

Phillip Sidney Horky*

***Prooimia* to Order: Pre-Cosmic Reality in Hesiod and Early Pythagoreanism**

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Abstract: This paper aims to provide a reflective understanding of what proems are, and what they can achieve, by advancing beyond the literary and agonistic elements of proems, often understood to reflect the social or cultural aspects of literary form. Instead, it seeks to expand the possibilities for understanding proems as distinct avenues for new ways of talking about the content of reality. It does so chiefly through analysis of two major cosmogonic works from Ancient Greece: Hesiod's *Theogony*, and the treatise *On Nature* by the Pythagorean philosopher Philolaus of Croton. This paper argues that both Hesiod and Philolaus designate the proems of their works as places to outline the primordium of reality, and that their cosmogonic accounts have much more in common than scholars have typically recognized. These 'biomorphic' accounts of the birth of the ordered universe stand especially in contrast to accounts based on other cosmogonic modes, such as the 'stochazomorphic' and 'technomorphic' modes (the latter of which is deployed in the proem to Ovid's *Metamorphoses*, which stands in contrast especially to Hesiod's account of the generation of reality).

Keywords: Hesiod, Pythagoras, Philolaus of Croton, Ovid, cosmology

When we speak of *prooimia* in Classical Greek literature,¹ we tend to think of programmatic introductions to lengthy works: in historiography, we might call to mind the first sentence of Herodotus' *Histories*, with its famous *sphragis*;² or the so-called

1 A version of this paper was presented at two conferences: 'HAPP One-Day Conference on *Order and Chaos*', Oxford University, June 2023; and 'Networking through Proems: Proemial Strategies for Intellectual Networking in Antiquity', KU Leuven Institute Lectio, September 2023. A transcript version of the former presentation, which has been modified and augmented here, has been published in *Journal of Physics: Conference Series* 2877 (2024). All translations from Greek or Latin are mine (unless otherwise specified).

2 Hdt. 1.1: Ἡροδότου Ἀλικαρνησσεὺς ἱστορίας ἀπόδεξις ἦδε, ὥς μῆτε τὰ γενόμενα ἐξ ἀνθρώπων τῷ χρόνῳ ἐξίτηλα γίνηται, μῆτε ἔργα μεγάλα τε καὶ θωमाστά, τὰ μὲν Ἕλλησι τὰ δὲ βαρβάροισι ἀποδεχθέντα, ἀκλεᾶ γένηται, τὰ τε ἄλλα καὶ δι' ἣν αἰτίην ἐπολέμησαν ἀλλήλοισι.

***Corresponding author: Phillip Horky**, Durham University, Durham, United Kingdom,
E-Mail: phillip.horky@durham.ac.uk

‘archaeology’ of Thucydides’ *History of the Peloponnesian War*;³ or, a century or so earlier than these works, the first line of Hecataeus’ *Genealogies*, which, no doubt, both Herodotus and Thucydides consulted when developing their own proems.⁴ In early Greek poetry, we might consider the beginning of Homer’s *Odyssey*, which identifies the main actor in the work (Odysseus); the major themes (the pain and suffering incurred through Odysseus’ πολυτροπία and his men’s ἀτασθαλία); the previous tradition it seeks to replace (indicated by what Homer will not discuss, namely, the Trojan War, and the men who escaped death after it, i.e., the contents of the *Iliad* and the other works of the Epic Cycle); and the divine force that motivates the narrative of the work (the god Poseidon).⁵ In philosophical prose, we might consider the beginning of Heraclitus’ book, with its stated concern to elucidate the Logos’s eternality and persistence across reality, as well as other mortal fools’ inability to comprehend it properly⁶ – here, no doubt, Heraclitus is referring to, among others, the wisdom practitioners that preceded him or were his immediate competition, including such advocates for πολυμαθία as Hesiod, Pythagoras, Xenophanes, and Hecataeus.⁷ *Prooimia* in early Classical Greek literature thus stand as introductions to a work that characterize, more or less directly, the author’s own method and style, and the major themes of the work, in the context of – again more or less directly – their predecessors or the anterior tradition.

The above description of the *prooimia*-trope in Archaic and Classical Greek Literature is not particularly novel or groundbreaking. In this sense, it makes little progress on our conventional or received notions of proems. This paper will pursue a more reflective understanding of what proems are, and what they can do; that is, it seeks to move beyond (without leaving aside) the literary and agonistic elements of proems, which are often understood to reflect the social or cultural aspects of literary form, to expand the possibilities for understanding proems as distinct avenues for new ways of talking about the content of *reality*. From this perspective, we might speak of a ‘metaphysical’ aspect of proems, one that is deeply invested in

3 Thuc. 1.1–23.

4 Hecataeus *FgrHist / BNJ* 1 F 1: ‘Ἐκαταῖος Μιλήσιος ὧδε μυθεῖται· τάδε γράφω, ὥς μοι δοκεῖ ἀληθῆα εἶναι· οἱ γὰρ Ἑλλήνων λόγοι πολλοί τε καὶ γελοῖοι, ὥς ἐμοὶ φαίνονται, εἰσίν.

5 Hom. *Od.* 1.1–22.

6 DK 22B1 = L&M 9 D1: τοῦ λόγου τοῦδ’ ἐόντος αἰεὶ ἀξύνετοι γίνονται ἄνθρωποι, καὶ πρόσθεν ἢ ἀκοῦσαι, καὶ ἀκούσαντες τὸ πρῶτον· γινομένων γὰρ πάντων κατὰ τὸν λόγον τόνδε ἀπείρουσιν εἰκόσιν, πειρώμενοι καὶ ἐπέων καὶ ἔργων τοιοῦτων, ὁκοίων ἐγὼ διηγέσθαι κατὰ φύσιν διαιρέων ἕκαστον καὶ φράζων ὅκως ἔχει. τοὺς δὲ ἄλλους ἀνθρώπους λανθάνει ὁκόσα ἐγερθέντες ποιοῦσιν, ὅκωσπερ ὁκόσα εὐδοντες ἐπιλανθάνονται.

7 DK 22B40 = L&M 9 D20: πολυμαθὴν νόον οὐ διδάσκει· Ἡσίοδον γὰρ ἂν ἐδίδαξε καὶ Πυθαγόρην αὐτίς τε Χενοφάνεά τε καὶ Ἐκαταῖον.

and reflective upon the primordial status of the proem in literature, i.e., the proem as ἀρχή of the work.

The case studies for the present investigation into, in a not wholly anachronistic sense, the causative potential of the proem in Classical Greek literature have been selected because of the way that they, paradigmatically among works of ancient literature, deploy the proem not only to introduce the work and its themes, as well as its status in relation to its genre, but also to maximize the significance of the proem as the first, most fundamental, and most authoritative description of reality as we know it. Not surprisingly, the texts investigated here are deeply concerned with explaining the formation of the world, i.e., with presenting a cosmology of reality that accounts for how the world came to be what it is. They are: Hesiod's *Theogony*, probably composed sometime in the late 8th or early 7th century BCE; and the Pythagorean Philolaus of Croton's *On Nature*, probably composed in the second half of the 5th century BCE. The conclusion of this paper will have something to say about Ovid's *Metamorphoses* (completed 8 CE) as well, although only in brief. In each case, so this paper will argue, the metaphysical aspect of the texts' proems emerges from careful consideration of the primordial entities out of which reality was created. It will also be important to take note of what kind of cosmogonic mode is inscribed in the proem to reality: this paper appeals to three modes of cosmogony: the 'biomorphic', 'stochazomorphic', and 'technomorphic'.⁸ By 'biomorphic' I mean modes of cosmogony based on, or analogous to, the processes of animal generation – especially the procreation of human beings (examples include Hesiod and the Pythagoreans, including Philolaus of Croton); by 'stochazomorphic' I mean modes of cosmogony whereby the creation of the universe is caused by randomness or chance (examples include Leucippus, Democritus, Epicurus, and Lucretius); and by 'technomorphic', I mean cosmogonic modes whereby the activity of cosmic creation is referred to a craftsman or artisan god, who 'makes' or 'shapes' the cosmos rationally (examples include the book of Genesis, Plato, and Ovid). This paper will chiefly deal with the first and third modes, i.e., the 'biomorphic' and the 'technomorphic'.

Hesiod's *Theogony*, written in Greek epic hexameters, is a kind of narrative catalogue of the many generations of the gods, with an explicit focus on the story of how the Olympian gods, and notably their patriarch Zeus, rose to power over the previous ruling generation, the Titans.⁹ Before turning to the treatment of Chaos in

⁸ The terms 'biomorphic' and 'technomorphic' are derived from Burkert 1999, 94–95. I introduce the notion of 'stochazomorphic'.

⁹ The genre of the theogony, i.e., the account of the birth of the gods, their distinct generations, and their wars, was already well established in Babylonian, Egyptian, and Hittite cultures. Hence, Hesiod's *Theogony* represents a late comer in the history of theogonic narratives in the West. This means that it appears at a stage where, at least hypothetically, the proem is already a well-es-

this poem, it may be valuable to summarize its contents briefly. Hesiod's *Theogony* starts with a divine invocation to the Muses – who know both the truth of reality, and how to lie about it – to aid Hesiod in the telling of the story of the rise of the Olympians.¹⁰ It turns to the genealogy of the gods, starting for the first four entities to appear in reality: Chaos, Earth, Tartarus, and Eros, who were generated *ex nihilo*.¹¹ This is what I am referring to as the proem of the work: it occurs after the divine invocation to the Muses (which is styled as a hymn) and before the actual orderly generation of reality by means of sexual intercourse among the gods.¹² The *Theogony* proceeds from the proem's display of the primordial gods to trace the two families that descend from the first parents¹³: the family of Chaos, which is itself first-born; and the family of Gaia or Earth, whose children include Ouranos or Heaven, with whom Gaia 'mixes' in order to produce the next generation, the Titans (the patriarch of which is Kronos). Among the first generation of gods, Tartarus has only one child, Typhoeus, and Eros has no children. The grandchildren of Gaia, and children of Kronos, are the Olympians (the patriarch of whom is Zeus). Hesiod's divine genealogy is interrupted by two succession myths: first, the overthrowing of Heaven by Kronos, in which Heaven, who hated his own children, hid them in a dark hole in Earth (effectively her uterus), until Earth crafted a plan whereby her son Kronos would wait until his father Heaven lay upon her, and he would cut off his father's genitals with a sickle from the inside, thereby usurping his father's rule.¹⁴ The second succession myth is similar:¹⁵ Kronos, patriarch of the Titans, learns in an oracle from his grandmother Earth and (usurped) grandfather Heaven that his own son is fated to overthrow him. Seeking not to replicate his father's mistakes, Kronos swallows his own children, in the hopes that, so imprisoned inside himself, they will be prevented from overthrowing him. But Rhea, Kronos' consort and mother to the Olympian gods, decides to trick Kronos and wraps a stone in swaddling clothes, which Kronos unthinkingly eats. For his own

established convention of the theogonic narrative, and that while, from the perspective of a traditional Classicist, Hesiod's *Theogony* is paradigmatic for later figures in antiquity (as it surely was), this work also represents the continuation of a millennia-long poetic tradition that attempted to explain reality through divine genealogy. For helpful analyses, see Burkert 2004, 49–70, and more recently, Santamaría 2021.

¹⁰ Hes. *Theog.* 1–115.

¹¹ Hes. *Theog.* 116–128.

¹² There is an open question about whether we include the hymn to the muses in the proem, or whether it is differentiated; I would argue that the phrase ἐξ ἀρχῆς in line 115 marks a break from the previous hymn.

¹³ Hes. *Theog.* 129–1022.

¹⁴ Hes. *Theog.* 154–210.

¹⁵ Hes. *Theog.* 453–735.

part, Kronos' son Zeus is hidden in a cave in Earth (this time for protection) and eventually grows enough to challenge his father Kronos. Zeus calls upon his great uncles – the Cyclopes and Hundred-Handers – whom he frees from their chains (it is unknown whether Heaven or Kronos had originally imprisoned them). As a gift for their liberation, the Cyclopes bestow upon Zeus the gifts of thunder and lightning. Supported by these figures, Zeus wages war on his father Kronos and the family of Titans, defeating them through the use of lightning and imprisoning them in the furthest depths of the Earth, Tartarus. This section of the poem, traditionally referred to as the Titanomachy, is the most cosmological: it explains that the distance between Heaven and Earth is the same as that covered by a bronze anvil falling for nine days and nine nights, and finally arriving on the tenth day. Equally, the distance between Earth and the lowest levels of Tartarus, the edge of the underworld, is the same. Assuming no air resistance, that would mean the entire Hesiodic cosmos – from Heaven, through Earth, and down to Tartarus – would be roughly 7.3 trillion metres. The poem concludes with Zeus defeating another pretender to the throne, Typhoeus, only son of Tartarus, and a list of the goddesses he bedded, as well as a genealogy of his own children.

From the summary of its contents, it is evident that Hesiod's *Theogony* is a prime example of a *biomorphic* cosmogony, i.e., a narrative of the generation of the ordered universe paralleled to or based on the model of human procreation; in this sense, it does not substantially differ from its Near Eastern precedents. Now, as mentioned previously, the first-born of the gods is Chaos. This is emphatically stated at the beginning of the poem, after Hesiod's long invocation of and hymn to the Muses:

ταῦτά μοι ἔσπετε Μοῦσαι Ὀλύμπια δώματ' ἔχουσαι ἐξ ἀρχῆς, καὶ εἶπαθ' ὅτι πρῶτον γένετ' αὐτῶν.	115
Ἦτοι μὲν πρῶτιστα Χάος γένετ'· αὐτὰρ ἔπειτα Γαῖ' εὐρύστερνος, πάντων ἕδος ἀσφαλὲς αἰεὶ ἀθανάτων οἳ ἔχουσι κάρη νιφόεντος Ὀλύμπου, Τάρταρά τ' ἡρόεντα μυχῶ χθονὸς εὐρυοδείης, ἡδ' Ἔρος, ὃς κάλλιστος ἐν ἀθανάτοισι θεοῖσι, λυσιμελής, πάντων τε θεῶν πάντων τ' ἀνθρώπων δάμναται ἐν στήθεσσι νόον καὶ ἐπίφρονα βουλήν. Ἐκ Χάος δ' Ἐρεβός τε μέλαινά τε Νὺξ ἐγένοντο· Νυκτὸς δ' αὖτ' Αἰθήρ τε καὶ Ἥμερῃ ἐξεγένοντο, οὓς τέκε κυσαμένη Ἐρέβει φιλότῃ μιγείσα.	120
Γαῖα δέ τοι πρῶτον μὲν ἐγένεατο ἴσον ἑωυτῇ Οὐρανὸν ἀστερόενθ', ἵνα μιν περὶ πάσαν ἔργοι, ¹⁶ ὄφρ' εἴη μακάρεσσι θεοῖς ἕδος ἀσφαλὲς αἰεὶ. (Hesiod, <i>Theog.</i> 114–28)	125

16 Or: καλύπτοι, i.e., 'to cover her over'.

Tell me them, Muses, you who hold Olympian abodes,
 From the beginning, and say which of them first came to be. 115
 Now it was Chaos that arose the very first, and thereafter
 Earth, broad-chested, steadfast eternal seat of all
 Immortals who hold the peaks of snowy Olympus,
 And dim Tartarus, in a nook of the wide-pathed ground,
 And Eros, who is fairest among the gods immortal, 120
 Loosener-of-limbs, who subdues the mind and sensible thought
 In the breasts of all the gods, of all men.
 From Chaos were born Erebus and black Night;
 And from Night came Aether and Day,
 Whom she [sc. Night] conceived and bore, fused in love with Erebus. 125
 But – look now! – Earth first bore a child, equal to herself,
 Starry Heaven, to enclose her from all sides,
 That she might be steadfast eternal seat for the blessed gods.

Hesiod's account of the beginnings of the world is remarkable both for what it says, and for what it does not say. It is exceptionally efficient, and Hesiod wastes no words. First of all, Chaos, whom Hesiod invents (this force is nowhere else attested in early Greek poetry), is the most primordial of the gods (it is described only with the term *πρώτιστα*). Chaos' name is neuter, which suggests no sexual differentiation, and for this reason this paper will refer to Chaos with the pronoun 'it'. The second god born is Gaia or Earth (her generation is only described with the term *ἔπειτα*, with no actual verb stated), although Hesiod implies that she was not born from first-born Chaos; for Chaos' progeny are clearly listed as Erebus (thick darkness) and Night, and his grandchildren (via Erebus and Night's copulation) are Aether (clear and distinct brightness) and Day. Moreover, the family of Chaos will never in the course of the *Theogony* mix with the family of Earth: they are kept totally separate throughout. This is pretty much all we hear in this passage about Chaos: that it was first-born, and that it has some children and grandchildren. Crucially, there are no epithets or adjectives applied to Chaos: to speak in Aristotelian terms, nothing else is predicated of Chaos (even the action of generating Erebus and Night is not, grammatically speaking, attributed to Chaos: line 123 simply says that they were generated from Chaos (*ἐκ Χάος*), and not that it *actively* gave birth to them). Hence, in this brief (but salient) introduction, Chaos is effectively without any properties.¹⁷ Even so, we are prompted to note the parallels between the pregnant phrase *ἐξ*

17 Cf. Santamaría 2021, 120–121. But he goes on to say that, '[o]f Chaos, Erebus and Night are born, two gods who represent a spatial (deep down) and a temporal concentration of darkness, respectively (123). We can easily deduce that it is a feature inherited from their father, as well as their absence of clear shape (123)'. This paper will argue that Chaos is not as such dark, but rather a primordial force of opposition, in which opposites (such as light and dark) both inhere.

ἀρχή in line 115 and the phrase ἐκ Χάος in line 123, placed at the same position at the beginning of their respective lines: there seems to be an equivocation here, as Chaos literally is the ἀρχή from which everything, including Hesiod's own genealogy of the gods, descends.

Hesiod's silence on Chaos' attributes prompts the question, which has plagued interpreters since antiquity: what, exactly, is Chaos?¹⁸ We can to some extent infer what Chaos is, I suggest, by determining what it *isn't*. For starters, it is not its siblings. In the first place, Chaos is not Earth. What is Earth? As Jenny Strauss Clay notes, Earth's primary quality is stated proleptically by Hesiod: she is the seat of the gods – or rather, she *becomes* the seat of the gods by giving birth parthenogenetically to Heaven, who, equal to her, gave her boundaries on all sides, thereby rendering her a *determinate surface space* that could be occupied.¹⁹ Since Earth plays the role of the ground where the gods would place their homes, Chaos would appear not to be this. Moreover, Chaos is not its third-born brother Tartarus. Not much is said about Tartarus here: we only hear that he is misty or dim (ἡερόεντα), and that he occupies a 'nook' (μυχῶ) in the ground – presumably a gap in the Earth.²⁰ As mentioned previously in the summary of the *Theogony's* contents, Tartarus is eventually revealed to be the furthest limit of the Hesiodic cosmos, a place of ultimate darkness where the Titans will be imprisoned and suffer punishment. So, if it is to be distinct from its sibling, Chaos cannot be (at least *ab initio*) a dark entity. Finally, Chaos is not Eros, the most beautiful of the immortals, who also produces no heirs, but is the force or power of desire for consummation. It is clear from this brief introduction that Hesiod understands Earth, Tartarus, and Eros to influence one another: Tartarus finds his place in a nook on or under the Earth, and Eros stimulates Earth to mate with her son Heaven, which leads to the establishment of boundaries around her surface.

Given the fact that comparison with its siblings merely reinforces Chaos' distinctiveness, we might consider how its children might help to determine its qualities. This is the approach taken by David Sedley, in an important article, where he contends, against the consensus view, that Chaos is a force of disorder and the source of evil in Hesiod's universe.²¹ Sedley's approach, which tracks the genetic inheritance of attributes, seems valid, and it pushes the biomorphic model to its

18 Cf. Bremmer 2008, 7: 'The parent of them is all is Chaos, literally 'Chasm', in fact, a kind of Black Hole (814), even though it is not that easy to understand what Hesiod really meant by it. Epicurus even turned to philosophy because his schoolmaster could not explain to him its meaning in the *Theogony* (Diog. Laert. 10.2)'.

19 Strauss Clay 2003, 15–16.

20 This paper will return to these crucial descriptors of Tartarus later on.

21 Sedley 2009.

limit: it assumes that the properties or attributes of the divine children are already genetically present (at least potentially) in their parent or parents. Since Chaos has no parent, we cannot determine its properties by examining its mother or father; so we will have to examine its children, as well as its further descendants.

As mentioned previously, Hesiod claims that Erebus, or thick darkness, and black Night, were generated ‘from’ or ‘out of’ Chaos (ἐκ Χάεος).²² In turn, Erebus copulates with Night in order to produce their opposites, Aether (or vivid brightness) and Day.²³ It is clear, then, that what eventually emerges from Chaos after multiple generations is both the opposites Night (its daughter) and Day (its granddaughter), and their opposing properties, obscure darkness (its son) and crisp brightness (its other granddaughter). From this perspective, we might suspect that Chaos just is *the primordial force of opposition*: on this thought, inherent in Chaos are the opposing parts of a 24-hour diurnal period (Day and Night), and the core properties that indicate or point to their opposition (light and dark). The regular circularity of diurnal time is emphasized later on in the *Theogony*:

τῶν πρόσθ' Ἰαπετοῖο πάϊς ἔχει οὐρανὸν εὐρὺν
 ἐστηῶς κεφαλῇ τε καὶ ἀκαμάτησι χέρεσσιν
 ἄστεμφέως, ὅθι Νύξ τε καὶ Ἡμέρη ἄσσον ἰοῦσαι
 ἀλλήλας προσέειπον ἀμειβόμεναι μέγαν οὐδὸν
 χάλκεον· ἡ μὲν ἔσω καταβήσεται, ἡ δὲ θύραζε 750
 ἔρχεται, οὐδέ ποτ' ἀμφοτέρας δόμος ἐντὸς ἐέργει,
 ἀλλ' αἰεὶ ἐτέρη γε δόμων ἔκτοσθεν ἐοῦσα
 γαῖαν ἐπιστρέφεται, ἡ δ' αὖ δόμου ἐντὸς ἐοῦσα
 μίμνει τὴν αὐτῆς ὥρην ὁδοῦ, ἔστ' ἂν ἵκηται·
 ἡ μὲν ἐπιχθονίοισι φάος πολυδερκὲς ἔχουσα, 755
 ἡ δ' Ὕπνον μετὰ χερσὶ, κασίγνητον Θανάτοιο,
 Νύξ ὅλοή, νεφέλη κεκαλυμμένη ἡεροειδεῖ. (Hes. *Theog.* 746–57)

To the front of these, the son of Iapetus holds the broad heavens
 Unmoved, using his head and his tireless hands,
 Standing, where Night and Day pass nearby
 One another and greet, as they exchange the great threshold
 Of bronze. One is about to go in the door, while the other 750
 Proceeds out, and the house never encloses both inside,
 But always the one, being outside the house
 Circles round the earth, while the other, in turn, being inside
 Waits for the hour of her own journey, ‘till it arrives.
 The one holds much-seeing light for creatures of the earth, 755
 The other [holds] in her hands Sleep, brother of Death
 – Night noxious, veiled in murky cloud.

²² Hes. *Theog.* 123.

²³ Hes. *Theog.* 123–125.

Hesiod's welcoming metaphor of the circuits of Day and Night highlights the balance that obtains through their motions along the ecliptic.²⁴ Moreover, Day and Night are denied co-presence: they cannot be in the 'house' of Heaven perpetually held aloft by Atlas at the same time, but they kindly wish one another well, upon arrival and departure. Hence, it is possible to think, with David Sedley (who emphasises the inbred nature of Chaos' family line), that Chaos is ultimately responsible for the generation of time – and even, as Sedley says, of the spatio-temporal dimension.²⁵ Moreover, according to Sedley, all the attributes of the other children of Night – as enumerated elsewhere in the poem, they are hateful Doom, black Fate, Death, Blame, painful Woe, the Lots, the Fates, Nemesis, Deceit, Old Age, and Strife – as well as the attributes of the children of Strife – Toil, Forgetfulness, Hunger, Grievs, Murders, Battles, Slaughters, Homicides, Discords, Lies, Disputes, Lawlessness, and Ruin – indicate that, for Hesiod, Chaos is the ultimate 'source of evil'.²⁶ But I think that Sedley's interpretation strains the metaphor of the biomorphic mode of cosmogony, and the attendant notion of genetic inheritance of properties. Let me explain why.

It is clear that Hesiod understands Chaos to be capable of producing two entities all by itself: Erebus (or darkness), and Night. It produces the brother and sister parthenogenetically, like Earth, who herself produces Heaven parthenogenetically. It is also implied in both the cases of Chaos and Earth that primordial parthenogenesis requires no force of desire. Rather, it is *only* after Earth has produced Heaven parthenogenetically that her brother Eros, or desire, exercises his power over her, so that she commingles with her son Heaven to produce the next generation. Chaos does no such thing: it never copulates with another, and hence the implication is that Chaos is never subjected to its brother Eros' power. Rather, it is Chaos' children Erebus and Night who find themselves compelled to copulate, and Hesiod is emphatic about this – he speaks of Night being 'fused in love' or 'blended through desire' (φιλότητι μυγεῖσθαι) with Erebus.²⁷ Hence, it is clear that, in the family line of Chaos, its daughter Night is the first to be subjected to the power of Eros, which is, as we saw with Earth, the central driver of second-order generation of beings (i.e., after parthenogenesis). This raises an important question: is it possible that Tartarus, the forgotten other sibling from among the first generation of gods, plays some role in the generation of the forces of discord?²⁸

²⁴ For the interweaving of cosmic theme and structure in Hesiod's ring compositions, see Strauss Clay 2021, 26–29.

²⁵ Sedley 2009, 246–248.

²⁶ Sedley 2009, 253–255.

²⁷ Hes. *Theog.* 125.

²⁸ For a range of positions on this issue, see Santamaría 2021, 120 n. 10.

A careful reading of these passages that tracks the attributes passed down suggests just this. For, if we examine the section describing the relationship between the mother Day and the daughter Night, we see not only that Night has been influenced by Eros (as mentioned previously) to give birth to her opposite, Day, but also that she features the properties of Tartarus as well. Recall that Tartarus was first described in the poem as ‘dim’ (ἡερόεντα) and ‘in a nook of the wide-pathed ground’ (μυχῷ χθονὸς εὐρυοδείης).²⁹ Tartarus would seem to be representative of the murkiness or dimness that obtains in places where there is no differentiation, such as the dark abodes at the end of the world, where the Titans eventually find themselves imprisoned in the poem. How does this relate to Night? Night is said to be ‘noxious, veiled in murky cloud’ (όλοή, νεφέλη κεκαλυμμένη ἡεροειδεῖ).³⁰ On Sedley’s reading, these qualities would somehow be owed to *Chaos*, on the grounds that Night was produced parthenogenetically from Chaos and could only have received them from her parent; but they are clearly meant to elicit comparisons with her uncle, *Tartarus* (note the comparison between Night being enshrouded in a cloud that is ἡεροειδεῖ, and Tartarus’ primary attribute as ἡερόεντα). Hence, it is by virtue of the force that Tartarus exerted over Chaos that Night and Erebus were generated from it. Consequently, the fact that Night, and her descendants, are creatures of darkness, and eventually of conflict and destruction, is not owed to her generation from Chaos – which, as noted before, is without qualities – but rather to Tartarus’ influence over Chaos.³¹

It might seem that this paper’s hypothesis is a stretch, especially since Sedley’s argument is so elegant and fits so neatly into a progressive and developmental history of thought (that concludes with Plato’s *Timaeus*). But this paper’s hypothesis helps to explain something that remains wanting, with regards to our analysis of the first passage of Hesiod’s *Theogony*. For, as noted briefly above, Tartarus is presented in the first instance not only as ‘dim’ (ἡερόεντα), but also as ‘in a nook of the wide-pathed ground’ (μυχῷ χθονὸς εὐρυοδείης).³² We previously argued that the wide-pathed ground is to be identified cosmically with Earth – but what of that curious ‘nook’ (μυχῷ)?³³ I would contend that this nook *precisely* is Tartarus’

²⁹ Hes. *Theog.* 119.

³⁰ Hes. *Theog.* 757.

³¹ What is the nature of this ‘influence’? This is more difficult to determine. One possibility, which we may adapt from West’s commentary (1966, 195), is the early association of τάραπος with παράσσω (‘trouble’, ‘disturb’), including the ‘troubled sea’ (cf. Hom. *Od.* 5.291 and 304). On this interpretation, Tartarus would be (as I will suggest below) the cloudy water element that fills the empty ‘nook’ that is Chaos – thereby making it obscure.

³² Hes. *Theog.* 119.

³³ The term μυχός retained its cosmogonic significance, as is attested by the presence of such ‘nooks’ in Pherecydes of Syros’ (6th century BCE) prose cosmogony (the title of which was probably

sibling, Chaos: on this reading, Chaos emerges from the highly economical description of Tartarus as the *interval between determinate spaces* (in this case, the spaces of earth as made determinate externally by Heaven). It must be noted that this interpretation confirms the conventional etymology of Chaos: scholars have sometimes assumed that the name Chaos, which Hesiod invented, is closely related to the term χάσμα or ‘chasm’.³⁴ This has been controversial, although the same could be said of alternative etymologies from antiquity.³⁵ The interpretation of Chaos as ‘chasm’, or interval between determinate spaces, however, receives support in another key passage of Hesiod’s *Theogony*, where the poet vividly reports the end of the Titanomachy:

Οὐδ’ ἄρ’ ἔτι Ζεὺς ἴσχεν ἔδν μένος, ἀλλά νυ τοῦ γε
 εἶθαρ μὲν μένεος πλῆντο φρένες, ἐκ δέ τε πᾶσαν
 φαῖνε βίην· ἄμυδις δ’ ἄρ’ ἀπ’ οὐρανοῦ ἡδ’ ἀπ’ Ὀλύμπου
 ἀστράπτων ἔστειχε συνωχадόν, οἱ δὲ κεραυνοὶ 690
 ἱκταρ ἅμα βροντῇ τε καὶ ἀστεροπῇ ποτέοντο
 χειρὸς ἀπο στιβαρῆς, ἱερὴν φλόγα εἰλυφόντες
 ταρφέες. ἀμφὶ δὲ γαῖα φερέσβιος ἐσμαράγιζε
 καιομένη, λάκε δ’ ἀμφὶ πυρὶ μεγάλ’ ἄσπετος ὕλη·
 ἔξεε δὲ χθὼν πᾶσα καὶ Ὠκεανοῖο ῥέεθρα 695
 πόντος τ’ ἀτρύγετος· τοὺς δ’ ἄμφεπε θερμὸς αὐτμῆ
 Τιτῆνας χθονίους, φλόξ δ’ ἡέρα δῖαν ἵκανεν
 ἄσπετος, ὅσσε δ’ ἄμερδε καὶ ἰφθίμων περ ἐόντων
 αὐγὴ μαρμαίρουσα κεραυνοῦ τε στεροπῆς τε.
 καῦμα δὲ θεσπέσιον κάτεχεν Χάος· εἷσατο δ’ ἄντα 700
 ὀφθαλμοῖσιν ἰδεῖν ἡδ’ οὐασὶ ὅσσαν ἀκοῦσαι
 αὐτῶς ὥς ὅτε Γαῖα καὶ Οὐρανὸς εὐρύς ὑπερθεν
 πύλατο· τοῖος γάρ κε μέγας ὑπὸ δοῦπος ὀρώρει
 τῆς μὲν ἐρειπομένης, τοῦ δ’ ὑψόθεν ἐξεριπόντος. (Hes. *Theog.* 687–704)

No longer would Zeus restrain his ferocity, but now his
 Heart was filled at once with ferocity, and he showed forth
 All his power: from Heaven, from Olympus together
 He advanced intrepid, hurling down lightning, and the bolts 690

‘Five-nook’, πεντέμυχος, or something similar). It was thought that the five-nook housed the next generation of gods after Chronos. See DK 7A2, A8, and B6 = L&M 4 D1, D6+R23, and D14. Pherecydes referred to water as Chaos (DK7B1a = L&M 4 D7), suggesting that, in his cosmogony, Chaos was not first-born. It is furthermore attested by Achilles Tatius that water was called Chaos (Χάος) due to the fact that it ‘flows out’ (χεῖσθαι) – certainly in reference to Hesiod, but possibly in reference to Pherecydes as well (DK 7B1a = L&M 4 R22).

34 Cf. West 1966, 192–193.

35 Greek Χάος, invented by Hesiod, is likely to be related to the word χάσμα (‘chasm’), from the verb χάσκειν (‘to gape’, ‘to yawn’). For a good discussion of the etymology of Χάος, see Mondy 1989.

Zigzagged thick with thunder and lightning alike
 From his stout hand, whirling the holy flame
 Recurrent. All around life-giving Earth trembled
 In flames – all around the vast forests rattled unspeakably in fire;
 Every ground, the streams of Oceanus, and the barren sea 695
 Were boiling; the hot blast enshrouded
 The chthonic Titans, the flame touched the heavenly air
 Unspeakably; though they be strong, the blazing shaft
 Of thunder and lightning-bolt shocked them blind.
 The awful sweltering seized Chaos – and it seemed, 700
 For eyes to see and for ears to hear,
 Just as if Earth and wide Heaven on high
 Collapsed; for so massive a din would arise
 From the former crashed upon, the latter crashing down.

Hesiod's account of the din of war is emphatic and pronounced: he seeks to convey the brutality of battle in the violence of sound. We are witness to nothing less than the perceived capitulation of the cosmos itself. Zeus advances upon the lower world like an army marching forth without pause; his lightning shatters the ears and blinds the eyes of the Titans. Its power is so diffuse, it would seem to anyone observing that it were bringing Heaven to collapse upon Earth. The mechanism for this wrecking of cosmic order is explicit: the heat produced by Zeus' lightning bolts grips Chaos, and without the gap to maintain distance between Heaven and Earth, there can be no order in the world. Hesiod does not of course allow for such a collapse of the world-order: it is presented counter-factually – as a thought experiment – mainly because the total destruction of the world-order would leave nowhere for the gods of Olympus to take their seat. But this does not invalidate the point, within the internal logic of the poem, that Chaos is figured as a gap or interval between determinate spaces on earth. Insofar as Chaos is a gap or interval, there is no reason to see in it a force of disorder. Rather, qua interval between limited or determinate spaces, Chaos is actually a *maintainer* of the world-order, without which internal cosmic order and differentiated space could not persist.

The second part of this paper turns to the Pythagorean Philolaus of Croton's imaginative cosmology, in order to investigate an alternative proemial account that determines, from the *primordium*, the principles of existence. It begins with a discussion of the emergence of a distinct concept of *kosmos* (κόσμος) or 'world-order' in the Pythagorean tradition, before turning to the gradual elaboration of this notion in the 5th century BCE. It is important to highlight at this point that, as far as our evidence suggests, the word '*kosmos*' did not always mean 'world-order'. A semantic analysis of the use of the term *kosmos* and its correlate verbal and adjectival forms in Archaic Greek literature reveals that, prior to 550 BCE, the term never means 'world-order', in the sense of a universal system of reality. Rather, it

just means ‘order’ in a more mundane and practical sense: in the Archaic Greece of Homer and Hesiod, *kosmos* refers to the good arrangement of a martial line, a properly sorted herd of cattle, a fine display of armour (on oneself or one’s horse), a nicely prepared dinner, or a beautiful arrangement of poetic song.³⁶ Importantly, the term never means ‘world-order’ in Homer, or in Hesiod, and in this sense, it is a bit misleading to speak, as I have previously, of Hesiod’s ‘cosmos’. Instead, Hesiod uses the term *πάς*, an adjective which just means ‘all’, as it does in line 127 of the *Theogony*, where Hesiod speaks of Heaven fencing in ‘all’ of earth (περὶ πᾶσαν ἔργου). By the time of the late 6th century BCE, the term *πάς* or ‘all’ had been abstracted to a more general notion, ‘the universe’, expressed with the neuter singular substantive τὸ πᾶν. In cosmological contexts, *kosmos* was not the preferred term, as τὸ πᾶν, or ‘the universe’, was the go-to metaphor. The Greeks themselves recognized this fact, and from as early as Plato and Xenophon (writing in the first half of the 4th century BCE), there began a collective speculation, which eventually morphed into a debate, about who was the first to refer to the universe, τὸ πᾶν, and everything in it, with the term *kosmos*.³⁷ Several figures were considered, but a consensus emerged that the first person to refer to the ordered universe as *kosmos* was Pythagoras of Samos (ca. 570 BCE – ca. 490 BCE).

Pythagoras was a philosopher – some in antiquity say he was the first philosopher, i.e., the person who first called himself a ‘*philosophos*’, someone who pursues wisdom, rather than a ‘*sophos*’, a wise man – who developed a school of learning in Croton, Southern Italy, around 530 BCE. Pythagoras is a highly controversial figure from an historical point of view, and there is no consensus on the intellectual activities he undertook, but most scholars would agree that Pythagoras engaged (in some way) in both scientific and moral education. The debate concerning who first used the term ‘*kosmos*’ to refer to world-order is evidenced by the sceptic philosopher Favorinus of Arles (late 1st – early 2nd century CE), who mentions in a work entitled *History of All Sorts*, 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 Zeno, it was Hesiod. (Favorinus F 99 Amato = Diog. Laert. 8.48)

Now at first glance Favorinus’ account seems quite straightforward, but there are some important implications to how he phrases his comment: he tells us that Pythagoras was first to refer to the heavens as *kosmos*, but the separate reference to earth

³⁶ Generally, see Horky 2019.

³⁷ Cf. Horky 2019, 27–31.

as ‘round’ would imply that he does not understand earth to be part of *kosmos* – and hence, *kosmos* refers in a restricted sense to heaven, not to the entirety of reality. This understanding of *kosmos* is confirmed by another late source, probably from the 1st century CE, whom scholars call ‘Anonymus Photii’ (since we do not know who the author was, but his text is preserved by the 9th century CE patriarch Photius of Constantinople). In the course of providing a comprehensive account of Pythagorean philosophy, Anonymus Photii says in passing:

πρῶτος Πυθαγόρας τὸν οὐρανὸν κόσμον προσηγόρευσε διὰ τὸ τέλειον εἶναι καὶ πᾶσι κεκοσμηθῆναι τοῖς τε ζώοις καὶ τοῖς καλοῖς. (Anon. Phot. *Bibl. Cod.* 249.440a 27–9 = p. 240.3–5 Thesleff)

Pythagoras was the first to call the heavens ‘*kosmos*’, because it is perfect and adorned with all the living beings [stars?] and the fineries.

This doxographical account elaborates on the standard position about Pythagoras’ *kosmos*, advanced by Favorinus. For the unknown author explains that the heavens are called ‘*kosmos*’ because they are perfect, by which he means, they are adorned (κεκοσμηθῆναι) with all the living beings (here he probably means stars) and the fineries. As such, the *kosmos* is itself a place for life and beauty – a consequence of the determinism implicit in its teleology. We cannot be sure, on the evidence of these two late sources, that correspondent notions of teleology and proper order were assumed in Pythagoras’ own use of the term ‘*kosmos*’, because Pythagoras left no writings which we could consult in order to confirm or deny this speculation.

Still, it is possible to gain some ground on that question by examining the writings of the Pythagoreans in Pythagoras’ school, especially the philosopher Philolaus of Croton (ca. 470 – ca. 385 BCE).³⁸ We know something about Philolaus’ life: he was from Croton or Tarentum, in Southern Italy. Philolaus allegedly fled Croton around 450 BCE, along with a number of Pythagoreans who were threatened by local politicians. As an exile, Philolaus first travelled to Lucania, modern Basilicata in Italy, where he shored up support; and then to Thebes in mainland Greece, where he became the teacher of several notable junior philosophers. His visit to Thebes is portrayed in Plato’s dialogue *Phaedo*, where Socrates conducts a debate with Philolaus’ students Simmias and Cebes, on the question of whether the soul is immortal.

It is generally agreed that Philolaus is the first Pythagorean to have written down his philosophical views in a book. The work, a brief but compelling treatise which survives only in fragments, was later given the title *On Nature*, i.e., *Physics*. In it, Philolaus, like Hesiod before him, set out to explain the principles of reality,

³⁸ In general, for Philolaus’ life, texts, and philosophy see Huffman 1993. The translations of Philolaus here are sometimes adapted from Huffman’s own translations.

the emergence and transformation of the world, and the structures that underpin the universal order. Philolaus additionally treated of various philosophical and scientific aspects related to these topics, including epistemology (with special interest in how we *can* know the principles of reality), astronomy (including the arrangement of what we call the solar system), embryology (especially the formation of the human foetus), and individual human psychology. Philolaus also made important discoveries in music theory, which he integrated into his cosmological speculation, thus confirming the famous attribution to the Pythagoreans, first found in Aristotle, of the so-called ‘harmony of the cosmic spheres’.

Thanks to Demetrius of Magnesia (fl. 1st century BCE), we know how Philolaus’ book began:

ἀ φύσις δ’ ἐν τῷ κόσμῳ ἀρμόχθη ἐξ ἀπείρων τε καὶ περαινόντων καὶ ὅλος <ὁ> κόσμος καὶ τὰ ἐν αὐτῷ πάντα. (Philolaus DK 44B1 = L&M 12 D2 = *FGrHist* 1038 F 12 = Diog. Laert. 8.85)

Nature in the cosmos was fitted together both out of things which are unlimited and things which are limiting – both the cosmos as a whole and all the things in it.

It is interesting to note that, in what appears to be the proem to *On Nature*, Philolaus does not (a) mention himself by name, i.e., there is no *sphragis*; and he does not (b) mention those predecessors whose works and ideas in which he would seek to situate his own.³⁹ Everything is more decisively universal, rather than subject to autopsy or personal circumstances. Moreover, while Philolaus does go on at some point in the work (in Fragment B6)⁴⁰ to identify the limiters and unlimiteds as principles (ἀρχαί) – hence, understanding the ‘principles’ to be primary in terms of both the topic of the work and the bases of reality – they are not called so here in the first sentence, nor does he start ‘from the beginning’, as in the Hesiodic proemial tradition. This raises a puzzle, and a challenge to this paper’s hypothesis that proems in these works do not simply function as formal literary devices or as means to substantiate one’s place in a competition for wisdom, but rather that they have a content function related to establishing the bases for reality. A fuller analysis of this issue will come later in this paper, but one initial idea is that B6 is still part of the proem in Philolaus’ *On Nature*. Finally, the introduction of ‘limiters’ and ‘unlimiteds’ gives reason to wonder about what Philolaus is really talking about. Indeed, scholars are still at a loss to determine what the primordial entities

³⁹ Contrast the beginning of the treatise by Philolaus’ rough contemporary, Alcmaeon of Croton (DK 24B1 = L&M 23 D1): ‘Alcmaeon of Croton, son of Peirithous, said these things to Brontinus, Leon, and Bathyllus, concerning what is not apparent: concerning mortal things, the gods possess certainty, but for humans, [there is a need] to bear witness [...]’.

⁴⁰ DK 44B6 = L&M 12 D5 = Stob. *Ecl.* 1.21.7b. I quote the fragment below.

that make up the cosmos, the limiters and the unlimiteds, really are.⁴¹ Philolaus actually provides very little help with this: in Fragment B2, for example, all that we learn is that things derived from limiters limit, and things derived from unlimiteds are unlimited.⁴²

In the context of the cosmological theory of Hesiod, it is possible to advance a new hypothesis concerning Philolaus' account of the first principles – which, to my knowledge, has never been advanced. For Hesiod, earth in the 'pre-cosmic' stage is a sort of matter with extension, but lacking external boundaries. Once Heaven mates with Earth, she is given limits, which makes it possible for Earth to have external differentiation – to become a surface space. From this perspective, Philolaus' 'unlimiteds' refer to what, in Hesiod, is Earth, i.e., stuffs with extension but no definition; and his 'limiters' refer to Hesiod's Heaven, i.e., entities that provide external boundaries to the stuffs. On this reading, Philolaus is not totally innovating within the cosmogonic traditions of ancient Greece, as scholars sometimes assume; instead, he will have adapted two principles he found in Hesiod, Earth and Heaven, but modified them through demythologization, in order to advance a novel cosmogonic theory freed from the accoutrement of divine genealogies. This could be interpreted in two ways: if we consider the beginning of Philolaus' *On Nature* to appropriate Hesiod's principles in his own proem to reality, Philolaus would be showing, without telling, his audience the inheritance of Hesiodic views; but if we bring into focus the universalizing and non-contingent tone of Philolaus' proemial statement, Philolaus is simply restating, with greater clarity, and precision, what Hesiod also recognized, i.e., the principles of orderly reality. As far as it survives, the proem to Philolaus' work does not adjudicate between these possibilities; it leaves them open to the reader who does, or who does not, know Hesiod, or who does, or does not, care about the competition for wisdom.

Now, some doubt about this paper's hypothesis concerning Philolaus' adaptation of Hesiod's proemial account could be raised: someone might think, for example, that this hypothesis sounds plausible with reference to Earth and Heaven,

41 Burkert 1972, 258–260 thought the limiters correspond to atoms, and unlimiteds correspond to empty interstices between them. But there is nothing in the fragments to confirm this, and while the Atomist Democritus was indeed trained by a Pythagorean, there is no evidence that he obtained his Atomist views from the Pythagoreans (rather, they came from Leucippus). Could the limiters and unlimiteds be numbers? On this reading, advanced essentially by Aristotle and defended by Schofield (2012, 47–48), the limiters are odd numbers, and the unlimiteds are even numbers. But there is nothing in the two fragments, on their own, to strongly support this reading either. Moreover, other fragments of Philolaus that discuss number (e.g., DK 44B5 = L&M 12 D9 = Stob. *Ecl.* 1.21.7c) imply that there is a strong *connection* between various species of number and the limiters and unlimiteds, but these fragments do not actually identify them.

42 DK 44B2 = L&M 12 D3 = Stob. *Ecl.* 1.21.7a.

as the correspondences there with unlimiteds and limiters might be compelling. But what about the other two pre-cosmic deities of Hesiod's proem, Eros and Tartarus? One Hesiodic god for whom there is no difficulty in detecting a parallel in Philolaus' work is Eros. For in fragment B6 of *On Nature*, Philolaus speaks of a force that comes upon the limiters and unlimiteds in just the way (as I have proposed) Eros influences Heaven and Earth. The force that corresponds to Hesiodic Eros is called 'harmony' (ἀρμονία):

περὶ δὲ φύσιος καὶ ἀρμονίας ὧδε ἔχει· ἃ μὲν ἐστὼ τῶν πραγμάτων αἰδῖος ἔσσα καὶ αὐτὰ μὲν ἃ φύσις θεῖαν τε καὶ οὐκ ἀνθρωπίνην ἐνδέχεται γνῶσιν, πλάν γὰρ ἢ ὅτι οὐχ οἶον τ' ἢ οὐθενὶ τῶν ἐόντων καὶ γιγνωσκομένων ὑφ' ἀμῶν γενέσθαι, μὴ ὑπαρχούσας τὰς ἐστούς τῶν πραγμάτων ἐξ ὧν συνέστα ὁ κόσμος καὶ τῶν περαινόντων καὶ τῶν ἀπείρων. ἐπεὶ δὲ τὰ ἀρχαὶ ὑπάρχον οὐχ ὁμοῖαι οὐδ' ὁμόφυλοι ἔσσαι, ἥδη ἀδύνατον ἥς καὶ αὐταῖς κοσμηθῆναι, εἰ μὴ ἀρμονία ἐπεγένετο ὥτινῶν ἂν τρόπῳ ἐγένετο. τὰ μὲν ὧν ὁμοῖα καὶ ὁμόφυλα ἀρμονίας οὐδὲν ἐπεδέοντο, τὰ δὲ ἀνόμοια μὴδὲ ὁμόφυλα μὴδὲ ἴσοταχῇ† ἀνάγκα τᾷ τοιαύτῃ ἀρμονίᾳ συγκεκλειῆσθαι, εἰ μέλλοντι ἐν κόσμῳ κατέχεσθαι. (Philolaus DK 44B6 = L&M 12 D 5 = Stob. *Ecl.* 1.21.7d)

Concerning nature and harmony, the situation is this: the being of things, which is eternal, and nature herself admit of knowledge that is divine, and not human – except that it was impossible for any of the things that are, and that are known by us, to have come to be, if the being of the things from which the cosmos came together, both the limiters and the unlimiteds, did not preexist. But since these beginnings preexisted and were neither alike nor even related, it would have been impossible for them to be ordered, if a harmony had not come upon them, in whatever way it came to be. So then, like things and things of the same kind did not require any harmony additionally, but things that are unlike, being neither of the same kind nor †of equal speed† – it is necessary that such things be bonded together by harmony, if they are going to be held in order.

Regardless of the many puzzles raised by this fascinating fragment, it is relatively clear that harmony plays the same role that Eros, or love/desire, plays in Hesiod's cosmogony: it is the force that compels, one way or another, things that are unlike and 'of a different kind' to bond together in a unity. Without this binding, the ordered universe as we know it could not have been originally ordered.⁴³

Now with reference to the limiters, unlimiteds, and harmony, and Heaven, Earth, and Eros, the cosmogonies of Hesiod and Philolaus show important correspondences. But this is where the *obvious* similarities end. As we will recall, Hesiod includes two further entities among his original four: Chaos, whom we identified with primordial gap or interval, and Tartarus, whom we identified with the obscurity of darkness. Neither of these two figures is, in any straightforward way, par-

⁴³ Binding is a central aspect of the cosmogony of Hesiod's *Theogony* as well. Cf. Strauss Clay 2021, 24–29.

alleled in Philolaus' account of the first principles. Moreover, Philolaus includes another force, which is not easily associated with anything in Hesiod: he calls it 'the being of things' (ἀ ἐστὼ τῶν πραγμάτων). Philolaus says very little about this, and we are left to conjecture what it really is: we are told it is eternal (which doesn't help much, since the implication is that the limiters and unlimiteds are eternal as well), and that it cannot be acquired through human knowledge, except in very specific ways (involving abductive reasoning). However, Fragment B6 does give us a hint about the being of things, because it is set alongside nature in a specific way. For the fragment mentions, in this order, nature : harmony :: being of things : nature. This appears to be chiasmic in structure: a : b :: b : a. Possibly the being of things just is the harmony that pre-exists the principles, limiters and unlimiteds. If so, the 'being of things' in Philolaus would also correspond, like harmony, to Eros in Hesiod.

All of this speculation leads to an important conclusion about Philolaus: insofar as he was adapting the Hesiodic *prooimion* to reality, he excluded the forces that, one way or another, eventuated time and all the forces of discord in later generations: Chaos and Tartarus. If, as we speculated previously, Pythagoras was a committed cosmic teleologist, this might have influenced Philolaus to exclude at least the dark force of Tartarus; but this hypothesis would do little to explain the *apparent* exclusion of Chaos. Moreover, at first glance at least, it would appear that Philolaus has removed the genetic element: without gods mixing sexually with one another, there is no implication of biomorphic cosmogony. Indeed, it is clear that 'harmony' causes the limiters and unlimiteds to come together; but the metaphor of their mixing is totally desexualized. Still, this does not imply Philolaus rejects the biomorphic model of cosmogony. In another fragment, Philolaus tells us:

τὸ πρῶτον ἄρμωσθέν, τὸ ἐν ἐν τῷ μέσῳ τᾶς σφαίρας, ἐστία καλεῖται. (Philolaus DK 44B7 = L&M 12 D15 = Stob. *Ecl.* 1.21.8)

The first thing fitted together, the one in the centre of the sphere, is called 'hearth'.

This fragment outlines the next step in Philolaus' cosmogony. It reveals that, for Philolaus, the combination of limiters and unlimiteds motivated by harmony produces a sphere, and the first individuated item in that sphere is a fire located at its centre. This fire is called 'hearth', probably because it was conventional in Ancient Greece for the centre of a home to feature a hearth to heat it. Indeed, another testimony clarifies that the fire is called 'the house of Zeus', in the sense of Zeus' home on Olympus.⁴⁴ So, the fire at the centre of the cosmos – surrounded by the

⁴⁴ Cf. Philolaus DK 44A16 = L&M 12 D19 = Aetius 2.7.7.

so-called ‘counter-earth’, earth, moon, sun, the 5 other planets, and the fixed stars of heaven – corresponds to Zeus’ home on Olympus. But the domestic metaphor is actually secondary to the biomorphic, as we see from a testimony provided by Aristotle’s student Meno. This testimony, preserved only for us on a 2nd century CE papyrus in the collection of the British Library, is crucial for understanding Philolaus’ cosmogony, because it explains, by way of analogy, how the fire at the centre of the cosmos interacts with what is outside the sphere, in order to catalyse internal articulation:

Φιλόλαος | δὲ ὁ Κροτ[ωνιά]της συνεστάναι φησὶν τὰ ἡμέ[τε]ρα σώμ[ατα ἐκ] θερμοῦ. ἀμέτοχα γὰρ αὐτὰ εἶναι | ψυχροῦ[, ὑπομ]ιμνήσκων ἀπὸ τινων τοιούτων· | τὸ σπέρμ[α εἶναι θερμὸν, κατασκευαστικὸν δὲ | τοῦτο τ[οῦ ζώου]· καὶ ὁ τόπος δέ, εἰς ὃν | ἡ καταβολ[ή – μήτρ]α δὲ αὕτη – ἐστὶν θερμότερα | καὶ εὐκ[υῖα ἐκ]εῖν· τὸ δὲ εὐικός τινι ταῦτὸ δύνανται ὥς εὐικεν· ἐπεὶ δὲ τὸ κατα|σκευάζ[ον ἀμέ]τοχόν ἐστιν ψυχροῦ καὶ ὁ τόπος | δέ, ἐν ᾧ [ἡ καταβολ]ή, ἀμέτοχος ἐστὶν ψυχροῦ, | δῆλον [ὅτι καὶ τὸ] κατασκευαζόμενον ζῶον | τοιοῦτο[ν γίνε]ται. εἰς δὲ τούτου τὴν | κατασκ[ευὴν ὑ]πομνήσει προσχρήται τοιαύ[τῃ· μετὰ γάρ], φησὶν τὴν ἔκτεξιν εὐθέως | τὸ ζῶιον ἐπισπᾶται τὸ ἐκτὸς πνεῦμα | ψυχρὸν ὄν· εἴτα πάλιν καταπερεὶ χρέος | ἐκπέμπε[ι] αὐτό· διὰ τοῦτο δὴ καὶ ὄρεξις | τοῦ ἐκτὸς πνεύματος, ἵνα τῇ | ἐπεισάκτῃ τοῦ πνεύματος ὀλκῇ θερμό|τερα ὑπάρχοντα τὰ ἡμέτερα σώματα πρὸς αὐτοῦ | καταψύχῃται. καὶ τὴν μὲν σύστασιν | τῶν ἡμετέρων σωμάτων ἐν τούτοις φησίν. | (Philolaus DK 44 A 27 = L&M 12 D25 = Anon. Lond. 18.8–19.1)

Philolaus of Croton states that our bodies are constituted out of heat. For, he says, they have no share of cold, suggesting this from the following considerations: the seed is hot, and this is what provides articulation for the living being. And the place into which there is its ejaculation – this is the uterus – is quite hot and resembles it. And what resembles something has the same capacity as that which it resembles. Since that which provides articulation has no share of cold, and the place in which its ejaculation occurs has no share of cold, it is clear that the living being that is articulated turns out to be of the same sort [sc. it has no share of cold]. With regards to the articulation of the living being, he adds the following consideration. For, he says, immediately after birth, the living being breathes in the external air, which is cold; next, he sends it back out again, like a debt. Indeed, it is for this reason that there is a desire for the external air, so that our bodies, which were too hot before, by the drawing in of breath from the outside, are cooled thereby. He says, then, that the constitution of our bodies depends on these things.

This testimony, which is full of references to contemporary 5th century BCE medical theory (especially that of the Hippocratic doctors), helps us to conceptualize how the cosmos goes from being a sphere composed of limiters and unlimiteds, brought into correspondence through harmony, to a living being.⁴⁵ For, like the creature

⁴⁵ For a more comprehensive study of the relationship between the harmonic formation of the cosmos and the animal in Philolaus’ fragments, see Schluderer 2020, 224–226.

mentioned by Meno (no doubt a human, but possibly other kinds of animals as well), the cosmos features a primary element, the fire at its centre, and that element's chief property, the hot. The process of insemination of the uterus involves no forces of opposition, since seed and uterus are *both* hot – indeed, uterus is hotter than seed. So in the process of generating a foetus, there is like interacting with like – no need for harmony to bring things unlike one another into correspondence. It is only once the infant is born that he breathes in the cold air from outside, thereby catalyzing his internal arrangement and coming into life. We must imagine something similar in the case of the Pythagorean cosmos: at first, the sphere is dominated by the heat generated internally by its fire at the centre. But then, in order for it to obtain internal articulation, and thereby to become a living being, the cosmos must, like a newborn baby, breathe in the cool air from the outside – in this case, something like void. Aristotle confirms this reading in his *Physics*:

εἶναι δ' ἔφασαν καὶ οἱ Πυθαγόρειοι κενόν, καὶ ἐπεισιέναι αὐτὸ τῷ οὐρανῷ ἐκ τοῦ ἀπείρου πνεύματος ὡς ἀναπνέοντι καὶ τὸ κενόν, ὃ διορίζει τὰς φύσεις, ὡς ὄντος τοῦ κενοῦ χωρισμοῦ τινὸς τῶν ἐφεξῆς καὶ διορίσεως. (Arist. *Ph.* 4.6, 213b22–26)

The Pythagoreans, too, held that void exists and that it enters the heaven from the infinite breath, the *kosmos* inhaling also the void which distinguishes the natures of things as if it were what separates and distinguishes the terms of a series.

As Aristotle testifies, the proper internal arrangement of the parts of the Pythagorean cosmos can only be made possible through the primordial act of breathing – the cosmos inhales void from outside its external boundaries, and this activity cools the sphere internally. The blending of hot and cold is like the blending of limiter and unlimited that produced the sphere in the first place, and we are encouraged to speculate how the recurrence of this blending at every stage of the constitution of reality is observed. Hence, Philolaus produces a truly systematic, repeatable, and understandable process of world creation, that occurs at the level of the macrocosm – in the world-order itself – and at the level of the microcosm – in the birth of an infant. From this perspective, we can still speak of a 'biomorphic' mode of cosmogony – and like Hesiod's cosmogony, where we distinguished primary (or proemial) and secondary stages of cosmogonic development, Philolaus also understands a distinction between the initial coming together of the limiters and unlimiteds to establish any order at all, and the subsequent stages of creation that inform the primordium. We understand, then, the progression from cosmogony to cosmology as a progression from proem to ordered reality.

There is one final consequence that emerges from our treatment of Philolaus' cosmological account on *On Nature*, which helps to situate it better in relation to Hesiod's *Theogony*, and to respond to a puzzle raised earlier on: for the introduc-

tion of a notion of cosmic breathing unveils another element of Philolaus' proem to reality that had been hiding just beyond our sight, namely, the notion of void. Philolaus' void, which is breathed in from outside the sphere, corresponds to Hesiod's Chaos, insofar as both indicate the spaces or intervals between things that provide regular order. Aristotle takes this even further, suggesting that the void breathed into the Pythagorean cosmos is the same thing that provides systematic order to numbers in a series. Hence, Philolaus' void, which corresponds to Hesiod's Chaos, also reveals itself to be fundamental to the persistence of repeatable order in reality.

As this paper draws to a close, it is worth returning to Chaos in the proem of Hesiod once again. For someone might wonder just this: if it is the case that Chaos is not a dark, pernicious, chaotic element in Hesiod's cosmology, *when*, exactly, did Chaos did become a force associated with these negative attributes? The answer lies with the Roman poet Ovid, who, writing in the proem to his epic poem *Metamorphoses* at the close of the 1st century BCE:

Ante mare et terras et quod tegit omnia caelum	5
unus erat toto naturae vultus in orbe,	
quem dixere chaos: rudis indigestaque moles	
nec quicquam nisi pondus iners congestaque eodem	
non bene iunctarum discordia semina rerum.	
nullus adhuc mundo praebebat lumina Titan	10
nec nova crescendo reparabat cornua Phoebe,	
nec circumfuso pendebat in aere tellus	
ponderibus librata suis, nec brachia longo	
marginibus terrarum porregerat Amphitrite;	
utque erat et tellus illic et pontus et aer,	15
sic erat instabilis tellus, innabilis unda,	
lucis egens aer; nulli sua forma manebat,	
obstabatque aliis aliud, quia corpore in uno	
frigida pugnabant calidis, umentia siccis,	
mollia cum duris, sine pondere, habentia pondus.	20
Hanc deus et melior litem natura diremit.	
nam caelo terras et terris abscidit undas	
et liquidum spisso secrevit ab aere caelum.	
quae postquam evoluit caecoque exemit acervo,	
dissociata locis concordiae pace ligavit:	25
ignea convexi vis et sine pondere caeli	
emicuit summaque locum sibi fecit in arce;	
proximus est aer illi levitate locoque;	
densior his tellus elementaque grandia traxit	
et pressa est gravitate sua; circumfluitumor	30
ultima possedit solidumque coercuit orbem. (Ov. <i>Met.</i> 1.5–31)	

Before there was sea, and lands, and sky which covers all things 5
 The face of nature in the world was completely one
 Which they called 'Chaos': a rough and confused mass,
 And nothing but a lifeless weight and warring seeds
 Of things, poorly conjoined, heaped into one.
 No Titan [sc. sun] as yet offered light to the cosmos, 10
 Nor did new horns grow back for the waxing Phoebe [sc. moon],
 Nor did the earth hang suspended in air suffused,
 Freed from her own weight, nor had Amphitrite [sc. the ocean]
 Extended her arms along the far stretches of the lands.
 And though earth, sea, and air were there, 15
 Earth could not be tread, nor waves breached,
 Nor the air seen: no shape of anything was stable,
 Each at odds with one another, since, in one body,
 Cold strove against hot, wet against dry,
 Soft against hard, and light against heavy. 20
 God, and better Nature, made these divisions,
 For he sundered lands from sky, waves from lands,
 And separated flowing heaven from thick air.
 After he unfurled and removed them from the blind heap,
 The fractious parts he fixed in places with harmonious peace. 25
 No weight to hold it down, the fiery power of vaulted heaven
 Leaped and made a place for itself in the summit dome;
 Air comes next, both in rarity and location;
 Heavier than these, earth pulled in more voluminous parts,
 And, for its gravity, sank below; and, last of all, 30
 Waves surging round gripped and bound the whole world.

I have only presented the part of the proem that describes the pre-cosmic state as Chaos; what follows upon the separation of reality into its elemental constituents are the divine commandments of god, which fulfil His desire for a beautiful world. It has been recognized that Ovid has made many innovations here, including the fact that Ovid's Chaos is a far cry from Hesiod's in the *Theogony* (a poem Ovid knew exceedingly well); but what tends to fall under the radar is the importance of Ovid's choice of cosmogonic mode for his proem. For Ovid's mode of cosmogony is distinctly 'technomorphic', in the sense that it is by virtue of god's skillful act of separating out the Chaotic mass that reality is given shape. This raises an important question: is the notion of Chaos as disorderly mass something attendant chiefly to technomorphic modes of cosmogony in the ancient world? For Hesiod and Philolaus, the intervals of reality (Chaos and the void) *just are* – they are not superimposed by a skillful creator god, who aims to articulate the universe according to principles of order, and sometimes in his own image. If this is right, we might ask ourselves whether our own notions of Chaos carry with them such baggage as Ovid has foisted upon the Western tradition – implicit assumptions about what sorts of

states can emerge from others, and who, or what, is acting as agent in the cosmogonic performance. Regardless of how we respond to these provocations, this study suggests new ways to grasp how a proem can reach beyond the confines of literary form, to become literally, and figuratively, world-forming.

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