

CHAPTER I

When Did Kosmos Become the Kosmos?

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When did *kosmos* come to mean 'the *kosmos*', in the sense of finite 'world' or 'world-order'? This question fascinated historians of philosophy both in antiquity and throughout the last century, from Walther Kranz in the early 1930s to Jaap Mansfeld in the early 1970s. During that period, it was treated by many eminent scholars, most of whom, it will be of no surprise, reached divergent conclusions. Charles Kahn, adapting arguments by Reinhardt, Kranz and Gigon, believed that Anaximander was the first person whom we know to have referred to multiple *kosmoi*, in the sense of sub-orders of the world; it is thereby understood that *kosmos* seems to offer some traction to Ionian science, despite the troubling fact that there is not a single surviving reference to *kosmos* meaning 'world-order' unambiguously among the fragments of the Ionian *physikoi* until Diogenes of Apollonia (fl. after 440 BCE).¹ Geoffrey Kirk argued that prior to Empedocles, Diogenes and possibly Philolaus of Croton, various senses of 'order' are implied in the use of the term *kosmos*, but only with these mid- to late fifth-century BCE figures does the sense of 'world-order' come to be dominant.² Jaap Mansfeld followed Kerschensteiner in rejecting the links to Anaximander, but he also excused himself from the debate concerning who first spoke of the world-order as a *kosmos*, suggesting without further argument that 'it may have been Pythagoras or one of his early followers'.³ With the exception of two scholars, Carl Huffman and Aryeh Finkelberg, nobody to my knowledge since Mansfeld in the early 1970s has developed a detailed analysis of this fascinating question.⁴ Huffman has cautiously

¹ Cf. Kahn 1960: 219–30.

² Cf. Kirk 1962: 311–16. On Parmenides, see Furley 1987: 49–60 and Arnaud Macé's contribution to this volume (Chapter 2).

³ Mansfeld 1971: 42–45.

⁴ See Finkelberg 1998 and Huffman 1993: 97–99; Graham (2006: 26) avers discussing this problem extensively, instead claiming 'it is a fact that from Anaximander on, philosophers were attempting to explain the *kosmos*, whether they had a word for the world or not'. In my opinion, this is a potentially

suggested that Heraclitus' use of the term 'seems to mark the transition' to the sense of 'ordered whole' but that it is with Empedocles that we get the meaning 'world', and with Philolaus the meaning becomes 'world-order';⁵ alternatively, Finkelberg argues that the '*kosmos*'-fragments of Philolaus are likely to be a post-Platonic forgery, and that it is with the later Platonic dialogues, especially *Timaeus*, *Statesman* and *Philebus*, that the word *kosmos* first comes to mean 'world-order'.⁶

So at one end, we have Charles Kahn's influential argument – still accepted by some scholars today⁷ – that it is with Anaximander, at the fountainhead of Milesian scientific inquiry sometime in the mid sixth century BCE, that we have the first use of the term *kosmos* to refer to a 'world-order', or, to be more precise, multiple 'world-orders' (*kosmoi*); and at the other end, we have Aryeh Finkelberg, who believes that such a distinction should be associated in the first with the dialogues Plato penned in his advanced age, in the 360s–50s BCE. Two hundred years of philosophical history separate these two possible termini. Clearly, then, a debate is still to be had. In this chapter, I would like to make my own contribution by focusing on an aspect of the question that has tended to fall by the wayside, generally speaking, namely the evidence to be found in the doxography concerning the term *kosmos* and its meanings. One might dismiss doxographical reports that relate to the topic of the origins of the concept of the *kosmos* on the grounds that they are simply 'late', or Platonising or coloured by Peripatetic or Stoic modes of classification. Such a dismissal of the doxography, in my opinion, would be born out of a hyper-scepticism concerning the reliability of the doxographical traditions or of a distrust of the programmatic intentions of the authors who sought to provide classifications of the ideas they found associated with major philosophers who came before.⁸ Scholarship since the early 1990s has sought to obtain a more nuanced approach to the study of doxography, and the study of Aristotle and other early historians of philosophy and science within the Lyceum, such as Theophrastus, Eudemus and Aristoxenus, has seen significant advances in the past twenty years with the advent of new critical

confusing claim, especially given the fact that it does not differentiate between the '*kosmos*' and any other type of universal construct, whether finite or infinite (cf. Furley 1989: 2). Other scholars are less incautious: see, for example, Wright (2008: 413), who, in my view, correctly identifies the proper object of study and explanation among the earliest Milesians as 'all things' (πάντα), 'the all' (τὸ πᾶν) or 'the whole thing' (τὸ ὅλον). Also cf. Hussey 1995: 530–1.

⁵ Huffman 1993: 97–98. ⁶ Finkelberg 1998: 127–28 with n. 92.

⁷ Including Schofield, in his contribution to this volume (Chapter 3).

⁸ See, for example, Kerferd's review of Kerschensteiner's book (1964: 183).

editions, commentaries and discussions.⁹ Moreover, especially within the past decade, the field has seen a similar growth in study of the relevant areas of Platonic philosophy and Pythagoreanism, with scholars seeking to revive the critical discussion of what to us seem to be relatively obscure figures whose imprint upon the traditions of Platonic and Pythagorean thought bears the signs of sophistication and intellectual value.¹⁰ Given the state of the history of philosophy today, it would be uncharitable at best, and out of touch at worst, to consign later doxographical reports to the dusty shelves of mere antiquarianism.

Now the most decisive report from antiquity which expressly associates the first use of the term *kosmos* with some sort of order within the universe comes from the sceptic philosopher Favorinus of Arles, a rough contemporary of Plutarch who was also critiqued by Galen; hence his activities can be dated to the late first or early second century CE.¹¹ In a work titled *History of All Sorts*, he appears to have devoted at least one book (Book 8) to heurematography, that is, to the recording of 'first discoveries' in philosophy and science:¹²

Favorinus says that he [sc. Pythagoras] (was the first) to employ definitions in the subject of mathematics; and Socrates and his disciples extended this, and afterwards Aristotle and the Stoics; moreover, he [sc. Pythagoras] was the first to call the heavens '*kosmos*' [τὸν οὐρανὸν πρῶτον ὀνομάσαι κόσμον], and the earth round; according to Theophrastus, however, it was Parmenides; and according to Zeno¹³, it was Hesiod. (Favorinus Fragment 99 Amato = Diogenes Laertius 8.48)

This testimony has received very little commentary, and its content is almost universally rejected.¹⁴ But I think it deserves a closer look. When scholars tend to cite this fragment of Favorinus, they unfortunately tend to leave out the first portion, which actually bridges the section of relevance for our study, namely the claim that Pythagoras 'was the first to call the heavens "*kosmos*"', with other useful information concerning Pythagoras' proposed intellectual activities. Pythagoras is there credited with being an

⁹ See, inter alia, Mansfeld and Runia's three volumes devoted to *Aëtiana* (1997–2010) and Zhmud 2013 (for an alternative perspective).

¹⁰ See Palmer 2014; Horky 2013; and Bonazzi, Lévy and Steel 2007.

¹¹ For Favorinus' Academic Scepticism, see Ioppolo 1993. ¹² Cf. Zhmud 2006: 176 n. 39.

¹³ We do not know for sure who this Zeno is, but one possibility is Zeno of Citium.

¹⁴ As it is, for example, by Macé in Chapter 2. One exception has been Kerferd (1964: 183). It is likely that the references at the end of Theophrastus and Zeno are focused on who was first to refer to the earth as round and not to the concerns over who first used *kosmos* to refer to 'heavens'. Favorinus appears to be arranging the positions dialectically.

innovator in the use of definitions in mathematics, followed interestingly by Socrates and the Socratics, and then Aristotle and the Stoics. So Favorinus' doxographical source, whoever it was, appears to have established a philosophical lineage from Pythagoras to the Stoics based on the use of definitions in mathematics; and somewhere (perhaps nearby in his source?), Favorinus found Pythagoras being credited with 'first discoverer' (*prôtos heuretês*) of the use of the term *kosmos* to refer to the heavens.¹⁵ Are these two aspects connected? We have evidence from other works that Favorinus devoted some energy to the history of mathematics: he appears to have claimed that Plato was the discoverer of the method of analysis in mathematics and that he was an innovator in the development of mathematical terminology.¹⁶

With the focus on Pythagoras' innovations in mathematics and cosmology, Favorinus reflects what seem to have been commonplaces by, at the latest, the beginning of the second century CE, especially in doxographical accounts that show themselves to be under the influence of Stoic, Middle Platonist and Neo-Pythagorean conventions. It is also the case in other, roughly contemporary and earlier reports of Middle Platonists that testify to Pythagoras' innovations in mathematics and cosmology.¹⁷ For example, there is the account from the anonymous *Life of Pythagoras*, likely composed in the first century BCE (perhaps by Eudorus of Alexandria, or someone in his philosophical circle there), which features explanation through etymologisation, a familiar trope from Stoic and later Neopythagorean philosophy: 'Pythagoras was the first to call the heavens "*kosmos*", because it is perfect and adorned with all the living beings [stars?] and the fineries [*πρῶτος Πυθαγόρας τὸν οὐρανὸν κόσμον προσηγόρευσε διὰ τὸ τέλειον εἶναι καὶ πᾶσι κεκοσμηθῆναι τοῖς τε ζώοις καὶ τοῖς καλοῖς*]'.¹⁸ Given the complexities that attend Hellenistic and Post-Hellenistic Pythagorean doxography, it is difficult to know with confidence what Favorinus' immediate sources might have been; but it is important to note that his information differs quite substantially from, for example, that employed by another sceptic

¹⁵ On Favorinus' preservation of information that ultimately appears to trace back via Eratosthenes to Eudemos of Rhodes, see Zhmud 2006: 176 and 249.

¹⁶ Diog. Laert. 3.24 = Favorinus Fr. 62 Amato. Favorinus also suggested that Anaximander had invented the gnomon and set it up in Sparta in order to indicate solstices and equinoxes. For discussion of the scientific plausibility of this statement, see Evans 1998: 56.

¹⁷ Discoveries of the mathematical means in particular are attributed to Pythagoras by Nicomachus (*Ar.* 2.28), and it became a commonplace to associate the discovery of 'Pythagoras' theorem' with Pythagoras by the first century BCE (on which, see Zhmud 2012: 267).

¹⁸ Anon. Phot. *Bibl. Cod.* 249.440a 27–29 = Thesleff p. 240.3–5.

(of a more distinctly Pyrrhonian variety), Sextus Empiricus, when he sought to describe 'Pythagorean' arithmetic.¹⁹ The attribution of specific scientific discoveries in mathematics to Pythagoras, to be sure, antedates the Post-Hellenistic period, as it has its origins in the writings of Aristotle, the Early Peripatetics and the Early Academy in the fourth century BCE.²⁰ For example, Aristotle argued that the Pythagoreans were the first philosophers to employ crude definitions, followed by Socrates, who also employed definitions in ethics (Arist. *Metaph.* 1.5.987a13–27; cf. Arist. Fr. 203 Rose³);²¹ and Aristotle more explicitly associated Pythagoras himself with definition (of some sort) as well as observation of the heavens as a θεωρὸς τῆς φύσεως in his lost, but very influential and well-distributed, dialogue *Protrepticus*.²² Similarly, Aristotle's junior associate Aristoxenus claimed that Pythagoras invented weights and measures, identified the Evening and Morning Stars with Venus (Fr. 24 Wehrli) and advanced the subject of mathematics, which had originally been discovered by the Egyptian god Thoth (Fr. 23 Wehrli).²³ Aristotle's contemporary Heraclides of Pontus, who was in antiquity associated with both the Academy and the Lyceum, portrayed Pythagoras in a dialogue as the *prôtos heuretês* of the actual term *philosophy* (*philosophia*), which Heraclides himself also seems to have associated with an Aristotelian notion of theoretical or first philosophy;²⁴ Xenocrates, the second successor in the Academy to Plato who was a direct competitor of Aristotle, attributed the discovery of harmonic intervals to Pythagoras;²⁵ and Aëtius, whose chief source concerning first discoveries may have been Aristotle's successor Theophrastus, claimed that 'Pythagoras was the first to call the enclosure of totality [τὴν τῶν ὅλων περιοχὴν] "*kosmos*" because of its inherent arrangement'.²⁶

¹⁹ Sext. Emp. *Math.* 4.2. In the first century BCE, Alexander Polyhistor also claimed (*ap.* Diog. Laert. 8.25) that the four elements 'change and turn into each other completely, and what is generated from them is a *kosmos*, ensouled, intelligent, spherical, which holds the earth as its centre – the earth too being spherical and inhabited in the round'. This is a far cry from Favorinus' position. Ju (2013: 113–16) has suggested that Poseidonius might be the source behind Sextus' analysis of Pythagorean dogmatism, but see the hesitation of Brennan 2015.

²⁰ Generally, see Zhmud 2006: Chapter 6, although I do not agree with all of his conclusions.

²¹ On Pythagorean definition, see Horky 2013: 29–30.

²² Arist. *Protr.* B 16 and B 18 Düring. Cf. Horky 2013: 52. On the later history of *contemplatio mundi*, see especially Germany's contribution to this volume (Chapter 10).

²³ On this subject, see Horky 2013: 45–46 and Zhmud 2006: 224–27.

²⁴ Generally, see Dillon 2014: 257–60. ²⁵ Fr. 87 Isnardi Parente = Porph. *In Ptol. Harm.* 30.1.

²⁶ Aët. 2.1.1 (Diels, *Dox. Graec.* 327). Contrast the report of Achilles (ad loc.) which claims that Pythagoras 'referred to the universe as "*kosmos*" because of *diakosmêsis*; nobody prior to him did

In this way, then, the account of Favorinus concerning Pythagoras' innovations, especially in referring to the heavens as the *kosmos*, appears to be of a piece with earlier heurematographical accounts of Pythagoreanism from the middle of the fourth century BCE. Hence, we would be in danger of oversimplifying, and perhaps be simply mistaken, if we were to say of Favorinus' account that it has 'no historical value' whatsoever.²⁷ Of historical value to whom, and when? Favorinus is participating in a heurematographical tradition that associates 'discoveries' in mathematics and astronomy to Pythagoras which traces back at least to Aristotle and the Early Academy.²⁸ In fact, this raises the possibility that Favorinus' heurematographical account, like those accounts of the anonymous first-century BCE author of the *Life of Pythagoras* preserved by Photius and of Aëtius, is reacting (in some way – perhaps dialectically, as Sextus did) to earlier doxographical statements concerning the cosmological or ouranological use of the term *kosmos*.

We can only speculate about what the sophists, such as Hippias of Elis, said about Pythagoras or what role they played in the development of the doxography concerning cosmology. Both Xenophon and Plato, writing in the first half of the fourth century BCE, lay the groundwork for a later aporia over who, in particular, was first in using the term *kosmos* to refer to the ordered universe. The account of Xenophon explicitly pits Socratic philosophy against speculation in natural science and by appeal to the peculiarity of the latter's inquiry into the '*kosmos*':

But no one ever heard or saw Socrates say or do anything profane or impious. For he didn't even discuss the nature of all things after the manner of most of the others, that is, by inquiring into how the '*kosmos*', as it is called by the professors, is, and by what laws each of the heavenly objects came into existence [περὶ τῆς τῶν πάντων φύσεως ἥπερ τῶν ἄλλων οἱ πλεῖστοι διελέγετο, σκοπῶν ὅπως ὁ καλούμενος ὑπὸ τῶν σοφιστῶν κόσμος ἔφυ καὶ τίσιν ἀνάγκαις ἕκαστα γίγνεται τῶν οὐρανίων]; instead, he demonstrated how those who pondered such subjects were engaged in sheer folly. In the first place, he would inquire regarding them whether they really thought that they had sufficient enough knowledge of human affairs to proceed onto speculation concerning these topics, or whether they believed

this'. This interpretation can hardly be right, since *diakosmêsis* is not obviously relevant to early Pythagoreanism (see Schofield's contribution in this volume [Chapter 3]).

²⁷ Kahn 1960: 219 n. 1.

²⁸ Aristotle too (*Metaph.* 14.3.1091a13–26), in his discussion of Platonist and Pythagorean mathematics, explicitly associates Pythagorean 'making of the *kosmos*' (κοσμοποιία) with natural philosophy: '[the Pythagoreans] are making the world and intend to speak in terms of nature' (κοσμοποιοῦσι καὶ φυσικῶς βούλονται λέγειν). On Aristotle's view of Pythagorean κοσμοποιία, see Horley 2013: 80–82.

that they were doing their duty by ignoring human affairs and investigating divine ones. (Xenophon, *Memorabilia* 1.1.11–12)

Here, Xenophon contrasts the investigative activities of the ‘professors’ (οἱ σοφισταί), whose approach to natural science focuses on the way in which the ‘*kosmos*’ came into existence and the laws in accordance with which the heavenly bodies were generated, with Socrates’ ethics. Xenophon emphatically marks the term *kosmos* as ‘called by’ (καλούμενος) the professors, thus differentiating their investigative approach to cosmology from a *more general* (τῶν ἄλλων οἱ πλεῖστοι) investigative approach to the nature of the universe, or, as he puts it, ‘the nature of all things’ (ἡ τῶν πάντων φύσις). Xenophon himself does not explicitly tell us who these ‘professors’ are. Just after this passage (*Mem.* 1.1.14), Xenophon differentiates, from among those who investigate the nature of the universe, the monists, who believe that there is ‘only one Being’, that ‘nothing is ever put into motion’ and ‘nothing is ever generated or corrupted’, from pluralists, who ascribe to nature ‘an infinity, the many’, as well as the notions that ‘all things are constantly in motion’ and ‘all things are generated and corrupted’. There is a clear differentiation being drawn between two types of philosopher who commit to diverse metaphysical positions, and the information appears to have had doxographical value.²⁹ The later explicit appearance of the name ‘Anaxagoras’ in the context of the sort of astronomy Socrates rejects (*Mem.* 4.7.6) might suggest the natural scientist from Clazomenae, and the obvious comparison with the famous passage of Plato’s *Phaedo* (96a ff.) might also recommend Anaximenes, Alcmaeon and Diogenes of Apollonia, as well as Philolaus and Empedocles.³⁰ Indeed, as I’ve argued elsewhere, the mathematical Pythagoreans Philolaus and Empedocles are likely to be in Plato’s crosshairs when he criticises those who engage in what Socrates calls περὶ φύσεως ἱστορία in the *Phaedo*.³¹ Generally, then, we might admit a plethora of possible intellectuals, and it seems unlikely that Xenophon would be interested in the question we’re interested in, namely who, precisely, these ‘professors’ are who commit to using the term *kosmos* and investigate the natural laws that brought it into existence.

²⁹ Palmer (2009: 532) sees a possible reference to Gorgias’ dialectical activities (cf. DK 82 B 1; Arist. [MXG] 979a13–18). It is likely that the sophists, indeed, were the first doxographers (cf. Hippias DK 86 B 6).

³⁰ Cf. Huffman 1993: 318.

³¹ Horky 2013: 175–76 and 194. On Socrates’ rejection of this activity, see Mansfeld 1990: 64–65. It may be worth noting that the earliest testimony we have concerning the intellectual activities of Pythagoras, that of Heraclitus B 129, associates his *historia* with his peculiar brand of *sophia*, although precisely what this activity called *historia* constituted remains the subject of scholarly debate. See Horky 2013: 209–10 and Huffman 2008.

An article by Aryeh Finkelberg (1998) has provocatively argued that those 'professors' who speak about the *kosmos* are, specifically, Plato and his associates in the Academy. He bases this positive claim on several arguments. First, he argues that uses of the term *kosmos* to refer to 'world' or 'world-order' in Plato's dialogues occur only in the late works, *Timaeus*, *Statesman* and *Philebus*.³² Earlier usages in *Gorgias* and *Phaedrus*, he contends, refer to 'heaven' rather than to a 'world' that is structured according to some rules or principles.³³ Second, he suggests that the *Memorabilia* 'cannot be earlier, or at least much earlier', than the *Timaeus*, which, in his estimation, was the first dialogue to use the term *kosmos* to mean 'world' or 'world-order' unambiguously.³⁴ Third, he notes – and I do think this is an important point – that Plato seems to highlight the terminological invention in the *Timaeus* (28b), through marked elaboration upon the more common word for 'heaven', οὐρανός, as well as in *Philebus* (29e), where Socrates speaks of 'that very thing which we call "*kosmos*"' (περὶ τοῦδε ὁ κόσμον λέγομεν).³⁵ Hence, so the argument goes, Plato exhibits propriety over the term and its particular usage.

Now Finkelberg's three arguments vary in terms of quality and all are problematic. The first argument is speculative and depends a lot on dating of the works of Plato, a notoriously difficult project. If, however, we accept the notion that the earlier dialogues (it's not at all self-evident that *Phaedrus* is earlier than *Timaeus* or *Statesman*, I should note) all assume that *kosmos* means 'heaven', then his first argument is weakened if, and when, we find an example that bucks the trend. The second is equally speculative, and more problematic, because it depends on the first argument: nobody, to my mind, has been able to prove that Xenophon's *Memorabilia* is earlier, later or contemporary with any dialogue of Plato; we simply cannot know. Finally, the argument that Plato shows proprietary usage over the term *kosmos* to refer to 'world-order' is worth testing by reference to one of Plato's 'early' dialogues (that much is agreed by most scholars), discussed extensively by many scholars both ancient and modern, in which Socrates expressly associates use of the term *kosmos* with 'wise' people *other* than himself:

Yes, Callicles, the wise men claim that partnership [κοινωνία], friendship and orderliness, temperance and justice [φιλία καὶ κοσμιότης καὶ σωφροσύνη καὶ δικαιοσύνη], hold together heaven and earth, and gods and men, and that is why they call the totality a '*kosmos*', my friend, and not

³² Finkelberg 1998: 127.

³³ Finkelberg 1998: 127.

³⁴ Finkelberg 1998: 129.

³⁵ Finkelberg 1998: 127–30.

a 'un-kosmos', nor even 'intemperance' [καὶ τὸ ὅλον τοῦτο διὰ ταῦτα κόσμον καλοῦσιν, ὧ ἐταῖρε, οὐκ ἀκοσμίαν οὐδὲ ἀκολασίαν]. I believe that you don't pay attention to these facts, even though you're a wise man in these matters. You've failed to notice that the geometrical equality has great power among both gods and men, and you suppose that you ought to practice getting the greater share. That's because you neglect geometry. (Plato, *Gorgias* 507e6–508a8)

Two things leap out of this remarkable passage. First, it is pretty clear that Socrates is *not* avowing proprietary use of the term *kosmos* but rather is using it within a broader explanation of why 'partnership' (κοινωνία), which is glossed as 'friendship and orderliness, temperance and justice' (φιλία καὶ κοσμιότης καὶ σωφροσύνη καὶ δικαιοσύνη), binds the representative aspects of the divine and the mortal, i.e. the divine and mortal regions (heaven and earth), and the divine and mortal occupants of those regions (gods and men).³⁶ Second, in order to explain to Callicles why he fails to understand what the 'wise men' say, namely that the right partnership between heaven and earth, gods and men, is a 'world-order' and not its opposite, Socrates appeals, perhaps surprisingly, to mathematics. Specifically, he refers to the 'geometrical equality' (ἡ ἰσότης ἡ γεωμετρική), which is said to hold powerful sway (μέγα δύναται)³⁷ over both gods and men; from this perspective, the geometric proportion is to be considered something like the means by which gods and men achieve the partnership (κοινωνία) they hold. The geometric proportion, as cited here, has been thought to be the equivalent to what the Athenian Stranger in Plato's *Laws* (757b–c) calls the 'judgment of Zeus' (Διὸς κρίσις), the proportion that 'distributes more to the greater and a smaller amount to the lesser' and is the principle of distributive justice in the fourth century BCE.³⁸

³⁶ Finkelberg (1998: 126) misconstrues the Greek by claiming that the rendering of κόσμος as 'world' or 'world-order' raises some problems. First, κόσμος is contrasted with ἀκολασία, but 'world' can hardly be the opposite of 'intemperance'. To be sure, κόσμος is explicitly contrasted with ἀκοσμία, then elaborated (οὐδὲ) to refer to ἀκολασία by Socrates in the context of his discussion with Callicles, the determined adherent to *pleonexia*. This is unsurprising as a Socratic dialectical appropriation. The contrasting of opposite elements through κόσμος and ἀκοσμία is not an invention of Plato: it is attested in other contemporary philosophical contexts, before (e.g. *Gorg.* *Hel.* 1 and *Pal.* 30) and after Plato (e.g. *Arist. Fr.* 17 Rose³).

³⁷ Is this a jab at Gorgias, who claimed (*Hel.* 8–9) that he could prove that 'speech is a great dynast, who achieves the most divine effects by employing the smallest and most invisible body' (λόγος δυνάστης μέγας ἐστίν, ὃς μικρωτάτῳ σώματι καὶ ἀφανεστάτῳ θεϊότατα ἔργα ἀποτελεῖ)? On the psychological power of Gorgias' *logos*, see Horky 2006: 375–79.

³⁸ Dodds 1959: 339, who cites Isocrates (*Areop.* 21) and Aristotle (*Eth. Nic.* 5.3.1131b13 and *Pol.* 5.1.1301b39). Burkert (1972: 78 n. 156) has argued, by contrast, that Plato must refer to something more general, something like the 'power of mathematics that governs the world' (citing ps-Aristotle's *Problemata* 16.9

To whom, then, is Socrates referring when he describes the saying of the 'wise men'? Many scholars have followed Dodds in assuming that the Pythagoreans are intended referents.³⁹ Dodds gained his insight from the Scholiast to Plato's *Gorgias* (Proclus?), who said of these 'wise men', 'he is speaking of wise Pythagoreans here, especially Empedocles, who declared that friendship unifies the sphere, and that it is the unifier [σοφούς ἐνταῦθα τοὺς Πυθαγορίους φησί, καὶ διαφερόντως τὸν Ἐμπεδοκλέα, φάσκοντα τὴν φιλίαν ἐνοῦν τὸν σφαῖρον, ἐνοποιοῦν εἶναι]'.⁴⁰ I will turn to consider Empedocles below, but let us begin by examining the surviving fragments of the early Pythagoreans, in order to test Dodds's hypothesis. Carl Huffman has argued that Plato has Archytas of Tarentum in mind when he refers to the 'geometrical equality' (but also others), and Fragment 3 of Archytas holds special relevance to our discussion:⁴¹

Once calculation was discovered, it put a stop to discord and increased concord. For there is no 'wanting more than one's share' [πλεονεξία τε γὰρ οὐκ ἔστι], and equality exists, once this [sc. calculation] has come into being. For by means of it [sc. calculation] we will seek reconciliation in our dealings with one another. Through this, then, the poor receive from the powerful, and the wealthy give to the needy, both in the confidence that they will have what is far on account of this [sc. calculation]. (Archytas of Tarentum DK 47 B 3 = Stobaeus 4.1.139, pp. 88.13–89.3 Hense)⁴²

It is true that a loose relationship obtains between Plato's account and Archytas' B 3, but there are at least three problems with determining too strong an association. First, Archytas does not expressly refer to the entity which eradicates *pleonexia* and promotes concord among the various groups as the 'geometrical equality' but rather calls that entity 'calculation' (λογισμός), which might be thought to *produce* a type of equality but *is not itself* an equality. Second, Archytas does not in his political thought describe 'calculation' as bringing gods and men together, but instead he refers to the wealthy and the poor. Indeed, references to divinity are notably absent in Archytas' fragments, with the exception of one testimony from Aristoxenus' *Life of Archytas* which might be thought to reflect

[= DK 47 A 23a] as comparandum). But see Huffman's reassessment of this testimony, in which he ingeniously argues that the 'proportion of the equal' which is ascribed to Archytas must refer to the arithmetical proportion (Huffman 2005: 529–40).

³⁹ Dodds 1959: 338–39. See Finkelberg 1998: 126 n. 87.

⁴⁰ Schol. *ap. Grg.* 507e. Dodds also quotes Sextus Empiricus (*Math.* 9.127) and Iamblichus (*VP* 237) as evidence that κοινωνία was a key Pythagorean term.

⁴¹ Huffman 2002: 268–69 and 2005: 210.

⁴² I refer to Diels–Kranz numeration, but the reader should consult Huffman's authoritative 2005 edition of Archytas' fragments.

the ideas of Archytas in a debate against the 'voluptuary' Polyarchus (A 9), in which Archytas may have said that the law-givers of old deified Temperance (Σωφροσύνη), Self-Control (Ἐγκράτεια) and Justice (Δίκη) and erected altars to them. Unfortunately, the content of that testimonium is in negative relief, since we are learning the voluptuary Polyarchus' arguments against Archytas' moral philosophy; in the absence of other direct testimony, Archytas' specific positive arguments for ethical moderation here remain undisclosed. Finally, and most importantly, the surviving fragments and testimonia of Archytas make no reference to *kosmos* at all; in fact, the only reference to Archytas' cosmology comes in a questionable testimonium from ps.-Plutarch's *On Music* (A 19 c), in which the author associates Archytas' cosmological theories of motion according to harmony not only with those of Pythagoras but also with those of Plato and 'the rest of the ancient philosophers'. This can hardly be accepted as reliable evidence for Archytas' cosmology.

Other natural scientists associated with early Pythagoreanism, such as Hippasus, Ecphantus and Alcmaeon, might recommend themselves as the referents for the 'wise men' in the account of Plato, but the scarcity of evidence makes it impossible to evaluate this proposition.⁴³ There is of course one exception, Philolaus of Croton (DK 44), who unquestionably uses '*kosmos*' to refer to contraries arranged in an order in a number of fragments.⁴⁴ Philolaus is familiar to most scholars as the absent teacher of Simmias and Cebes in Plato's *Phaedo*. In the fragments of Philolaus, we see something more similar to the κοινωνία between oppositional described by Socrates in the *Gorgias*. In Fragments B 1 and 6, this '*kosmos*' is forged from the fitting together of the oppositional principles, the limiters and unlimiteds, which are understood to come into relation with one another through the supervenience of

⁴³ Hippasus is associated by various later authors with cosmological theorisation (DK 18 Frs. 1, 11), but this association cannot be traced back any earlier than the Early Academy (cf. Horky 2013: Chapter 2). Hippon is said by Hippolytus (*Haer.* 1.16 = DK 38 B 3) to have believed that fire, subsequent to its being generated by water, 'subdued' (κατανικῆσαι) water's power and constituted the κόσμος. Alcmaeon of Croton theorised about the divinity of the 'whole of heaven' (in Aristotle's words (*De an.* 1.2.405b1 = DK 35 A 12): τὸν οὐρανὸν ὅλον), but there is no specific reference to *kosmos* anywhere else in his fragments or testimonia. Again, according to Hippolytus (*Haer.* 1.15 = DK 51 Fr. 1), the later Pythagorean Ecphantus posited that the *kosmos* is the 'shape' of the divine power (τὸν κόσμον εἶναι ἰδέον [θεῖος δυνάμεως]), which he referred to as 'mind and soul', and which generates spherical form. He was probably adapting Democritus' physics (e.g. DK 68 A 101 and 106). On Ecphantus, see Zhmud 2012: 107.

⁴⁴ The word *kosmos* occurs six times in the surviving fragments of Philolaus (twice in B 1, once in B 2, twice in B 6 and once in B 17). Finkelberg's rejection of the authenticity of Philolaus' fragments (1998: 128 n. 92) does nothing to address the specific arguments of Burkert or Huffman, whose claims he dismisses unreasonably.

harmony.⁴⁵ As Huffman has noted, *kosmos* in the fragments of Philolaus ranges in meaning from 'world' (B 1 and B 2), 'organised system' (B 1, B 2, and B 6) or simply 'order' (B 6), and to 'whole world' (B 17), if we accept B 17 fragment as authentic (and I have some doubts about this).⁴⁶ What is clearly missing in Philolaus' fragments, however, is the particular focus on the establishment of an actual *partnership* (κοινωνία) between the divine and the human aspects of the *kosmos*, which is explicit in Plato, and is implicit in the account of Xenophon.⁴⁷ Indeed, it is Socrates' extension of the notion of the *kosmos* to 'partnership' that is peculiar in Plato's account and warrants further analysis.

We will recall that Socrates raises the notion of the '*kosmos*' with Callicles in order to lay stress on the importance of the κοινωνία, a word that has significance not only for Plato's political philosophy, but also for his metaphysics.⁴⁸ The concept of 'community/communion' (κοινωνία) takes us back to Pythagoras and the Pythagoreans, once again. It is a key notion in Aristotle's criticisms of Pythagorean soul-body relationships in *On the Soul* (1.3.407b13-24 = DK 58 B 39), especially in their ill-expressed notion of how transmigration of the soul works.⁴⁹ Much later in the Pythagorean tradition, Iamblichus, who is probably deriving his

⁴⁵ I refer to Diels-Kranz numeration, but the reader should consult Huffman's 1993 edition of Philolaus' fragments. On the supervenience of harmony on the limiters and unlimiteds, see Horky 2013: 144-46.

⁴⁶ Huffman 1993: 97-98. As Huffman admits (1993: 215-19), several scholars (e.g. Mansfeld 1971: 62-63) have opted against authenticity for this fragment on various grounds, including the important fact that the diction is Ionic rather than Doric, and similarity to Plato's *Timaeus* (62c). I am doubtful that the two fragments preserved under the title *Bacchae* (B 17 and B 18, considered genuine by Huffman, and B 19, considered spurious by Huffman) are authentic.

⁴⁷ Xenophon claims that the 'professors' failed to understand the human aspects before rushing into discuss the divine ones in their inquiry into natural science. A similar charge is levelled against the Pythagoreans by Aristotle, whose focus on mathematical objects compels them to ignore empirical facts (*Metaph.* 1.5.985b23-986a21). See Horky 2013: 22-24. In B 6, Philolaus is clear about differentiating divine and human knowledge.

⁴⁸ A point often overlooked by some scholars who wish to see the 'political' as chief in Plato's mind here (e.g. Kerschensteiner 1962: 223-24 and Finkelberg 1998: 126 n. 87). The most explicit use of *koinein* and related words in metaphysics occurs in Plato's *Sophist*, when the Eleatic Stranger enumerates the 'greatest kinds' of the Forms (starting from 254b; also cf. *Pl. Soph.* 250b, 256b, 257a, etc.).

⁴⁹ Aristotle there says: 'A further absurdity occurs both in this argument and in the majority of arguments concerning the soul: for people attach the soul to a body and place it in a body, without specifying through what cause and how the body is so. And yet someone would think that this is necessary: for it is *through communion* (διὰ κοινωνίαν) that one acts and the other is acted upon, that one is moved and the other moves, but neither of these exists relative to the other in chance occurrences. But they only attempt to explain what sort of thing is the soul, whereas concerning the body that is to receive it, they do not specify anything further, as if it were to be possible, as in the Pythagorean myths, for any chance soul to be clothed in any chance body; for each [body] seems to have a peculiar form and shape.'

information from Nicomachus via Porphyry, describes the 'partnership' (μετοχή) that obtains between all living beings, with special reference to humans and non-human animals:

And he [sc. Pythagoras] ordered law-givers of communities to abstain from living beings; for since they wished to act completely in justice, it was necessary, surely, not to injure kindred animals, since how could they persuade others to behave justly if they themselves be caught in the pursuit of a greater share [ἐπεὶ πῶς ἂν ἔπεισαν δίκαια πράττειν τοὺς ἄλλους αὐτοὶ ἀλίσκόμενοι ἐν πλεονεξίᾳ]? The partnership among living beings is congenital [συγγενική ἢ τῶν ζῶων μετοχή], since, through the communion of life and the same elements and the mixture arising from these [διὰ τὴν τῆς ζωῆς καὶ τῶν στοιχείων τῶν αὐτῶν κοινωνίαν καὶ τῆς ἀπὸ τούτων συνισταμένης συγκράσεως], they are yoked together with us by brotherhood [ὥσανεὶ ἀδελφότητι], as it were. (Iamblichus, *On the Pythagorean Life* 108)

We see the elements of Socrates' speech in the *Gorgias* being adapted to a debate concerning doing injustice towards other animals, in particular, with regard to sacrificing and eating them. Humans are considered 'kindred' to other animals (τῶν συγγενῶν ζῶων), and it is this kinship that provides the justification for not doing them harm.⁵⁰ The 'congenital partnership' (συγγενική ἢ μετοχή) between all living beings, which arises out of the 'communion' (κοινωνία) of life and elements in the universal mixture (σύγκρασις), is elicited in order to show us that *pleonexia* is contrary to justice and just behaviour. The law-givers, if they are to act justly, must therefore abstain from eating other animals, which would constitute a type of *pleonexia* (a 'wanting beyond one's share'). We have seen above that Archytas explicitly criticises *pleonexia* and encourages unity within the polity by way of distribution according to what he calls 'calculation'; and it is possible that, in his debate with Polyarchus as preserved by Aristoxenus, he expressly discussed the positive benefits of the 'law-givers' to society, in particular, through deification of Temperance, Self-Control and Justice. But Archytas focused explicitly on the eradication of stasis within the polis, and among its constituents; there is no evidence that he was more broadly concerned with the 'cosmic' society that comprises, for example, divine and human, or living beings regardless of their status within the *scala naturae*.⁵¹ Moreover, there is no evidence of Archytas

⁵⁰ Compare Porph. *VP* 19, probably following Dicaearchus (Fr. 41a Mirhady).

⁵¹ This is all the more surprising, given Aristoxenus' explicit ascription to the Pythagoreans a definite axiological *scala naturae* in the *Pythagorean Precepts* (Frs. 33 and 34 Wehrli), with 'divine' (τὸ θεῖον) over and above all other things. See Horky 2013: 42–48.

recommending abstention from eating animals, or even of espousing theories of metempsychosis, as described by Aristotle. If Archytas was indeed a Pythagorean, and if he was developing his own philosophical approaches to the problems of equity and fairness, he seems not to have concerned himself with anything beyond the immediate political environment.⁵² Iamblichus' information concerning the Pythagorean 'congenital partnership' of animals is suggestive, but it cannot be considered definitive for our study of the early usages of *kosmos*: since it is impossible from a historiographical perspective to evaluate the material concerning Pythagoras' purported discussion of *κοινωνία*, we might wish to press more on Plato's playful reference to the 'wise men's' co-implication of '*kosmos*' and 'partnership' – but with Iamblichus' information as a possible heuristic tool.

If we return for a moment to the Scholiast's gloss on the 'wise men' of *Gorgias* 507e–508a, however, we will see that the Scholiast's source (Proclus?) refers to the 'wise' Pythagoreans, and then goes on to describe Empedocles, 'who declared that friendship unifies the sphere, and that it is the unifier [σοφούς ἐνταῦθα τοὺς Πυθαγορίους φησί, καὶ διαφερόντως τὸν Ἐμπεδοκλέα, φάσκοντα τὴν φιλίαν ἐνοῦν τὸν σφαῖρον, ἐνοποιὸν εἶναι]'. The Scholiast's source seems to focus on the 'friendship' attribute (φιλία) of the 'community/communion' that he found in the text of Plato, which might explain why he was reminded of Empedocles at all. But, I think, this cannot be the whole story. Here, we need to consider another important, but often understudied part, of the doxography, this time from Sextus Empiricus:

Well then, the followers of Pythagoras and Empedocles and the remaining lot of Italians declare not only that there is a community between us men and one another and with the gods, but also with the irrational animals [μὴ μόνον ἡμῖν πρὸς ἀλλήλους καὶ πρὸς τοὺς θεοὺς εἶναι τινα κοινωνίαν, ἀλλὰ καὶ πρὸς τὰ ἄλογα τῶν ζώων]. For, they say, there is one *pneuma* which pervades the entire *kosmos*, in the manner of a soul, which also unifies us with them. This is why if we kill them and feed on their flesh, we will be committing an injustice and acting impiously, on the grounds that we are destroying our kin. Hence, too, these philosophers recommended abstinence from animal food, and they declared impious those people who 'reddened the altar of the blessed ones with warm blood'. And Empedocles somewhere says:

Will you not desist from harsh-sounding bloodshed? Do you not see

⁵² In this way, his political thought would be best compared with that of Solon, on which see Carol Atack's contribution in this volume.

That you are devouring one another in the heedlessness of your understanding?⁵³ (Sextus Empiricus, *Against the Mathematicians* 9.127)

We can see three of the elements found in the arguments attributed by Socrates to the 'wise men' in the *Gorgias* in this passage: the 'community' of gods and men, the unity of the '*kosmos*', and justice; and we also see the elements of the account of Iamblichus, namely the argument for the abstinence from animal food as a consequence of the sharing of kinship with irrational animals, an argument associated with Pythagoras in some form as early as Eudoxus of Cnidus.⁵⁴ There is the intrusion, if we can call it that, of what looks to be the Stoic *pneuma* (πνεῦμα) here, as well (perhaps standing in for something like *aether*). Now, typically, scholars have speculated that Sextus' source for his information on Pythagoreanism was Posidonius.⁵⁵ I have my doubts about this, especially given our evidence that neither Chrysippus nor Posidonius believed that justice extended from humans to other animals, on the grounds that other animals simply did not share of rationality.⁵⁶ And it is clear that the source isn't Alexander Polyhistor either, since he underscores the importance of all living beings, including the sun and stars, as well as gods and men, sharing in 'heat' (τὸ θερμόν) as a modality of *aether*.⁵⁷

Still, the appearance of the extension of the πνεῦμα through all things looks Stoic, which would place the source of this testimony at the earliest in the late fourth century BCE, when Zeno of Citium apparently wrote a work on the Pythagoreans, of which nothing survives except a title (*Pythagorica*).⁵⁸ Indeed, the association of Pythagoreanism and '*kosmos*' in the terms discussed here points us to Zeno in particular. Zeno appears to have argued in the *Republic* that all individuals within the *kosmos* were unified under a common law (συννόμου νόμῳ κοινῷ),⁵⁹ and it is relatively common in the doxography to see that breath (πνεῦμα) is extended throughout all parts of the *kosmos* and holds

⁵³ DK 31 B 136.

⁵⁴ Eudoxus Fr. 325 Lasserre = Porph. *VP* 7. It is moreover one of the *acousmata*: 'abstain from animals' (Iambl. *Protr.* 21, p. 108.15 Pistelli).

⁵⁵ Generally, on this issue, see Brennan 2015. ⁵⁶ Cf. Posidonius Fr. 39 Kidd = Diog. Laert. 7.129.

⁵⁷ Diog. Laert. 8.26–28. Cf. Long 2013: 150–52, who also notes that Alexander's system of reproduction shares much with the account of Anonymous Londiniensis on Philolaus' embryology (DK 44 A 27). Note too that while Alexander Polyhistor does refer to a Pythagorean notion of human συγγένεια with the gods (Diog. Laert. 8.27), there is no discussion of non-human animals to be found there.

⁵⁸ *SVF* 1.41. I should note that the significance of 'breath' (πνεῦμα) to the Pythagorean cosmology is attested prior to Stoicism by Aristotle (*Phys.* 4.5.213b22–29; Fr. 201 Rose³ = DK 58 B 30). I discuss this extensively in Chapter 13.

⁵⁹ *SVF* 1.262.

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them in place through relationships of tension.⁶⁰ But Zeno did not appear to hold that 'kinship' or 'participation' unified all creatures within the *kosmos*: others criticised Zeno for arguing that only the virtuous, and not the inferior, could obtain real friendship and were truly akin to one another.⁶¹ Either Sextus preserves a Stoic doxographical record of the communal cosmology of the Pythagoreans and Empedocles that was dialectical – in which case it would be difficult to see what the Stoic source thought was *wrong* with the Pythagorean-Empedoclean account of the human-beast partnership⁶² – or we will need to reconsider the apparent Stoicism of the Pythagoreanism/Empedocleanism described in this passage of Sextus.

One solution to our puzzle about Sextus' passage, I suggest, arises if we take our cue from both the Scholiast and from Sextus, and from the somewhat surprising reference in Iamblichus' account to the 'mixture arising out of these elements' (τῶν στοιχείων ... τῆς ἀπὸ τούτων ... συγκράσεως), and focus our attention on Empedocles. It is clear, first of all, that Empedocles was considered a natural philosopher by Aristotle, and one who is to be credited with philosophical innovations (especially in developing a nuanced approach to the efficient cause and proposing four elements, rather than one).⁶³ In particular, Aristotle indicates the extent to which Empedocles was concerned with describing the constitution of the *kosmos*, even referring to a portion of his work as the 'making-of-the-*kosmos*' (κοσμοποιία).⁶⁴ But he was concerned with ethics and proper moral conduct as well. In fact, he is the earliest Greek we know of who unquestionably rejected the eating of flesh – the evidence for Pythagoras before him is inconsistent, at best.⁶⁵ Empedocles also dedicated a surprising amount of his poem to illustrating the consequences of the fact that all animals breathe, as several of his fragments attest⁶⁶, and moreover he associated the aether with a part of the soul.⁶⁷ He also claimed of the divine (possibly the godhead Apollo?) that it 'is only a sacred and ineffable thought organ / Darting through the entire *kosmos* with swift thoughts' (ἀλλὰ φρήν ἱερὴ καὶ

⁶⁰ See Long and Sedley 1987, vol. 1: 320–21. ⁶¹ Diog. Laert. 7.32–33; *SVF* 3.631.

⁶² For example, Cicero (*Rep.* 3.33) only understands law, as right reason, to be distributed throughout all peoples and cities rather than the entire *kosmos* (like the soul). He criticises those who adopt a notion of metempsychosis that would not see the transmigration of a rational soul into a beast as problematic (*Rep.* 4.1c).

⁶³ DK 31 A 22, A 37 and A 39. Cf. Kahn 2001: 18.

⁶⁴ Arist. *Phys.* 2.4.196a22–23 = DK 31 B 53. Aristotle also associates this with the activity of Mind in Anaxagoras (*Metaph.* 1.5.987a19).

⁶⁵ Cf. Burkert 1972: 180–82; Kahn 2001: 17–18; Riedweg 2005: 36–37. ⁶⁶ DK 31 B 100 and A 74.

⁶⁷ If Aristotle (*De an.* 1.2.404b8–15) has read him correctly (DK 31 B 109).

ἀθέσφατος ἔπλετο μοῦνον, / φροντίσι κόσμον ἅπαντα καταΐσσουσα
 θοησιν).⁶⁸ It is not hard to imagine the source of Sextus' passage attempting
 to Stoicize Empedocles' lines by assuming that he was actually referring to
 the *pneuma* when he spoke of the divine rational force in its modality as
 a thought organ (φρήν).⁶⁹ Moreover, Empedocles believed that the *kosmos*
 was unified, shaped like an egg,⁷⁰ and, most importantly, was constituted by
 friendship (φιλία), as we see in fragment B 26:

And, in turn, they dominate as the cycle rolls around,
 And they dwindle and grow into one another in the turn of fate,
 For these things are the same, and running through one another
They become men and the races of other beasts,
And at one time coming together by Love into one *kosmos*,
And at another time again each being borne apart by Strife's enmity,
Until, all of them grown together into one, the universe is subsumed.
 Thus insofar as they learned to grow as one from many,
 And they finish up many as the one again grows apart,
 In this respect they come to be and have no constant life;
 But insofar as they never cease from continually interchanging,
 In this respect they are always unchanged in a cycle.

ἐν δὲ μέρει κρατέουσι περιπλομένοιο κύκλοιο,
 καὶ φθίνει εἰς ἄλληλα καὶ αὖξεται ἐν μέρει αἴσης.
 αὐτὰ γὰρ ἔστιν ταῦτά, δι' ἀλλήλων δὲ θέοντα
γίγνοντ' ἄνθρωποι τε καὶ ἄλλων ἔθνεα θηρῶν,
ἄλλοτε μὲν φιλότῃτι συνερχόμεν' εἰς ἓνα κόσμον,
ἄλλοτε δ' αὖ δίχ' ἕκαστα φορούμενα νείκεος ἔχθει,
εἰσόκεν ἓν συμφύντα τὸ πᾶν ὑπένερθε γένηται.
 οὕτως ἢ μὲν ἐκ πλεόνων μεμάθηκε φύεσθαι,
 ἢ δὲ πάλιν διαφύντος ἐνὸς πλεον' ἐκτελέθουσι,
 τῇ μὲν γίγνονταί τε καὶ οὐ σφίσιν ἔμπεδος αἰών
 ἢ δὲ τὰδ' ἀλλάσσοντα διαμπερές οὐδαμὰ λήγει,
 ταύτῃ δ' αἰὲν ἔασιν ἀκίνητοι κατὰ κύκλον. (Empedocles, DK 31 B 26)

What exactly Empedocles' *kosmos* is, and perhaps more importantly when
 and how it comes into existence, remains a topic of debate among
 scholars.⁷¹ Yet there can be no doubt that when he mentions the *kosmos*,

⁶⁸ DK 31 B 134. On this passage, see Inwood 2002a: 68.

⁶⁹ Interestingly, this term is also used by Alexander Polyhistor in reference to the Pythagorean soul (Diog. Laert. 8.30).

⁷⁰ DK 31 A 50 and A 58.

⁷¹ Aëtius (1.5.2 = DK 31 A 47) says that Empedocles believed that there was only one *kosmos*, but the *kosmos* is not identical with the universe; rather, it is said to be a small part of the universe, while the rest is inert matter.

Empedocles is speaking of a 'world' made up of many diverse objects, and given order in accordance with the cycles of fate, which impose alternation upon them.⁷² And elsewhere (B 115), Empedocles is explicit not only in attributing a causal role to the 'oracle of necessity, ancient decrees of the gods, sealed with broad oaths' (ἀνάγκης χρῆμα, θεῶν ψήφισμα παλαιόν, / αἰδίδιον, πλατέεσι κατεσφρηγισμένον ὄρκοις) to growth, alteration and locomotion of the individual through the cycle of strife, but he also associates this process with the sins that accrue when one sacrifices improperly or swears false oaths.⁷³ Indeed, Plutarch's interesting description of the cycles of Strife and Love helps us to fill in the gaps left from an incomplete text of Empedocles' poem, and it also links Empedocles' cosmology to Plato's in the *Timaeus* by way of the critical importance of 'partnership' (κοινωνία). In mocking the Stoics' approach to cosmology, Plutarch elaborates a vision of the ἀκοσμία that obtains in Empedocles' cycle of Strife:

Earth had no share of warmth, nor water any share of breath; none of the heavy things was up nor any of the light things down; but the principles of the universe were unblended, unloving, solitary, not desiring combination or communion with one another [μὴ προσιέμεναι σύγκρισιν ἑτέρου πρὸς ἕτερον μηδὲ κοινωνίαν]; fleeing and not admitting of blending or communion with one another, turning away and executing their separate and self-willed movements, they were in the condition which Plato [*Ti.* 53a–b] attributed to everything from which god is absent, i.e. in the condition of bodies when deserted by mind and soul. They were in that condition until by providence desire came into their nature [ἄχρι οὗ τὸ ἰμπερτόν ἦκεν ἐπὶ τὴν φύσιν ἐκ προνοίας] because of the presence of love and Aphrodite and Eros, as Empedocles, Parmenides, and Hesiod say, so that [the elements] by changing places and sharing their powers amongst each other, some being bound by the necessities of movement, some of rest, [all] being forced to give in and move from their natural state towards the better, they might create the harmony and communion of the universe [ἁρμονίαν καὶ κοινωνίαν ἀπεργάσσηται τοῦ παντός]. (Plutarch, *Concerning the Face that Appears in the Orb of the Moon* 926e–927a; tr. after Inwood)

It is difficult, as always, to extract the genuine Presocratic substrate from the Middle Platonist dressings. Surely the appearance of providence is dialectical, and functions within the broader criticism of Stoic physics

⁷² For a description of how Empedoclean alternation works, see Horky 2013: 179–81.

⁷³ A similar notion is exhibited by the Hippocratic author of *On the Nature of Man*, a text probably composed in the latter half of the fifth century BCE, where we see (*Nat. Hom.* 7) that all the elemental powers of the universe exist with one another according to 'necessity'.

and ethics.⁷⁴ Be that as it may, it is clear that Empedoclean cosmology and Pythagorean κοινῶνία came to be so deeply intertwined that ancient historians of thought and doxographers found it difficult to separate the strands out; it may have been unnecessary, or even unfruitful, for them to do so. Empedocles' place within the history of Pythagoreanism was fixed sometime in the early Hellenistic period – in the writings of Neanthes of Cyzicus and Timaeus of Tauromenium, at the very latest (late fourth to mid third centuries BCE).⁷⁵ This is a *terminus ante quem*. But it is possible that such associations originated in the Socratic dialogues of Plato and Xenophon, through their typically elusive method of describing the positive contributions made to their own respective philosophies.

Now I would like to offer some concluding remarks. Our study has attempted to work backwards chronologically from the Hellenistic and Post-Hellenistic testimonies concerning the first discovery and usage of the term '*kosmos*' to refer to the 'world-order' to the Classical period, in order to sketch out a reception-history of the heurematographical tradition. Our analysis suggested that the most extensive account that makes Pythagoras the first person to refer to the heavens as the '*kosmos*', that of the sceptic philosopher and historian Favorinus of Arles, seems to represent the continuation of a tradition that associated Pythagoras with various discoveries and innovations in mathematics and cosmology in the mid fourth century BCE, both in the Academy and in the Lyceum. Consequently, we sought to examine whether sources prior to Aristotle, Aristoxenus and Theophrastus, as well as the Early Platonists, might also hint at similar associations. This led us to the puzzle of solving the identity of some anonymous 'professors' (οἱ σοφισταί) in Xenophon's *Memorabilia*, as well as some anonymous 'wise men' (οἱ σοφοί) in Plato's *Gorgias*, whose marked use of the term '*kosmos*' was associated with, respectively, natural science and its laws, and 'partnership' (κοινῶνία) between the various divine and mortal aspects of the universe. The likeliest candidates to identify with these figures were Pythagoreans, in particular, Archytas of Tarentum, whose focus on mathematical proportions, especially 'calculation' (λογισμός), as a means to eradicate stasis within the community, parallels Socrates' description of the 'geometrical equality' in the *Gorgias*;

⁷⁴ As noted by Cherniss in his Loeb translation. Plutarch's *Amatorius* (756d–f) provides some guidance: there, Plutarch describes a similar cosmogony by reference to Empedocles' B 17.20–21, Parmenides B 13, and Hesiod's *Theogony* line 120. According to Aëtius (2.3.3 = DK 51 F 4), another later 'Pythagorean', Ecphantus of Syracuse, believed that the *kosmos* was 'constituted out of atoms, and that it is overseen by providence'.

⁷⁵ See Horky 2013: 116–18 and Schorn 2014: 307–9.

Philolaus of Croton, whose marked use of '*kosmos*' and cosmological theory of the harmonisation of oppositional limiters and unlimiteds reflected the basic tenor of Plato's account, while also retaining Xenophon's concern with astronomy and the generation of the heavens; and Empedocles of Agrigento, who is directly associated with the 'wise men' of Plato's account by the Scholiast to Plato's *Gorgias*, and whose implication of the generation of the '*kosmos*' within the universe and the objects that constitute it through the influence of Love strikes closest to both accounts, while retaining the all-important association between 'partnership' and '*kosmos*' that distinguished Plato's version.

In the end, however, *none* of these figures can be directly paralleled with both the earliest dialectical accounts – that of Xenophon and that of Plato – of those clever people who used '*kosmos*' in a marked way to refer to the world-order. But this should not surprise us: neither Plato nor Xenophon wrote their dialogues primarily in order to entertain our curiosities about the history of philosophy; they sought to develop and promote their own philosophical agendas through their peculiar preservations of the memory of Socrates. No single piece of the evidence presented here can be considered the smoking gun that solves our question, 'when did '*kosmos*' become the *kosmos*?'; it is clear that the concept of '*kosmos*' came to mean 'world' or 'world-order' by, at the latest, the first few decades of the fifth century BCE.⁷⁶ But the evidence presented here does suggest that early Pythagoreans of the experimental sort, the 'exoterics' who were often considered 'outsiders' or 'scientific' Pythagoreans by later traditions, adopted the term *kosmos* and in order to explain the relationship that obtains between the recurrent modes of alteration and change within the observable universe and the balance that is meant to undergird systems of justice and fairness between the living participants of that universe. The indications from the later doxographical traditions, combined with the surviving fragments of the second- and third-generation 'Pythagoreans' themselves, all point in the same direction, back to the enigmatic and elusive Pythagoras of Samos. It's the usual problem with Pythagoras: no smoking gun, and all smoke and mirrors.

⁷⁶ Also see Malcolm Schofield's chapter (Chapter 3), where he argues that Heraclitus in DK 22 B 30 was attacking those who used κόσμος to refer to the 'world' or 'world-order'. I have raised some worries about which *specific* (τόνδε) κόσμος is being appealed to, however, in the Introduction.