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Order and chaos in the ancient Greco-Roman philosophical imagination

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Abstract: When did chaos come to be opposed to order? This paper considers the earliest references in the Western world to the concepts of “chaos” (Χάος) and “order” (κόσμος), understood as cosmological concepts; these terms are first attested in the epic *Theogony* of the ancient Greek poet Hesiod and the treatise *On Nature* of the Pythagorean philosopher Philolaus of Croton. This paper argues by way of a close reading of these texts that originally chaos was instrumental to an orderly Universe and that this idea persisted in the formal development of cosmological texts in the Greek world. The paper concludes by suggesting that the first person in the Western world to make chaos the opposite of order, i.e. absence of order or disorder, was the Roman epic poet Ovid in his celebrated *Metamorphoses* some seven hundred years after Hesiod first accounted for the role of chaos in instantiating the world order.

This paper seeks to investigate the earliest attestations in the Western world of the binary between chaos and order. It does so by way of considering how the ancient Greeks came to conceptualise the terms “chaos” (Χάος or the god Chaos) and “order” (κόσμος or *kosmos*) in cosmic terms. For the conceptual development of these terms from their standard usages (as, respectively, a primordial deity and as a basic notion for any orderly arrangement, e.g. a well-sung song or an orderly march of soldiers) to their application in cosmology is striking and unique among ancient civilisations. This paper will focus on one type of cosmogonic mode, which has repercussions for the ways in which order and disorder are conceptualised: this mode is referred to as the ‘biomorphic’. By ‘biomorphic’ is meant a cosmogonic mode that is based on or analogous to the processes of animal generation – especially the procreation of human beings. Two examples of biomorphic cosmogony to be discussed in this paper will be that of Hesiod in the *Theogony* (late 8th – early 7th century BCE) and that of Pythagoras of Samos and the early Pythagorean Philolaus of Croton (6th – 5th centuries BCE) in the latter’s fragmentary work *On Nature*. There were two other modes of cosmogonic creation popular in ancient Greece and Rome, which this paper will not cover in detail: the ‘stochazomorphic’ and the ‘technomorphic’. By ‘stochazomorphic’ is meant models that understand cosmic determination as a process caused by randomness or chance. Prime examples of stochazomorphic cosmogony in Greco-Roman antiquity include those of the Atomists Leucippus, Democritus and Epicurus. A third model for cosmogony is the ‘technomorphic’. By ‘technomorphic’ is meant a cosmogonic mode that refers the activity of cosmic creation to a craftsman or artisan god, who ‘makes’ or ‘shapes’ the cosmos. Examples of technomorphic cosmogony include the creation account in the Hebrew book of *Genesis* and Plato’s *Timaeus*.

This paper will focus on two concepts of potential salience to modern theories of cosmology: chaos and *kosmos*. It will emerge in the course of this discussion that in Archaic and Classical Greece far from being its opposite, chaos was a fundamental element of *kosmos* and was associated with disorder only



in derivative and circumstantial ways. The opposite of *kosmos* is another term that has not featured much in the history of ancient physics, namely, *akosmia* – which literally means ‘absence’ or ‘privation of order’. An ancient history of disorder qua *akosmia* remains to be undertaken by scholars. It should be noted that it is a curious feature of modernity that we persist in using the word ‘chaos’ to refer to a force or state of disorder *per se*. As noted later in the conclusion the notion of chaos as a force or state of disorder is derived ultimately from the Roman poet Ovid (43 BCE – 17 CE), whose *Metamorphoses* was published around seven centuries after the first appearance of Chaos in Hesiod’s *Theogony*.

It is now a well-established view among scholars of the ancient Greek world that the earliest accounts of the primordium, Hesiod’s *Theogony* and sections of Homer’s *Iliad* and *Odyssey*, were partially influenced by prior cosmogonic stories passed down in the Ancient Near East. Two scholars in particular, Martin Litchfield West (who wrote much of his formative work at University College, Oxford and at All Souls College, Oxford) and Walter Burkert (who was based at the University of Zurich) sought to track the influence of Near Eastern myths on early Greek poetry, stimulated by the fact recognised a generation before them, that the cosmogonic account presented in Hesiod’s *Theogony* demonstrates undeniable parallels with the Hittite Songs of Kumarbi and Ullikummi [1]. 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 latecomer in the history of theogonic narratives in the West.

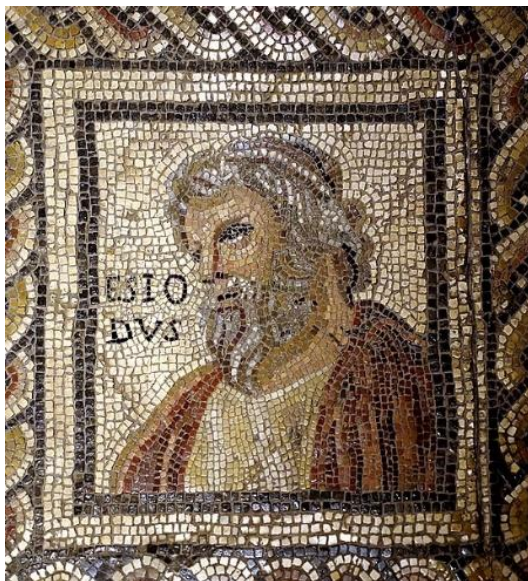


Figure 1. Mosaic of Hesiod from the Rheinisches Landesmuseum Trier, Late 3rd century CE. Source: Wikimedia Commons.

Hesiod was a poet from Ascra in Boeotia, who is thought to have lived in the late 8th or early 7th century BCE (see figure 1). His poem *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. Before turning to the treatment of Chaos in this poem, its contents will be briefly summarised. 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. 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*. It traces the two families that descend from the first parents: the family of Chaos, who is himself first-born (this will be returned to later) and the family of Gaia or as her name is translated, Earth, whose children include Ouranos or as his name is translated, Heaven with whom Gaia ‘mixes’ in order to produce the next generation, the Titans (the patriarch of whom is Kronos). Among

the first generation of gods, Tartarus has only one child, Typhoeus and Eros has no children. The grandchildren of Gaia and the 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. The second succession myth is similar: Kronos, patriarch of the Titans, learnt in an oracle from his grandmother Earth and (usurped) grandfather Heaven that his own son was fated to overthrow him. Seeking not to replicate his father's mistakes, Kronos swallowed his own children, in the hope that so imprisoned inside himself, they would be prevented from overthrowing him. But Rhea, Kronos' consort and mother to the Olympian gods, decided to trick Kronos and wrapped a stone in swaddling clothes, which Kronos unthinkingly ate. For his own part, Kronos' son Zeus was hidden in a cave in Earth (this time for protection) and eventually grew enough to challenge his father Kronos. Zeus called upon his great uncles – the Cyclopes and Hundred-Handers – whom he freed from their chains (it is unknown whether Ouranos or Kronos had originally imprisoned them). As a gift for their liberation the Cyclopes bestowed upon Zeus the gifts of thunder and lightning. Supported by these figures, Zeus waged 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 before, 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:

T1. Hesiod, *Theogony* 114-28

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.

ταῦτά μοι ἔσπετε Μοῦσαι Ὀλύμπια δώματ' ἔχουσαι
ἐξ ἀρχῆς, καὶ εἶπαθ' ὅτι πρῶτον γένετ' αὐτῶν. 115
Ἦτοι μὲν πρότειστα Χάος γένετ'· αὐτὰρ ἔπειτα

Γαῖ' εὐρύστερνος, πάντων ἔδος ἀσφαλὲς αἰεὶ
ἀθανάτων οἳ ἔχουσι κάρη νιφόεντος Ὀλύμπου,
Τάρταρά τ' ἠερόεντα μυχῶ χθονὸς εὐρυοδείης,
ἡδ' Ἔρος, ὃς κάλλιστος ἐν ἀθανάτοισι θεοῖσι,
120
λυσιμελής, πάντων τε θεῶν πάντων τ' ἀνθρώπων
δάμναται ἐν στήθεσσι νόον καὶ ἐπίφρονα βουλήν.
Ἐκ Χάεος δ' Ἔρεβός τε μέλαινά τε Νύξ ἐγένοντο·
Νυκτὸς δ' αὖτ' Αἰθήρ τε καὶ Ἡμέρη ἐξεγένοντο,
125
οὓς τέκε κυσαμένη Ἐρέβει φιλότιτι μιγεῖσα.
Γαῖα δέ τοι πρῶτον μὲν ἐγένεατο ἴσον ἑωυτῇ
Οὐρανὸν ἀστερόενθ', ἵνα μιν περὶ πάσαν ἔργοι,
ὄφρ' εἴη μακάρεσσι θεοῖς ἔδος ἀσφαλὲς αἰεὶ.

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 wasted no words. First of all, Chaos, whom Hesiod invented (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 Chaos will be referred to here with the pronoun 'it'. The second god born was Gaia or Earth (her generation is only described with the term *ἔπειτα* with no actual verb stated), although Hesiod implied 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 would never in the course of the *Theogony* mix with the family of Earth: they were kept totally separate throughout. This is pretty much all that is heard in this passage about Chaos: that it was first-born and that it had 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: the line simply says that they were generated from Chaos (*Ἐκ Χάεος*) and not that it *actively* gave birth to them). Hence, in this brief (but salient) introduction, Chaos is effectively without any properties.

Hesiod's silence on Chaos' attributes prompts the question: what exactly *is* Chaos? To some extent it can be inferred what Chaos is by figuring out what it *is not*, i.e., it is not its siblings. In the first place Chaos is not Earth. What is Earth? As Jenny Strauss Clay, the foremost living authority on Hesiod, notes, Earth's primary quality is stated proleptically by Hesiod: she is the seat of the gods – or rather she *became* 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 [2]. Since Earth played the role of the ground where the gods would place their homes, Chaos would appear not to be this. Moreover, Chaos was not its third-born brother Tartarus. Not much is said about Tartarus here: one only hears that he was misty or dim (*ἠερόεντα*), and that he occupied a 'nook' (*μυχῶ*) in the ground – presumably a gap in the Earth (these descriptors of Tartarus will be returned to later on). As mentioned in the summary of the *Theogony*'s contents, Tartarus was eventually revealed to be the furthest limit of the Hesiodic cosmos, a place of ultimate darkness where the Titans would be imprisoned and suffer punishment. So Chaos is not a dark entity. Finally, Chaos is not Eros, the most beautiful of the immortals, who also produced no heirs, but was the force or power of desire for consummation. It is clear from this brief introduction that Hesiod understood Earth, Tartarus and Eros to influence one another: Tartarus found his place in a nook on or under the Earth and Eros stimulated Earth to mate with her son Heaven, which led to the establishment of boundaries around her surface.

Given the fact that comparison with its siblings merely reinforces Chaos' distinctiveness, one might consider how its children might help to determine its qualities. This is the approach taken by David Sedley, in an important article published in 2009 [3], where Sedley contends against the consensus view that Chaos is a force of disorder and the source of evil in Hesiod's universe. Sedley's approach, which

tracks the genetic inheritance of attributes, seems valid and it pushes the biomorphic model to its 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, one cannot determine its properties by examining its mother or father; so one will have to examine its children, as well as its further descendants.

As mentioned previously, Hesiod claimed that Erebus, or thick darkness, and black Night, were generated ‘from’ or ‘out of’ Chaos. In turn Erebus copulated with Night in order to produce their opposites, Aether (or vivid brightness) and Day. It is clear then that what eventually emerged from Chaos was 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 it might be thought that Chaos was just *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 emphasised later on in the *Theogony*:

T2: Hesiod, *Theogony* 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.

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

Hesiod’s welcoming metaphor of the circuits of Day and Night highlighted the balance that is obtained through their motions along the ecliptic. Moreover, Day and Night are denied co-presence: they could not be in the ‘house’ of Heaven perpetually held aloft by Atlas at the same time, but they kindly wished one another well, upon arrival and departure. Hence, it might be thought along 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. Moreover, according to Sedley, all the attributes of the other children of Night who have not yet been mentioned – 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 was the ultimate ‘source of evil’ [4]. But Sedley’s interpretation strains the metaphor of the biomorphic mode of cosmogony and the attendant notion of genetic inheritance of properties. Below is explained why.

It is clear that Hesiod understood Chaos to be capable of producing two entities all by itself: Erebus (or darkness) and Night. It produced the brother and sister parthenogenetically, like Earth, who herself produced Heaven parthenogenetically. It is also implied in both the cases of Chaos and Earth that primordial parthenogenesis required no force of desire. Rather, it is *only* after Earth produced Heaven parthenogenetically that her brother Eros, or desire, exercised his power over her, so that she commingled with her son Heaven to produce the next generation. Chaos did no such thing: it never copulated and hence the implication is that Chaos was never subjected to its brother Eros’ power. Rather, it is Chaos’ children Erebus and Night who found themselves compelled to copulate and Hesiod was emphatic about this – he spoke of Night being ‘fused in love’ or ‘blended through desire’ (φιλότῃτι μυγεῖσθαι) with Erebus. Hence, it is clear that in the family line of Chaos its daughter Night was the first to be subjected to the power of Eros, which was, as seen with Earth, the central driver of second-order generation of beings (i.e. after parthenogenesis). This raises an important question that has not, to my knowledge, been treated by most scholars dedicated to explaining this passage: is it possible that Tartarus, the forgotten other sibling from among the first generation of gods, played some role in the generation of the forces of discord?

A careful reading of these passages that tracks the attributes passed down suggests just this. For if the section describing the relationship between the mother Day and the daughter Night is examined, it is seen 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’ (ἡρόεντα) and ‘in a nook of the wide-pathed ground’ (μυχῷ χθονὸς εὐρυοδείης). 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 found themselves imprisoned in the poem. How does this relate to Night? In line 757, Night is said to be ‘noxious, veiled in murky cloud’ (ὀλοή, νεφέλη κεκαλυμμένη ἡροειδεῖ). 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 ἡροειδεῖ, and Tartarus’ primary attribute as ἡρόεντα). Hence, it is by virtue of the force that Tartarus exerted (somehow) over Chaos that Night and Erebus were generated from it. Consequently, the fact that Night, and her descendants were creatures of darkness and eventually of conflict and destruction, is not owed to her generation from Chaos, who, as noted before, was without qualities, but rather to Tartarus’ influence over Chaos. What exactly this influence was cannot be clearly inferred from the text; at any rate, the fact that Chaos is not sexually differentiated would help to explain why Tartarus did not mingle with Chaos to produce Night and Erebus.

It might seem that this 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 the hypothesis helps to explain something that remains wanting with regard to the analysis of the first passage of Hesiod’s *Theogony*. For, as noted briefly, Tartarus is presented in the first instance not only as ‘dim’ (ἡρόεντα), but also as ‘in a nook of the wide-pathed ground’ (μυχῷ χθονὸς εὐρυοδείης). The wide-pathed ground was previously identified with Earth – but what of that curious ‘nook’ (μυχῷ)? It could be contended that this nook *precisely is* Tartarus’ brother, Chaos: Chaos emerged 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 reading confirms the conventional etymology of Chaos: scholars have often assumed that the name Chaos, which Hesiod invented, is closely related to the term χάσμα or ‘chasm’. [5] This interpretation has been controversial and this is not the occasion to address the challenges that have been raised against it. Still,

the interpretation of Chaos as ‘chasm’ or interval between determinate spaces receives support in another key passage of Hesiod’s *Theogony*, where the poet vividly reports the end of the Titanomachy:

T3. Hesiod, *Theogony* 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
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.

Οὐδ’ ἄρ’ ἔτι Ζεὺς ἴσχευ ἐὼν μένος, ἀλλὰ νῦ τοῦ γε
εἴθαρ μὲν μένεος πλῆντο φρένες, ἐκ δέ τε πᾶσαν
φαῖνε βίην· ἄμυδις δ’ ἄρ’ ἀπ’ οὐρανοῦ ἦδ’ ἀπ’ Ὀλύμπου
ἀστράπτων ἔστειχε συνωχᾶδόν, οἱ δὲ κεραυνοὶ 690
ἵκταρ ἅμα βροντῇ τε καὶ ἀστεροπῇ ποτέοντο
χειρὸς ἀπο στιβαρῆς, ἱερὴν φλόγα εἰλυφόωντες
ταρφέες. ἀμφὶ δὲ γαῖα φερέσβιος ἐσμαράγιζε
καιομένη, λάκε δ’ ἀμφὶ πυρὶ μεγάλ’ ἄσπετος ὕλη·
ἔζεε δὲ χθὼν πᾶσα καὶ Ὠκεανοῖο ῥέεθρα 695
πόντος τ’ ἀτρύγετος· τοὺς δ’ ἄμφεπε θερμὸς ἀντιμῆ
Τιτῆνας χθονίους, φλόξ δ’ ἠέρα διᾶν ἵκανε
ἄσπετος, ὅσσε δ’ ἄμερδε καὶ ἰφθίμων περ ἐόντων
αὐγὴ μαρμαίρουσα κεραυνοῦ τε στεροπῆς τε.
καῦμα δὲ θεσπέσιον κάτεχεν Χάος· εἷσατο δ’ ἅντα 700
ὀφθαλμοῖσιν ἰδεῖν ἦδ’ οὔασιν ὅσσαν ἀκοῦσαι
αὐτῶς ὥς ὅτε Γαῖα καὶ Οὐρανὸς εὐρὺς ὑπερθεν
πίλνατο· τοῖος γάρ κε μέγας ὑπὸ δοῦπος ὀρώρει
τῆς μὲν ἐρειπομένης, τοῦ δ’ ὑψόθεν ἐξεριπόντος.

Hesiod’s account of the din of war is emphatic and pronounced: he sought to convey the brutality of battle in the violence of sound. One is witness to nothing less than the perceived capitulation of the cosmos itself. Zeus advanced upon the lower world like an army marching forth without pause; his lightning shattered the ears and blinded 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 did 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.

At this point let us turn away from Chaos and focus on the second key term, *kosmos* (κόσμος), which generally means, when used in a cosmological context, ‘world order’ or ‘well-ordered world’. This section will start by discussing the emergence of a distinct concept of ‘world order’, indicated by the term *kosmos*, before turning to the gradual elaboration of this notion in the 5th century BCE. It is important to highlight at this point that 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 meant ‘world order’ in the sense of a universal system of reality. Rather, it just meant ‘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 [6]. Importantly, the term never means ‘world order’ in Homer or in Hesiod and in this sense, it is a bit misleading to speak, as done previously, of Hesiod’s cosmos. Instead, Hesiod used the term *πάς*, an adjective which just means ‘all’ (as it does in line 127 of the *Theogony*, where Hesiod spoke of Heaven fencing in ‘all’ of earth (περὶ πᾶσαν ἔεργον)). 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 recognised 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 by the term *kosmos*. Several figures were considered, but a consensus emerged that the first person to refer to the ordered Universe as *kosmos* was Pythagoras of Samos (c. 570 BCE – c. 490 BCE).

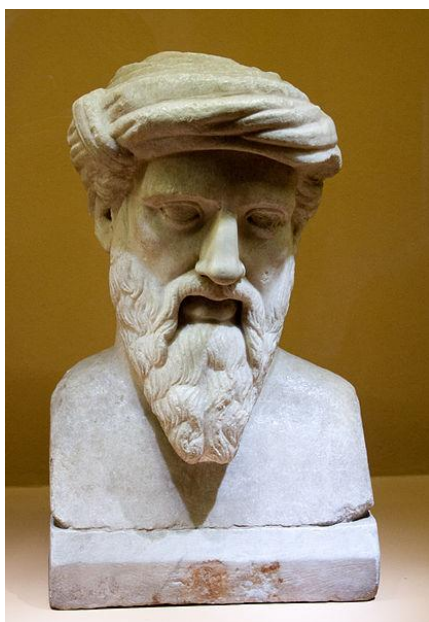


Figure 2. Portrait of Pythagoras from the Musei Capitolini, Rome, Roman copy of a Greek original from the 2nd-1st century BCE. Source: Wikimedia Commons.

Pythagoras was a philosopher – some in antiquity said that 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 (see figure 2). 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 mentioned in a work entitled *History of All Sorts* that:

T4: Favorinus Fragment 99 Amato = Diogenes Laertius 8.48

... 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.

Now at first glance Favorinus’ account seems quite straightforward, but there are some important implications to how he phrased his comment: he tells us that Pythagoras was first to refer to the heavens as *kosmos*, but the separate reference to earth as ‘round’ would imply that he did 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 it is not known 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:

T5: Anon. Phot. Bibl. Cod. 249.440a 27-9

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.

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 meant, they are adorned (κεκοσμηθῆναι) with all the living beings (here he probably meant 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. One 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 could be consulted 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 later Pythagoreans, especially the philosopher Philolaus of Croton (c. 470 – c. 385 BCE) [7]. A little bit is known 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 conducted a debate with Philolaus’ students Simmias and Cebes on the question of whether the soul is immortal.

It is generally agreed that Philolaus was 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, the emergence and transformation of the world and the structures that underpin the universal order. Philolaus additionally treated various philosophical and scientific aspects related to

these topics, including epistemology (with special interest in how one *can* know the principles of reality), astronomy (including the arrangement of what is now called 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’ (see figure 3).



Figure 3. Pythagoras and Philolaus from *Theorica musicae* by Franchino Gaffurio 1492. Source: Wikimedia Commons.

Philolaus’ book begins with this powerful statement about nature and *kosmos*:

T6: Philolaus DK 44 B 1 = D2 Laks & Most [8] = Diogenes Laertius 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.

ἡ φύσις δ’ ἐν τῷ κόσμῳ ἀρμόχθη ἐξ ἀπείρων τε καὶ περαινόντων καὶ ὅλος <ὁ> κόσμος καὶ τὰ ἐν αὐτῷ πάντα.

Scholars are at a loss to determine what the principal entities that make up the cosmos, the limiters and the unlimiteds really are (cf. Philolaus DK 44 B2 = D3 Laks & Most = Stob. *Ecl.* 1.21.7a). Some scholars have 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, the limiters are odd numbers and the unlimiteds are even numbers. But there is nothing in the two fragments to strongly support this reading either. Moreover, other fragments of Philolaus that discuss number imply that there is a strong connection between various species of number and the limiters and unlimiteds, but these fragments do not identify them.

In the context of the cosmological theory of Hesiod, I would like to advance a new hypothesis concerning Philolaus’ 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 was not totally innovating within the cosmogonic traditions of ancient Greece, as scholars often assume; instead, he adapted two principles he found in Hesiod, Earth and Heaven, but modified them through demythologisation in order to advance a novel cosmogonic theory freed from the accoutrement of divine genealogies.

This hypothesis of Philolaus' adaptation of Hesiod's cosmogonic account might sound plausible, at least with reference to Earth and Heaven, but what about the other cosmic deities of the first generation? One Hesiodic god for whom there is no difficulty in detecting a parallel in Philolaus' fragments is Eros. For in *On Nature*, Philolaus spoke of a force that comes upon the limiters and unlimiteds in just the way (as proposed above) Eros influences Heaven and Earth. That force is called 'harmony' (ἀρμονία):

T7: Philolaus DK 44 B 6 = D 5 Laks & Most = 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.

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 γινῶσιν, πλάν γὰρ ἢ ὅτι οὐχ οἶον τ' ἦν οὐθενὶ τῶν ἐόντων καὶ γιγνωσκομένων ὑφ' ἀμῶν γενέσθαι, μὴ ὑπαρχούσας τὰς ἐστοῦς τῶν πραγμάτων ἐξ ὧν συνέστα ὁ κόσμος καὶ τῶν περαινόντων καὶ τῶν ἀπείρων. ἐπεὶ δὲ ταὶ ἀρχαὶ ὑπάρχον οὐχ ὁμοῖαι οὐδ' ὁμόφυλοι ἔssαι, ἥδη ἀδύνατον ἦς κα αὐταῖς κοσμηθῆναι, εἰ μὴ ἀρμονία ἐπεγένετο ὧτινῶν ἂν τρόπῳ ἐγένετο. τὰ μὲν ὧν ὁμοῖα καὶ ὁμόφυλα ἀρμονίας οὐδὲν ἐπεδέοντο, τὰ δὲ ἀνόμοια μὴδὲ ὁμόφυλα μὴδὲ ῥιστοταχῆ† ἀνάγκα τὰ τοιαῦτα ἀρμονία συγκεκλειῖσθαι, εἰ μέλλοντι ἐν κόσμῳ κατέχεσθαι.

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.

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. Hesiod included two further entities among his original four: Chaos, who was identified with primordial gap or interval and Tartarus, who was identified with the obscurity of darkness. Neither of these two figures is in any straightforward way paralleled in Philolaus' account of the first principles. Moreover, Philolaus included another force, which is not easily associated with anything in Hesiod: he called it 'the being of things' (ἃ ἐστὼ τῶν πραγμάτων). Philolaus said very little about this and one is left to conjecture what it really is: one is told that it is eternal (which does not 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 B 6 (in T7) does give 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 : being of things :: harmony : nature. This appears to be chiasmic in structure: a : b :: b : a. Possibly the being of things is just 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 provisional conclusion about Philolaus: in so far as he was adapting the Hesiodic cosmogony, he seems to have excluded the forces that one way or another eventuated time and all the forces of discord in later generations: Chaos and Tartarus. If as speculated previously Pythagoras was a committed cosmic teleologist, this might have influenced Philolaus to exclude at least the dark force of Tartarus, but this would not help to explain the *apparent* exclusion of Chaos. Moreover, at first glance at least it would appear that Philolaus 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 desexualised. Still, as will now be argued, this does not imply that Philolaus rejected the biomorphic model of cosmogony. In another fragment, Philolaus tells us:

T8: Philolaus DK 44 B 7 = D 15 Laks & Most = Stob. *Ecl.* 1.21.8

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

τὸ πρῶτον ἄρμωσθέν, τὸ ἐν ἐν τῷ μέσῳ τῆς σφαίρας, ἐστία καλεῖται.

This fragment outlines the next step in Philolaus’ cosmogony. It reveals that for Philolaus the combination of limiters and unlimiteds motivated by harmony produced a sphere and the first individuated item in that sphere was 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 was called ‘the house of Zeus’, in the sense of Zeus’ home on Olympus (cf. Philolaus DK 44 A 16 = D19 Laks & Most = Aetius 2.7.7). So the fire at the centre of the cosmos – surrounded by the so-called ‘counter-Earth’, Earth, Moon, Sun, the five 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 seen from a testimony provided by Aristotle’s student Meno. This testimony, preserved only 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:

T9: Philolaus DK 44 A 27 = D25 Laks & Most = 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.

Φιλόλαος | δὲ ὁ Κροτ[ωνιά]της συνεστάναι φησὶν τὰ ἡμέ[τερα] σώμ[ατα] ἐκ] θερμοῦ. ἀμέτοχα γὰρ αὐτὰ εἶναι | ψυχροῦ, ὑπομ[ι]μνήσκων ἀπὸ τινων τοιούτων· τὸ σπέρμ[α] εἶναι θερμόν, κατασκευαστικὸν δὲ | τοῦτο τ[οῦ] ζῴου· καὶ ὁ τόπος δέ, εἰς ὃν | ἡ καταβολ[ή]— μήτρ]α δὲ αὕτη—ἐστὶν θερμότερα | καὶ ἐοικ[υ]ῖα ἐκ]εῖναι· τὸ δὲ ἐοικός τι τὰυτὸ δύναται ᾧ ἔοικεν· ἐπεὶ δὲ τὸ κατασκευάζ[ον] ἀμέ]τοχόν ἐστιν ψυχροῦ καὶ ὁ τόπος | δέ, ἐν ᾧ [ἡ καταβολ]ή, ἀμέτοχός ἐστιν ψυχροῦ, | δῆλον [ὅτι καὶ τὸ] κατασκευαζόμενον ζῶον |

τοιούτο[ν γίνε]ται. εἰς δὲ τούτου τὴν | κατασκ[εὺν ὑ]πομνήσει προσχρήται τοιαύτη· με[τὰ
γάρ], φησιν τὴν ἔκτεξιν εὐθέως | τὸ ζῶιον ἐπισπᾶται τὸ ἐκτὸς πνεῦμα | ψυχρὸν ὄν· εἴτα
πάλιν καθαπερὶ 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. |

This testimony, which is full of references to contemporary 5th century BCE medical theory (especially that of the Hippocratic doctors), helps to conceptualise how the cosmos goes from being a sphere composed of limiters and unlimiteds, brought into correspondence through harmony, to a living being. For like the creature 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 it breathes in the cold air from outside, thereby catalysing its internal arrangement and coming into life. Something similar must be imagined 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 confirmed this reading in his *Physics*:

T10: Aristotle, *Physics* 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.

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.

As Aristotle testified, 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 one is encouraged to speculate how the recurrence of this blending at every stage of the constitution of reality is observed. Hence, Philolaus produced 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, one can still speak of a 'biomorphic' model of cosmogony – and like Hesiod's cosmogony, where primary and secondary stages of cosmogonic development were distinguished, Philolaus also understood 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. It is understood then that this is a progression from cosmogony to cosmology.

There is one final consequence that emerges from Philolaus' cosmological account, which helps to situate it better in relation to Hesiod's *Theogony*: for the introduction of a notion of cosmic breathing unveils another element of Philolaus' cosmological system that had been hiding just beyond one's sight, namely, the notion of void. Philolaus' void, which is breathed in from outside the sphere, corresponds to Hesiod's Chaos, in so far as both indicate the spaces or intervals between things that provide regular order. Aristotle took 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, is also revealed to be fundamental to the persistence of repeatable order within the cosmos.



Figure 4. Hendrick Goltzius, Frontispiece to Ovid's *Metamorphoses* Book 1, 1589. Source: Wikimedia Commons.

As this paper comes to a close, let us return to Chaos once again for the reader might be wondering when precisely Chaos became a force associated with disorder.

The answer lies with the influential Roman poet Ovid (43 BCE – 17 CE), who writing in his epic poem *Metamorphoses* at the end of the 1st century BCE described the principles of reality and the primordial design of the Universe (see figure 4) in these terms:

T11: Ovid, *Metamorphoses* 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, Waves surging round gripped and bound the whole world.	30
Ante mare et terras et quod tegit omnia caelum 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, nec nova crescendo reparabat cornua Phoebe, nec circumfuso pendebat in aere tellus ponderibus librata suis, nec bracchia longo margine terrarum porrexerat Amphitrite; utque erat et tellus illic et pontus et aer, 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.	5 10 15 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 concordia pace ligavit: igneae 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; circumfluit umor ultima possedit solidumque coercuit orbem.	25 30

Only the part of Ovid's *Metamorphoses* that describes the pre-cosmic state as Chaos has been provided; what follows the separation of reality into its elemental constituents are the divine commandments of God, which carry out his desire for a beautiful world. Now scholars have noticed Ovid's 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 scholars have not really considered is the importance of Ovid's choice of cosmogonic mode for his presentation. For Ovid's mode of cosmogony is distinctly 'technomorphic' in the sense that it is by virtue of God's 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 skilful artistic god, in his aim to articulate the Universe according to principles of order and sometimes in his own image. If this is right, it might be asked 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.

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- [4] Sedley D N 2009 Hesiod's *Theogony* and Plato's *Timaeus*. In G R Boys-Stones and J H Haubold eds. *Plato and Hesiod* (Cambridge) pp 253–5
- [5] For a good discussion, see Mondi R 1989 Χάος and the Hesiodic Cosmogony *Harvard Studies in Classical Philology* **92** 1–41
- [6] Horky P S 2019 When did *Kosmos* become the *Kosmos*?. In P S Horky ed. *Cosmos in the Ancient World* (Cambridge) pp 22–41
- [7] In general, for Philolaus' life, texts, and philosophy see C Huffman ed. 1993 *Philolaus of Croton: Pythagorean and Presocratic* (Cambridge). The translations of Philolaus here are sometimes adapted from Huffman's translations.
- [8] “DK” is a standard abbreviation for “Diels-Kranz”, i.e., H Diels and W Kranz eds. 1952 *Die Fragmente der Vorsokratiker* 6th edition (Berlin).
“Laks & Most” stands for A Laks and G Most eds. 2016 *Early Greek Philosophy, Volume IV: Western Greek Thinkers, Part 1* (Cambridge, MA)