeed, it is often thought that Aristotle actually calls the contraries στοιχεῖα in Book II of the *De Gen. et Cor.*[14]

The thesis of the sceptical reading, then, is that Aristotle uses the phrase τὰ καλούμενα στοιχεῖα because he thinks that fire, air, water, and earth can be analysed into constituents, and therefore they are not truly elemental. A plausible reason for the popularity of this reading is that its basic premiss fits very well with the traditional interpretation of Aristotle's account of generation and corruption. For the traditional interpretation is clearly disposed towards denying to fire, air, water, and earth the status of genuine elements. After all, its central claim is that fire, air, water, and earth come to be through the action of the contraries hot and cold, dry and wet upon prime matter. Clearly the former are thus conceived as composite, rather than simple, bodies: composites of form—the contraries—and matter—prime matter. The interpretation of the contraries as constituents of fire, air, water, and earth is explicitly linked to the traditional doctrine of prime matter by Joachim, Ross, Cherniss, and Solmsen, to name but a few.[15] But the sceptical reading is certainly not exclusive to those who subscribe to

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strictly elements since they are logically analysable', p. 105.

[13] Kahn *Anaximander*, p. 126.

[14] See for example, Philoponus *In de gen et corr* 14.2, 224.1-5, Joachim *Aristotle On Coming-to-be*, p. 213; Ross *Aristotle's Physics*, p. 484; Kahn *Anaximander*, p. 120f.; A.R. Lacey 'The Eleatics and Aristotle on Some Problems of Change', *Journal of the History of Ideas*, 26 (1965), 451-68, p. 464; Sokolowski 'Matter, Elements, and Substance', pp. 269-71; Williams *Aristotle's De Generatione et Corruptione*, p. 160; Furth *Substance, Form and Psyche*, p. 223; cf. D. Frede '*On Generation and Corrupti*on I 10: On Mixture and Mixables', in De Haas, Frans and Jaap Mansfeld (2004), (eds), *Aristotle's* On Generation and Corruption I *Symposium Aristotelicum* (Oxford, 2004), 289-326, p. 303.

[15] Joachim *Aristotle On Coming-to-be*, p. 137; see also pp. 104, 193, 200; Ross *Aristotle's Physics*, p. 484, and cf. (1949), 73, 168-9; Cherniss *Aristotle's Criticism of Presocratic Philosophy* (Baltimore, 1935), pp. 54, 60-1,

the traditional doctrine. Many commentators have adopted the view that the contraries are Aristotle's true elements, while remaining silent about, or indeed sometimes explicitly eschewing, the tradition's notion of prime matter.[16] So this view of the contraries may be called the prevailing opinion not only among those who subscribe to prime matter, but also those who may be less willing to accept the traditional interpretation.[17]

But is the sceptical reading acceptable? Does the phrase τὰ καλούμενα στοιχεῖα really indicate a sceptical attitude towards the things described in this way? Indeed, does καλούμενος as Aristotle uses it *ever* indicate scepticism?

3. Three Possibilities for the Use of καλούμενος

In the next section, I examine Aristotle's usage of the phrase τὰ καλούμενα *x*, where *x* are things other than στοιχεῖα, in order to show that his usage offers neither precedent nor support for understanding the phrase τὰ καλούμενα στοιχεῖα according to the sceptical reading. Consequently I suggest that the sceptical reading be abandoned.

But in order to give some shape to the following review of texts, I here propose the following threefold classification of possible uses of καλούμενος: (a) neutral, (b)

122; and *Aristotle's Criticism of Plato and the Academy* pp. 160, 171; Solmsen 'Aristotle and Prime Matter: A Reply to Hugh R. King', *Journal for the History of Ideas*, XIX (1958), 243-52, pp. 245, 249, and *Aristotle's System*, p. 351. See also Sokolowski 'Matter, Elements, and Substance', pp. 268-9.

[16] Furth *Substance, Form and Psyche* attacks the traditional theory of prime matter, while arguing that the contraries are more fundamental than the elements. He also insists that Aristotle is being most 'consistent' when he refers to fire, air, water, and earth as the 'so-called elements', pp. 77, 223.

[17] Kahn makes no reference to prime matter in his discussion of elements and opposites. Similarly, R.J. Hankinson, *Cause and Explanation in Ancient Greek Thought* (Oxford, 1998) takes the view that the contraries are primary and compose the elements (180), without offering an opinion about prime matter (see p. 116, n. 49).

sceptical, and (c) technical or 'novel'. I am taking as a model for this classification the uses distinguished by the OED of the English participial adjective 'so-called'. Thus the 'neutral' and 'sceptical' uses are more or less analogous to the the predicative and attributive uses of 'so-called' respectively, while the 'technical' use corresponds to a non-sceptical attributive use.[18] But let me explain how I conceive of these.

There are instances of Aristotle's use of καλούμενος that clearly do not imply impropriety of use; for want of a better term, let's call this (a) the neutral use. I have in mind in particular those instances where the term qualified is a familiar one, in common or general use. On the other hand there are, allegedly, instances that do imply impropriety of the use of the term so qualified: this is (b) the sceptical use. So both (a) and (b) imply that what is described as 'ὁ καλούμενος *x*' is something that is, as a matter of fact, usually or regularly called *x*. But sense (b) moreover implies or involves a claim that the name '*x*' is being applied incorrectly, or at least a suggestion of doubt or scepticism as to whether the thing in question ought to be called *x*. Use (a), on the other hand, is, as its name suggests, neutral as to the propriety of the name of the thing so described. That is to say, when Aristotle uses καλούμενος in this way, he is drawing attention to the term for reasons other than to suggest misuse. It is best to leave the description of this use quite general, because there are any number of reasons why Aristotle might be drawing attention to a term. Identifying an instance of the use of καλούμενος as an instance of use (b) is thus only the initial step towards making sense of Aristotle's intentions: one must still ask why Aristotle is using καλούμενος in the particular context.

Finally I identify a third use, that I call (c) the technical or 'novel' use. The 'technical' use differs from both (a) and (b) in that the term qualified is not in common

[18] See OED, s.v., 'so-called'.

or general use, but is unfamiliar, either because it is drawn from some specialised discourse, or is a new coinage, or else because it is a term familiar in one sense that is being employed in an unfamiliar sense. The qualification thus flags the novelty of the usage. Of course, whether a term is deemed novel or familiar, common or uncommon is relative to one's audience or linguistic community. A term may be in common use within a particular linguistic community, yet unfamiliar beyond that community. The community may use unfamiliar or specialised terms because they are the experts in a certain discourse; in some cases, a term may be considered unfamiliar because it is only used by the population of a certain geographic area, in which case we are talking really about a 'local' rather than 'technical' usage. The distinction is perhaps not watertight; on occasion a technical sense and a local sense may coincide, if it concerns the name of a thing found only or mainly in a particular area. But as a provisional classification this much will suffice.

Thus we have distinguished three possible uses of the participial adjective καλούμενος: (a) the 'neutral' use, (b) the 'sceptical' use, and (c) the 'technical' (or 'novel') use. The question now is whether or not the Greek participle καλούμενος has each of these three uses; in particular, we need to consider the plausibility of καλούμενος having a sceptical use. This is a question that cannot be decided by looking at the use of καλούμενος in the phrase τὰ καλούμενα στοιχεῖα; rather the problem must be resolved by examining Aristotle's general use of καλούμενος as a qualification upon terms. If we find, and I argue that we shall, that καλούμενος is used by Aristotle without any hint of scepticism or doubt, then it follows that it is unlikely that the phrase

τὰ καλούμενα στοιχεῖα implies a scepticism towards the claims of the things that are described in this way to be genuine elements.[19]

But before embarking on this examination, it is necessary to admit that there is what may appear to be very good evidence that the Greek participle καλούμενος does indeed have the sense attributed to it by the sceptical reading. In his commentary on the *Physics*, Philoponus takes τὰ καλούμενα στοιχεῖα to be an indication of Aristotle's doubts about fire, air, water, and earth. Philoponus says that Empedocles' four elements are qualified by Aristotle as 'so-called' elements precisely because they are not really elements; and this is because they are composite, rather than simple, bodies (*In phys.* 16. 94.13-15).[20] Philoponus thus sets a precedent for the sceptical reading. But, anticipating the results of the forthcoming discussion, I would suggest that this is less a comment on a typical usage of the adjective καλούμενος than an interpretative decision on Philoponus' part to take τὰ καλούμενα στοιχεῖα in this way. Philoponus believes fire, air, water, and earth are composite bodies, and therefore he infers that the phrase τὰ καλούμενα στοιχεῖα must be a way of indicating that they are not strictly speaking (κύριῶς) the elements. The question, however, is whether Aristotle himself would have used καλούμενος in this way, that is, whether he uses it to express a sceptical attitude towards the things so described. And we can only get clear about this by considering Aristotle's own usage of the term.

4 Aristotle's Use of καλούμενος

Aristotle uses the phrase 'τὰ καλούμενα *x*' (and related forms, ὁ καλούμενος, ἡ

[19] In what follows I consider only the use of καλούμενος. I am confident that a review of λεγόμενος would have similar results.

[20] See also Philoponus, *In de gen et cor* 14.2. 205.23-5; cf. 14.2. 206.24-26.

καλουμένη, τὸ καλούμενον *x*) very often in his works. What we find in the texts where Aristotle uses the phrase is that it corresponds to either (a) the 'neutral' or (c) the 'technical' uses: what we do not find is a use of the phrase that corresponds to (b) the 'sceptical' use.

Most instances of καλούμενος evince the 'neutral' use. But often it can be difficult to divine the reasons why Aristotle is calling attention to a term that is in common or general use. Consider the following instance. At *De Gen. et Cor.* I.1, Aristotle makes the point that alteration is an observable phenomenon. He writes: 'For in the same way that we see a substance, which stays the same, change in respect of size, [that is] so-called growth and diminishing (τὴν καλουμένην αὔξησιν καὶ φθίσιν), thus also we see alteration' (314b13-16). Why does Aristotle draw attention to the term αὔξησις, and presumably also to φθίσις, in this manner? Commentators who fasten onto the references to τὰ καλούμενα στοιχεῖα later on in the *De Gen. et Cor.*, and invest in that use of καλούμενος significant theoretical claims, are curiously silent about ἡ καλουμένη αὔξησις, so we find little guidance from that quarter.

If we begin by wondering how the expression is to be completed, presumably we must say that everyone calls the change in size of a substance αὔξησις, or φθίσις if it is a decrease in size we are talking about. For these terms seem to be terms in common use, and they are being used here in their 'ordinary' sense (Cf. *Phaedo* 71b).[21] So here we have a commonly used term, that names an everyday phenomenon; yet Aristotle is drawing attention to it. Why? It seems that the answer is quite simply that the notion of

[21] The 'ordinary' usage is when the term is used strictly (κύριῶς), or properly (οικειῶς); it expresses the actual or current sense in which everybody usually uses the word. See, for instance, *Poetics* 21, 1457b3-4; and cf. *Rhetoric* III.2, 1404b5-6. For the use of οἰκείος and κύριος, see *Rhetoric* III.2, 1404b31-32; cf. *Rhetoric* III.10, 1410b12-13. See also H.G. Liddell and R. Scott *A Greek-English Lexicon*, 9th edn, revised by H.S. Jones (Oxford, 1940), s.v. κύριος.

growth, that is, the nature of this phenomenon, is problematic. At the beginning of *De Gen. et Cor.* I.2, Aristotle mentions growth as one of the subjects to be discussed, alongside generation and corruption and alteration (315a26-29), and he proceeds to complain that none of his predecessors, apart from Democritus, have examined these subjects in any great depth (a34-35). No one has said anything about the nature of growth, for instance, beyond the obvious, that is, that things grow by the accession of like to like. But the problem is to explain *how* this accession occurs (315b1-3). Aristotle addresses this problem at *De Gen. et Cor.* I.5, where, apart from distinguishing growth from other changes like alteration and generation, he sets out his task as the attempt to figure out how the things that grow, grow, and the things that get smaller, get smaller (320a8-10).

What I think we can take from this is that a plausible reason why Aristotle qualifies the common word 'growth' in the very first chapter of the *De Gen. et Cor.* is precisely because the nature of growth, that is, what it is, how it occurs, is not clear, and demands investigation. There is no doubt that growth does occur; the qualifier καλούμενος expresses no doubt or scepticism on this point. People talk about growth: they say this gets bigger, or that gets smaller, and we see these things get bigger and smaller, but not much thought is given to how growth occurs, or what are its causes. In other words, growth is something not really understood: it needs looking into. What the qualifier καλούμενος does, then, is highlight the term, pick it out from our ordinary discourse, and identify the phenomenon it names as a possible subject for discussion.

Other instances of the use of καλούμενος show, however, that it is sometimes difficult to distinguish (a) the 'neutral' from (c) the 'technical' use. The participle features heavily in the biological works *De Generatione Animalium,* the *Parts of Animals,* and the *Historia Animalium*. In the latter it appears on almost every page. Among the items qualified by καλούμενος are body parts, organs, and other biological phenomena,

and the names of different species of animals, particularly marine life. Why does Aristotle feel it necessary to qualify so many terms of biology or natural history as 'the so-called *x*'?

Take, for instance, the term for the menses, τὰ καταμηνία. It appears to be the common name for the menses.[22] But Aristotle qualifies it as the 'so-called menses' (τὰ καλούμενα καταμηνία, *GA* I.17, 721b5; I.19, 727a2, 727b11; *HA* III.19, 521a26; VII.1, 581b1).[23] Why? One might wonder whether this has something to do with the literal meaning of the term—'the monthly coming-downs'.[24] One might even be tempted to conjecture that Aristotle draws attention to it because it is euphemistic, were it not of the lack of evidence of any other term for the menses. A better suggestion is that it may be the case that, as with the instance of 'so-called growth', Aristotle is qualifying it to indicate that it names a phenomenon that requires further investigation. And indeed, at least on one occasion, this seems to be what we find (*GA* I.17, 721b5).

On the other hand, it is a little bit vague to identify a term as being the 'common name' for something, until we clarify *for whom* it is the common term, that is, whether it is so for 'everyone', or the audience one is addressing, or some other discrete group. Elsewhere, for instance, Aristotle refers to 'what women call the forewaters' (ὁ καλούμενος ὑπὸ τῶν γυναικῶν πρόφορος, *HA* VII.7, 586a28), that is, the bloody liquid between the womb and the outer membrane in pregnant women. It doesn't seem overly speculative to suggest that other terms to do with women's bodies, such as the

[22] L. Dean-Jones *Women's Bodies in Classical Greek Science* (Oxford, 1994), p. 132.

[23] Even in Hippocratic writings the term appears thus qualified; see *Places in Man*, 47.9, 47.31, 47.61.

[24] Dean-Jones *Women's Bodies*, p. 4. Of course, the term 'menses' itself retains this root, being the plural of the Latin *mensis* or month.

menses, may also be best understood with the implied completion ὑπὸ τῶν γυναικῶν.[25] In a similar fashion, in cases involving marine biology, 'so-called' should probably be completed as 'by the fishermen' (ὑπὸ τῶν ἁλιέων), who are the experts in this area; indeed we find this expansion at *Historia Animalium* V.12, 544a12. For it seems likely that Aristotle received much of his information about marine biology, or at least the terminology, from experienced fishermen (cf. *HA* IV.7, 532b20. What I am suggesting is that Aristotle introduces a term qualified by καλούμενος because this is what a particular group of people—women, fishermen, people from a particular geographical area—call this thing, whatever it is. So the term qualified is in common use by these people, but not by everyone.

A plausible general reason, or guiding hypothesis, then, for Aristotle's frequent use of καλούμενος in the biological works is that he is aware that the audience he is addressing may not be familiar with many of these terms. Perhaps some of these terms *are* well known, but it is a pedagogical virtue not to presume that everyone in one's audience will be familiar with the names of the things of which one intends to speak. What Aristotle may want to do, then, is to highlight certain terms that could well be unfamiliar. That some names of human and animal body parts are unfamiliar to his audience is indeed suggested by the famous passage in the *Parts of Animals* I.5, where Aristotle is persuading his audience that the study of such parts, and of biology in general, is worthy of attention. It seems that the study of biology is quite foreign, and, for many of Aristotle's contemporaries, even distasteful (645a8-645a30). So perhaps this is why we find καλούμενος used so often in these works. The use of 'so-called' in these cases is certainly 'neutral', since it is a matter of fact that a particular group of

[25] Other terms qualified by καλούμενος include: the uterus or womb (*GA* I.2, 716a33); the umbilical cord (*GA* II.4, 740a30, 32; IV.8, 776a26), wind eggs (*GA* I.21, 730a2; III.2, 753a22), moles (as in molar pregnancies: *GA* IV.7, 775b25, 776a13; *HA* X.7, 638a24).

people—fishermen, women—call these things by such and such a name; yet it is also 'technical', for beyond these groups there is likely to be unfamiliarity with the name itself or with its meaning in certain contexts. In such cases, that is, when the term qualified is specific to a certain discipline, the meaning of καλούμενος may be expanded to καλούμενος ὑπό τινων, that is, called or known as such by some privileged group of specialists. Arguably whenever 'so-called' can be paraphrased as 'commonly called' what is intended is 'commonly called by a particular group or community'. But, whether we identify it as 'neutral', 'local' or 'technical', what is clear from these cases, once again, is that Aristotle's use of καλούμενος is certainly not indicative of scepticism towards the propriety of the application of these names.

Sometimes, however, Aristotle gives specific, narrow meanings to terms that may be familiar but understood in a different sense, and he refers to these as 'so-called'. Such uses of καλούμενος correspond more exclusively to a 'technical-novel' use. At *De anima* I.3, Aristotle refers to 'so-called *nous*' (ὁ καλούμενος νοῦς) in the midst of a critique of Plato's account of the soul (407a4-5). He states that Plato must mean by 'soul' (ψυχή) that part of the soul that is called *nous*. Earlier, Aristotle had referred to 'so-called *nous*' while discussing Anaxagoras' concept of *nous*, and he seems to be making a similar point. Anaxagoras believed that *nous* was in all living things, whether great or small; but, Aristotle objects, so-called *nous* in the sense of *phronesis*, or intelligence (ὅ γε κατὰ φρόνησιν λεγόμενος νοῦς, I.2, 404b5) does not seem to belong to all living things—not even, he adds a little mischievously, to all men. But what is ὁ καλούμενος νοῦς, and who calls it thus, and why?

It would seem that Aristotle is referring to the way that he conceives of *nous*. This suggestion gains support from later instances of the phrase in the *De anima*. For instance, in *De anima* III.4, Aristotle identifies that part of the soul by which it thinks and knows as 'what is called *nous*' (ὁ καλούμενος τῆς ψυχῆς νοῦς, 429a22), and proceeds

to state that what he means by *nous* is that part of the soul that thinks and forms judgements. When he next refers to 'what is called *nous*', it is this notion that he has in mind—he refers to 'the logical (or judging) faculty, that is, the so-called *nous*' (τὸ λογιστικὸν καὶ ὁ καλούμενος νοῦς, III.9, 432b26). Now it is not obvious that everyone would commonly think of *nous* just as that part of the soul that thinks and judges; it is usually thought to be something more general, like mind, sense, or even feeling.[26] So the fact that Aristotle would seem to have narrowed his notion of *nous* to the part of the soul that thinks and judges, and that he refers to this as ὁ καλούμενος νοῦς, suggests that, when he uses this phrase, he is talking not of ordinary notions of *nous*, but of 'what is called *nous* in our technical sense'.[27] As Hicks puts it, 'the use of the participle here and at 407a4 does not imply that the term is misused… [i]t seems to import '*nous* in the sense in which we use the word".[28] Hence the phrase 'the so-called *nous*' certainly does not imply a sense of dissatisfaction with that which is called *nous*.

But are there any examples of sceptical uses? The following instances might be thought to feature such uses of καλούμενος. Aristotle sometimes refers to the doctrines of a group called 'the so-called Pythagoreans' (*Metaph.* I.5, 985b23, I.8, 989b30; *De caelo* II.2, 284b7, *Meteor* I.7, 345a13); on two occasions, he refers to 'the Italians, the ones called 'Pythagoreans',' (οἱ περὶ τὴν Ἰταλίαν, καλούμενοι δὲ Πυθαγόρειοι, *De caelo* II.13, 293a20; cf. *Meteor* I.6, 342b30). It has been claimed that Aristotle refers to these Italians

[26] See LSJ s.v. *nous*.

[27] For a similar 'technical' use, compare the use of καλούμενος with reference to φορὰ, at *Physics* IV.1, 208a31-2, with *Physics* V.2, 226a32-3; cf. VIII.7, 260a28. See also Ross *Aristotle's Physics*, p. 625.

[28] R.D. Hicks *Aristotle De anima, with translation, introduction and notes* (Cambridge, 1907), p. 480 .Cf. *GA* II.3, 737a10.

like so because they were not really Pythagoreans at all.[29] This seems rather an extreme view. Others suggest more moderately that καλούμενος here is meant to convey Aristotle's scepticism not about whether or not these people are really Pythagoreans, but rather about *how much* of the teachings of these 'Pythagoreans' derives from Pythagoras.[30] There certainly does seem to be a reticence on the part of Aristotle, and also Plato, towards ascribing doctrines to Pythagoras himself. Plato refers to Pythagoras by name on one occasion only, and Aristotle no more than twice, and indeed one of these is thought to be by a later hand.[31] Ross and others suggest that their reticence indicates that Pythagoras was already something of a legendary figure.[32] If this is the case, then it seems natural that there would be hesitation on Aristotle's part about ascribing certain doctrines to the figure of Pythagoras. But hesitation, and reticence, is surely not the same as *scepticism*. Ross' explanation of Aristotle's use of the phrase thus remains the most attractive: 'there is a set of people commonly called Pythagoreans, but Aristotle will not vouch for the origin of any of their doctrines in Pythagoras himself'.[33] This view amounts to an agnosticism, or a withholding of commitment, rather than outright scepticism.

An initially more promising instance of the use of καλούμενος implying scepticism would seem to be Aristotle's references to the 'so-called poems of Orpheus'

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[29] E. Frank *Plato und die sogenannten Pythagoreer: Ein Kapitel aus der Geschichte des griechischen Geistes* (Halle, 1923), p. 77.

[30] Kirk, G.S., and J.E. Raven and M. Schofield *The Presocratic Philosophers: A Critical History with a Selection of Texts*, 2nd edn (Cambridge, 1983), p. 330.

[31] Ross *Aristotle's Metaphysics* I, p. 152.

[32] Ross *Aristotle's Metaphysics* I, p. 143, Kirk, G.S., and J.E. Raven *The Presocratic Philosophers: A Critical History with a Selection of Texts* (Cambridge, 1957), p. 218, n. 2.

[33] Ross *Aristotle's Metaphysics* I, p. 143. Cf. C. Huffman, *Philolaus of Croton: Pythagorean and Presocratic* (Cambridge, 1993), p. 32.

(for example, *De anima* I.5, 410b28, *GA* II.1, 734a19). On this Philoponus says that Aristotle uses καλούμενος here 'because it is unlikely that the verses are by Orpheus, as he himself says in the *de Philosophia*'.[34] So this may appear to be a straightforward case of a use of καλούμενος implying impropriety.[35] On the other hand, the contexts in which these instances occur seem surprising places for Aristotle to choose to reveal his doubts about the authenticity of the Orphic poems. In the first instance, Aristotle is talking about the nature of the soul, and considers, and rejects, a theory found in the 'so-called poems of Orpheus'; while in the second, Aristotle is discussing the development of the embryo, and whether its parts are produced simultaneously or, as suggested in the so-called Orphic poems, consecutively. Now although Aristotle is certainly drawing attention to these poems by qualifying them as 'so-called', it seems at least odd that he would want to distract his audience by suggesting, by implication, something rather irrelevant to his topic. (That, of course, is presuming that Aristotle's audience *would* be distracted by the suggestion that the poems of Orpheus are not really by Orpheus.) This matter would no doubt benefit from further investigation, but, taking the contexts into consideration, a more moderate option is again available, that is, that Aristotle is simply withholding his commitment to, or reserving his judgement upon, the authenticity of the Orphic poems.

Admittedly there are occasions when Aristotle refers to something as a 'so-called *x*', and then proceeds to say that it is incorrect to apply the name to that thing. For instance, in the *Meteorologica* he refers to the element fire as 'what we commonly call fire' (ὃ διὰ συνήθειαν καλοῦμεν πῦρ), and he immediately points out that it is not really fire (I.3, 340b22; cf. II.2, 354b25). Now this might seem to be a case where something

[34] *In de anima*, 15.186.24-25. See also Huffman *Philolaus*, p. 33.

[35] Indeed Herodotus is already referring to the 'so-called Orphic rites', which, he notes, 'are really Egyptian or Pythagorean' (*Histories*, 2.81.5).

is 'so-called' in the 'sceptical' sense (that is, the element is *merely* so-called fire). But it would be wrong to think that this is so. For on this occasion we discover that what is called 'fire' is not really fire precisely because Aristotle immediately and explicitly tells us. His point is that the element that is usually called 'fire' is something different from 'real' fire, that is, that which burns. The latter is an excess of heat and a boiling (340b23; I.4, 341b21), for example, flame. The element we habitually call 'fire' is not like this, although it is potentially like this (340b29). Aristotle does not rely on a 'sceptical' sense of καλούμενος to make this point. In other words, the weight of the denial that the element called 'fire' is really fire is not carried by the phrase 'what we commonly call fire'. Consequently this is not an instance of the use of καλούμενος that corresponds to (b) the 'sceptical' use of καλούμενος. Rather, what we have is the 'neutral' use, which fixes the reference, and this is followed by an unambiguous statement that the element that is commonly called 'fire' ought not to be confused with the fire of our quotidian experience.

5. The Significance of the Phrase τὰ καλούμενα στοιχεῖα

This selective, but, I think, fairly representative, survey shows that there is little or no evidence of a use of καλούμενος is thoroughly 'neutral' as to the propriety of the name that is given to things. It is always used to draw attention to usage, whether common or novel; but its employment does not also imply a critique of this usage. Aristotle introduces something as 'τὸ καλούμενον *x*' just in case the thing is called '*x*', whether by himself or others. It never follows that the name *x* is being applied correctly or not. In many cases the thing is correctly called *x*; but often Aristotle is just be stating that, as a matter of fact, something is called by a certain name by some people, or by most people, while withholding commitment to the propriety of the name as a name for that thing. As we have seen, on occasion something is described as a 'so-called *x*' and

Aristotle doesn't believe it is really an *x*, or that there is any such thing as an *x*: but he tends to make his disagreement quite explicit.

What this means is that there is no precedent in Aristotle for taking καλούμενος to have the implication required by the sceptical reading of τὰ καλούμενα στοιχεῖα. Therefore the sceptical reading must appeal to an unusual linguistic phenomenon whereby καλούμενος adopts the required implication only when it is used to qualify τὰ στοιχεῖα.[36] But it is implausible that it takes on a special significance only on these very specific occasions. Hence the sceptical reading of τὰ καλούμενα στοιχεῖα should be rejected. This leaves us with two possibilities: καλούμενος in τὰ καλούμενα στοιχεῖα corresponds either to use (a) or use (c). If the latter, then στοιχεῖα is a novel technical term for the basic material constituents of bodies. Such an interpretation has been put forward by Ross,[37] perhaps influenced by the view that Plato introduced the 'elemental' sense of the term.[38] Ross suggests that Aristotle's use of this phrase is evidence that στοιχεῖον in the 'elemental' sense is a usage not yet fully established.[39] But I reject this suggestion; nor would I accept that στοιχεῖον is a term familiar in other senses, for instance the 'alphabetic' sense, which is now being used in a novel, 'elemental', sense. Firstly, this suggestion fails to account for the fact that later Greek philosophers continue, albeit infrequently, to use the expression τὰ καλούμενα στοιχεῖα;[40] secondly,

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[36] Cf. Hicks, *Aristotle De anima*, p. 480: After noting that the use of καλούμενος in the phrase ὁ καλούμενος νοῦς does not imply misuse (see note 18), Hicks immediately points out that 'this is sometimes the case, for example, τὰ καλούμενα στοιχεῖα'. Unfortunately he provides no other example of a use of καλούμενος that implies misuse.

[37] Ross *Aristotle's Metaphysics*, I, p. 294.

[38] See Diels *Elementum*, p. 17, also W. Burkert, '*Stoicheion*', in *Philologus*, 103 (1959) 167-97, pp. 174-176.

[39] Ross later changed his mind in favour of the sceptical reading *Aristotle's Physics*, p. 484.

[40] See, for instance, Sextus Empiricus, *Outlines of Pyrhonism* III.62, Plotinus, *Enneades* III.1.3.2.

the use of στοιχεῖα in the sense of principles or constituents of bodies seems already to be well-established by Plato's time.[41]

Nevertheless it might be thought that στοιχεῖον in the 'elemental' sense is still a technical term, familiar perhaps only to a specific audience, namely, philosophers. If this were the case, τὰ καλούμενα στοιχεῖα would simply mean 'the things philosophers call the elements'.[42] Now if Aristotle is addressing the community of philosophers, one might wonder why he would use such a description. Perhaps, then, he uses the phrase only in his more exoteric writings. But whatever the audience there is a difficulty here. For τὰ καλούμενα στοιχεῖα refers exclusively to fire, air, water, and earth, while Aristotle's philosophical contemporaries, for example the Platonists, are certainly not all in agreement that these items are the elements. At best it seems that τὰ καλούμενα στοιχεῖα could be expanded into 'what are called elements by *some* philosophers', namely those who posit one or more of fire, air, water, and earth, for example, the Milesians and Empedocles. It is reasonable, however, to think that the ideas of these philosophers have long gained popular acceptance beyond the Academy and the Lyceum. That fire, air, water, and earth are the material constituents of things does indeed appear to be already something of a commonplace by Plato's time.[43] Hence it is plausible to think that Aristotle uses the phrase τὰ καλούμενα στοιχεῖα to pick out what are popularly thought to be the elements of bodies. The sense of

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[41] Aristotle is already referring—without qualification— to the 'solids', that is, fire, air, water, and earth (cf. *Timaeus* 53d) as στοιχεῖα as early as the *Protrepticus* (fr. 33, l. 9). For criticism of the view that Plato introduced this sense of στοιχεῖον, see Crowley 'On the Use of *Stoicheion*', pp. 367-394.

[42] Charlton's interpretation, *Aristotle's Physics Books I and II, translated with an Introduction and Notes* (Oxford, 1970), p. 46.

[43] See *Timaeus* 48b-c, and Crowley 'On the Use of *Stoicheion*', p. 378f.; cf. also *Philebus* 29a10f., *Cratylus* 408d, *Protagoras* 320d.

καλούμενος to qualify στοιχεῖα would consequently be (a) the 'neutral' sense. In other words, the phrase τὰ καλούμενα στοιχεῖα implies nothing more than that fire, air, water, and earth are called στοιχεῖα, either commonly, which seems likely, or at the very least by a some specific group of people.

I conclude, then, that Aristotle uses τὰ καλούμενα στοιχεῖα simply to fix the reference to the four elements of bodies fire, air, water, and earth. All that is meant by the phrase is that, as a matter of fact, some, perhaps most, people call fire, air, water, and earth στοιχεῖα, or 'elements'. There is no linguistic basis for the view, widespread among modern commentators, that τὰ καλούμενα στοιχεῖα implies that Aristotle does not believe that fire, air, water, and earth are the genuine elements. What I call the 'sceptical reading' is arguably unduly weighted by a narrow interpretation of the meaning in English of the participial adjective 'so-called'. It must be acknowledged, however, that it does not follow from this conclusion that Aristotle himself believes that fire, air, water, and earth are the genuine elements. Rather, my argument is just that the use of καλούμενος does not imply impropriety. But it is important to remember that one could introduce something as the 'τὸ καλούμενον *x*', meaning simply that it is commonly called *x*, and then proceed to argue or to show that the name is for some reason inappropriate. In other words, Aristotle could well be remarking upon contemporary usage, only later to criticise and to distance his own view from that usage, and eventually, perhaps, to identify other things as the genuine elements. So it is still to be determined whether Aristotle does so or not. This, however, is a task for another day.[44]

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[44] I make a start upon this task in Crowley, '*De Gen. et Cor.* II..3: Does Aristotle Identify the Contraries as Elements?', *Classical Quarterly* (forthcoming).

Editorial Queries

p. 5 Following the *De Gen. et Cor.* I.6 ref, you write "He is asking, in other words, whether the so-called elements are *as Empedocles conceives of them*, that is, eternal, or not." Is this what you meant to write? It's not obvious what point this is intended to make in context. The *GC* passage doesn't mention Empedocles. And in context you appeared to have been making the point that 'so-called elements' precisely is not equivalent to elements posited by Empedocles.
p. 5 In same paragraph, in sentences 'Indeed the very fact...' and 'For it would be worth pointing this out only if it is relatively common for fire, ...'. Put this way the two sentences are in tension. Your point could be made more clearly by adding 'relatively common for *one or more of* fire, air, ...'?
p. 10 line 5 from bottom: in sentence 'Identifying an instance of the use of *kaloumenos* as an instance of use (b) is thus..." should "b" be "a"? (If it isn't, "thus" is somewhat misleading and the train of thought a little unclear.)
If you could provide a view as to how, if at all, you might clarify the first two cases and a decision on the third, I can mark up the hard copy with appropriate corrections when it comes to me before sending to Brill. Then, everything is in order in good time, I think.
Lastly, could you send me a word count (including notes) on the final version?

Reply

Regarding the queries:

1. The point I was trying to make on p. 5, but obviously failed to make clearly, is this:

The so-called elements are the things people often or usually name as the elements, and these are fire, air, water, and earth. My suggestion is that, when people say that fire, air, water, and earth are the elements, it is not that they are saying that Empedocles was right in naming these; they might not even think of Empedocles when they say that fire, air, water, and earth are the elements of bodies; moreover, they probably don't think very much about them, for instance, about the nature of the elements. In other words, there is something unreflective about the tendency to name fire, air, water, and earth as the elements, as indeed I take Plato to be saying at *Timaeus* 48b-c. So at GC I.6 Aristotle asks whether they are eternal or whether they come to be in someway. Now Empedocles of course says that they are eternal; already at I.1, 315a4-8, we have Aristotle stating that Empedocles denied that the elements come to be from one another. So my thought was that Aristotle is asking whether these things that we usually take to be the elements, fire, air, water, and earth, are to be understood as eternal, that is, as Empedocles understood them, or not. (Actually it might be better to say ‘for example, rather than ‘that is’, as Empedocles is certainly not the only one to conceive of them in this way). That Aristotle could even be asking this question, I thought, shows that the phrase ‘the so-called elements’ does not refer exclusively to Empedocles’ elements. (Of course, if it turned out that we should conceive of the so-called elements as eternal and unchangeable, then the so-called elements would be as Empedocles conceives of them.)
Joachim on this passage writes: ‘If they are *stoicheia*, they must be *aidia*, as, e.g., Empedocles maintained’ (138)—my idea is that: ‘if the *stoicheia* are *aidia*, then they are as, e.g., Empedocles maintained’.
Is that ok? If you think it makes better sense now, then a possible rewrite could be as follows:

Further evidence that this is so appears to be available at *De Gen. et Cor.* I.6, where Aristotle raises the question whether the so-called elements are eternal (□⇔διον), or whether they come to be in some way (322b1-3). Now Empedocles, of course, conceives of fire, air, water, and earth as eternal, that is, unchangeable (*De Gen. et Cor.* I.1, 315a3-5, II.1, 329a35-b2). So at *De Gen. et Cor.* I.6, the question Aristotle is raising might be paraphrased: ‘Are the so-called elements fire, air, water, and

earth eternal, as, for instance, *Empedocles* conceives of them, or not?' Presumably this is not a question that would arise if the phrase *ta kaloumena stoicheia* was simply a way to refer to Empedocles' elements.

2. The second query about p. 5.

This is misleading as it stands. I should be saying:

"For it would be worth pointing this out only if it is has since become relatively common, among Aristotle's contemporaries, to identify fire, air, water, and earth as the elements."

(With apologies for a football analogy, it's a bit like pointing out that the Brazilian footballer Bebeto was the first to do that rather annoying 'rocking the baby' celebration after scoring a goal. You point it out because so many footballers do it now, and whether any of them, or the spectators, are aware of Bebeto's precedent is doubtful.)

3. Yes that is a mistake, it should be (a) not (b).

The word count on what I sent was 8181; if the emendations of the queries is acceptable, it will go to: 8243