Plotinus’ Cosmology
A Study of *Ennead* II.1 (40)

Text, Translation, and Commentary

JAMES WILBERDING

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PLOTINUS’ COSMOLOGY
A STUDY OF ENNEAD II.1 (40)
This book is a revised version of a University of Chicago doctoral dissertation submitted in 2002. I came to the topic through a reading group led by Ian Mueller which began as a reading group on Plato’s *Timaeus* but then developed into a reading group on Aristotle’s *De caelo* before we finally turned our sights on Simplicius’ commentary on the *De caelo*. Perhaps unsurprisingly, I decided that I would understand Simplicius better by simultaneously studying what Plotinus had to say about cosmology, and although this started as a short excursion on a topic of interest, it quickly grew into a full-scale dissertation project. When I began this project there was no commentary devoted entirely to *Ennead* II.1, but that changed with the appearance of R. Durfour’s French commentary in 2003. Yet, since the penultimate version of this study was complete by the time Dufour’s book was available, it was only in the final revisions that I was able to take his work into account. (For a brief discussion of the differences between our approaches to *Ennead* II.1, see my review in *Archiv für Geschichte der Philosophie* 86 (2004), 322–9.)

While writing this book I accumulated a number of academic debts which I would like to acknowledge here. Liz Asmis, Rachel Barney, Christoph Horn, David Rehm, and Richard Sorabji all read the typescript either in part or in whole and provided valuable comments, advice, and support. I also profited from several conversations I had with Stephen Menn over the years. Wayne Hammond helped me find the images for the cover, and Jay Pasachoff kindly gave me permission to use those images. Special thanks should go, of course, to Ian Mueller whose reading group led me to this project and who oversaw it from its inception.
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<td>Acad.</td>
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<td>AP</td>
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<td>APo</td>
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<td>AN</td>
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<td>Cat.</td>
<td>Aristotle, <em>Categories</em></td>
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<td>Caus. plant.</td>
<td>Theophrastus, <em>De causis plantarum</em></td>
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<td>Chald. Orac.</td>
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<td>Crat.</td>
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<td>De Mel.</td>
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<td>De myst.</td>
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<td>De Plat.</td>
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<td>DI</td>
<td>Theophrastus, <em>De igne</em></td>
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<td>Didask.</td>
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<td>[Aristotle], <em>De mundo</em></td>
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<td>DP</td>
<td>Aristotle, <em>De philosophia</em></td>
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<td>DS (Arist.)</td>
<td>Aristotle, <em>De sensu</em></td>
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<td>DS (Theoph.)</td>
<td>Theophrastus, <em>De sensu</em></td>
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<td>Elem.</td>
<td>Euclid, <em>Elements</em></td>
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<td>E–K</td>
<td>Edelstein and Kidd, <em>Poseidonius</em></td>
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<td>Epin.</td>
<td>[Plato], <em>Epinomis</em></td>
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<td>GA</td>
<td>Aristotle, <em>De generatione animalium</em></td>
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<tr>
<td>GC</td>
<td>Aristotle, <em>De generatione et corruptione</em></td>
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Abbreviations

Gorg. Plato, Gorgias
H–S P. Henry and H.-R. Schwyzer’s editions of Plotinus
Hist. plant. Theophrastus, Historia plantarum
Hyp. astr. Proclus, Hypothesis astronomicarum positionum
IA Aristotle, De inessu animalium
In Alc. Proclus, Commentary on Plato’s Alcibiades
In Cat. (Phil.) Philoponus, Commentary on Aristotle’s Categories
In Cat. (Porph.) Porphyry, Commentary on Aristotle’s Categories
In Cat. (Simp.) Simplicius, Commentary on Aristotle’s Categories
In Crat. Proclus, Commentary on Plato’s Cratylus
In DA (Alex.) Alexander, Commentary on Aristotle’s De anima
In DA (Phil.) Philoponus, Commentary on Aristotle’s De anima
In DC Simplicius, Commentary on Aristotle’s De caelo
In DS Alexander, Commentary on Aristotle’s De sensu
In GA Michael of Ephesus, Commentary on Aristotle’s De generatione et corruptione animalium
In GC Philoponus, Commentary on Aristotle’s De generatione et corruptione animalium
In Gorg. Olympiodorus, Commentary on Plato’s Gorgias
In Meta. (Alex.) Alexander, Commentary on Aristotle’s Metaphysics
In Meta. (Syr.) Syrianus, Commentary on Aristotle’s Metaphysics
In Meteo. (Alex.) Alexander, Commentary on Aristotle’s Meteorology
In Meteo. (Olym.) Olympiodorus, Commentary on Aristotle’s Meteorology
In Meteo. (Phil.) Philoponus, Commentary on Aristotle’s Meteorology
In Parm. (Dam.) Damascius, Commentary on Plato’s Parmenides
In Phaed. Damascius, Commentary on Plato’s Phaedo
In Phaedr. Hermias, Commentary on Plato’s Phaedrus
In Phys. (Phil.) Philoponus, Commentary on Aristotle’s Physics
In Phys. (Simp.) Simplicius, Commentary on Aristotle’s Physics
In Remp. Proclus, Commentary on Plato’s Republic
In Tim. (Chalc.) Chalcidius, Commentary on Plato’s Timaeus
In Tim. (Porph.) Porphyry, Commentary on Plato’s Timaeus
In Tim. (Proc.) Proclus, Commentary on Plato’s Timaeus
In Top. Alexander, Commentary on Aristotle’s Topics
Incor. qual. Galen, Quod qualitates incorporeae sint
K-G Raphael Kühner and Berhard Gerth, Ausführliche Grammatik der griechischen Sprache
LSJ H. G. Liddell, R. Scott, and H. Stuart Jones, Greek–English Lexicon
MA Aristotle, De motu animalium
Mant. [Alexander], De anima libri mantissa (= De anima liber alter)
Mem. Xenophon, Memorabilia
Abbreviations

Meta. Aristotle, *Metaphysics*
Meteo. Aristotle, *Meteorology*
Mor. Plutarch, *Moralia*
Nat. hom. Nemesius, *De natura hominis*
Nat. mundi. Timaeus Locrus, *On the Nature of the World and the Soul*
Nat. quaest. Seneca, *Quaestiones naturales*
ND (Cic.) Cicero, *De natura deorum*
ND (Corn.) Cornutus, *De natura deorum*
Opif. mundi Philo, *De opificio mundi*
Out. Pyrr. Sextus Empiricus, *Outlines of Pyrrhonism*
PA Aristotle, *De partibus animalium*
Para. DA (Them.) Themistius, *Paraphrase of Aristotle’s De anima*
Para. DA (Soph.) Sophonias, *Paraphrase of Aristotle’s De anima*
Phaed. Plato, *Phaedo*
Phaedr. Plato, *Phaedrus*
Phil. Plato, *Philebus*
Phys. Aristotle, *Physics*
PS Alexander, *Problems and Solutions*
Refut. Hippolytus, *Refutatio omnium haeresium*
Rep. Plato, *Republic*
Sent. intell. Porphyry, *Sententiae ad intelligibilia ducentes*
Soph. Plato, *Sophist*
Stat. Plato, *Statesman*
Strom. Clement, *Stromateis*
Symp. Plato, *Symposium*
SVF *Stoicorum Veterum Fragmenta*
Th. Theiler, *Poseidonius. Die Fragmenten*
Theaet. Plato, *Theaetetus*
Theol. arith. Iamblichus, *Theologoumena arithmeticae*
Tim. Plato, *Timaeus*
Top. Aristotle, *Topics*
VP Porphyry, *Life of Plotinus*
Deviations from H–S

The Greek text is reprinted from the most recently edited version of text, H–S^5, which is in effect H–S^2 revised according to the emendations suggested in H–S^3-5 (see bibliography). In ii.1 H–S^5 differs from H–S^4 (the text contained on the TLG) in only two places: H–S^5 has κατὰ for καὶ at 1.36 and σῶμα τε for σώματα at 2.9. I deviate from H–S^5 in the following passages:

<table>
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<td>7.7–8 πρὸς τὸ μὴ αὐχμηρὸν [ἔχει δὲ] καὶ</td>
<td>πρὸς τὸ (τὸ) μὴ αὐχμηρὸν ἔχειν τε καὶ (τὸ et τε scripsi, ἔχειν H–S^5)</td>
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Introduction

CONTEXT OF THE TREATISE

Our concern here is with Plotinus' treatise *On the Universe* (*Ennead* II.1) in which he argues for the everlastingness of the universe, the heavens and the heavenly bodies. In his *Life of Plotinus* (*VP*), Porphyry furnishes an account of the originative sequence of Plotinus' writings according to which our treatise is the fortieth. He also divided them into three groups according to three stages of his own association with Plotinus. The first group of 21 treatises had already been written down prior to Porphyry's arrival in Rome, and is characterized by Porphyry as being 'of a lesser capacity, not yet attaining to the dimensions of his full vigour'.\(^1\)

The second group encompasses the 24 treatises that Plotinus composed during Porphyry's stay in Rome which 'display the pinnacle of his competence', being 'fully consummate'.\(^2\) Finally, Porphyry thinks that the last group of nine, written after he had left Plotinus for Sicily, exhibit 'a dwindling ability' on Plotinus' part.\(^3\) This means that, if Porphyry's assessment of the Plotinian corpus is accurate, we should expect our treatise *On the Universe* to be a careful and well examined account of the heavens. Indeed, Plotinus' approach to cosmology in *On the Universe* offers such a stark contrast to that of the much earlier *On the Motion of the Heavens* (chronologically 14) that these two treatises could at first glance serve as the paradigmatic examples of Porphyry's claim, even though on the whole Porphyry's evaluation misses the mark.\(^4\) *On the Motion of the Heavens* is a very short treatise written in a dialectical style which many commentators have labelled obscure and provisional.\(^5\) *On the Universe*,

\(^1\) 6.30–2, Armstrong's translation.
\(^2\) 6.32–4.
\(^3\) 6.34–7.

\(^4\) The inaccuracy of Porphyry's appraisal is widely recognized by scholars. See e.g. Schwyzer (1951: 484.14–44).

\(^5\) Bréhier (1924–38: vol. 2, 17) remarks that 'La marche de sa pensée est assez compliquée et obscure.' Harder (1956–71: vol. 1b, 535) notes: 'Das Stückchen, in dem manches dunkel bleibt, [...], ist kaum zum Vortrag bestimmt gewesen. Die Problemata-Form beherrscht den ersten Teil und läßt allen möglichen Erwägungen Raum, ob sie nun plotinisch sind oder nicht.'
by contrast, is nearly three times as long and employs a much clearer argumentative method. Nevertheless, it would be wrong to attribute these stylistic differences to some dubious discrepancy in Plotinus’ philosophical ability. While it is true that a good part of On the Motions of the Heavens is written in a dialectical style marked by an ambiguity in voice which gives rise to many uncertainties, not all of the treatise is written in this way; the third chapter presents a clear exposition of Plato’s Timaeus 36e. And Plotinus regularly makes use of this same dialectical style in his ‘middle’ period as well.⁶ At least some of the imprecision is due to the fact that at the time of its composition only a small group of students had access to the treatise, and they could be expected to make sense of it on their own, presumably either by recalling Plotinus’ lectures on the material or by making informed exegetical decisions based on the knowledge of the rest of Plotinus’ system.⁷ Finally, as will become clear below, the views expounded in each of these treatises are largely compatible, and it is hard to believe that a Plotinus ‘of a lesser capacity’ could just happen to hit upon a celestial theory that he then later, having achieved his full philosophical acumen, discerned to be suitable. Thus, it is best to disregard Porphyry’s biases and to understand the chronological difference simply as serving to affirm the persistence of Plotinus’ interest in cosmology.

The designation II.1 is due to Porphyry’s own classification of Plotinus’ writings into six Enneads, that is, six sets of nine treatises. By placing this treatise in the second Ennead, Porphyry categorizes it as ‘natural philosophy’,⁸ but while as far as classifications go this is the most reasonable category for the treatise, it is not completely satisfactory. As Plotinus did not write systematically, his expositions cannot be neatly divided into distinct branches of philosophy. Thus, here as elsewhere in the second Ennead, theories on natural philosophy are interwoven with meditations on ethics, metaphysics, and psychology. This being said, the centrality of natural philosophy to our treatise is unmistakable; it examines natural motion and is engaged in squaring the apparent rectilinear motions of the elements with the circular motions of the heavens. For this reason, we shall follow Porphyry in calling this a treatise on natural philosophy, but we should remain wary of Porphyry’s evaluative assessment of it. By ordering natural philosophy into the second Ennead, Porphyry is pronouncing his opinion that this treatise deals with relatively ‘less difficult questions’.⁹

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⁹ VP 24.14–16. Porphyry is referring to the order of the Enneads themselves and not to
Perhaps Porphyry envisioned natural philosophy as preliminary to the true metaphysics of the hypostases. If so, he could appeal to some texts in Plato and Aristotle for support. Plato clearly pedagogically subordinated astronomy to higher pursuits in the Republic, and Aristotle also ordered natural philosophy beneath first philosophy. However, even Plato and Aristotle would stop short of saying that the value of studying cosmology is purely instrumental. If one takes Aristotle’s Metaphysics Λ as his treatment of first philosophy, then there will be a great overlap between first philosophy and the study of celestial motion. Likewise, even in Plato’s Republic, where there is a clear subordination of astronomy, astronomy is no lowly science concerned with the physical world; its subject is the intelligible world, and its truths are unchanging. Elsewhere in the Platonic corpus the study of the heavens is accorded even greater prestige. In the Epinomis, for example, astronomy seems to have usurped dialectic which is only briefly mentioned after a lengthy account of the mathematical sciences. Furthermore, in the Timaeus the study of cosmology is said to have a therapeutic effect on our souls, conforming the motions of our minds to those of the World-Soul. In Plotinus we should expect the study of cosmology to retain much of this prominence and purpose.

Modern readers should, of course, count on other dividends. Surely, we should not look to Neoplatonic natural philosophy to replace our existing scientific theories, but it is nevertheless possible to learn from an investigation of Plotinus’ cosmology. Plotinus scholars have much to gain from a careful study of this treatise which has been consistently the order of the treatises within an Ennead, cf. Harder Vc, 122 and the note by Luc Brisson and Alain-Philippe Segonds in Brisson, et al. (1992).

10 521cff.
11 Meta. 982b24ff. and 1026a18–23.
12 As opposed to taking Meta. Z-H as such.
15 The Epin. is probably spurious (see Tarán 1975), but it does contain some solid Platonic doctrine and was taken by Plotinus to be genuine. See below, pp. 14–15.
16 Epin. 989c1–991d1. Cf. Festugière (1950–4): ‘Et comme l’auteur s’est efforcé sur-tout, dans le dialogue, de nous montrer que le Dieu Ciel et les astres ont droit à notre principale adoration, on peut penser que le Ciel et les astres constituent à ses yeux l’objet premier de la contemplation. Il est sûr, en tout cas, que la philosophie hellénistique s’est arrêtée à ce terme’ (2.215), and ‘Dès lors, la vue du Ciel est réellement très propre à unifier l’esprit qui le contemple’ (2.217); and Des Places: ‘Arithmétique, géométrie, stéréométrie, harmonique ne sont que des préparations à l’astronomie, laquelle s’identifie avec la sagesse et la piété’ (1956: 123).
17 Tim. 47b6–c4.
neglected in the Plotinus scholarship of the past two centuries. Scientific theory presents a setting where metaphysical speculations become concrete, where visible roles are conferred on ontological entities, where philosophical traditions and assumptions must, at least in some measure, bow to empirical observation. Here it is possible to see a philosophical system in action. Thus, the substances that form the core of Plotinus’ metaphysics, like the World-Soul and Intellect, are found here as well, in roles that serve to illuminate both their own natures and their relation to us.

## PLOTINUS’ BACKGROUND IN COSMOLOGY

The prominent position that the study of heavenly motion has received in the Platonic-Aristotelian tradition and the fact that Plotinus’ own interest in cosmology seems to have spanned many years prompt one to ask how much background Plotinus actually had in the subject. Porphyry tells us only this:

Plotinus devoted himself both to the tables (κανόνες) concerning the stars (ἀστέρες), although not particularly μαθηματικῶς, and more painstakingly to the astrological works of those who cast horoscopes. And once he discovered that this pursuit is without foundation, he did not hesitate to refute their writings on many grounds. (15.21–6)

κανῶν clearly has the technical meaning of ‘table’ in astronomy and astrology, as Ptolemy’s Handy Tables (προχείρων κανόνων διάταξις καὶ ψηφοφορία) attests. This work consists of a series of tables on several subjects: chronology (lists of kings, etc.), geography (distances between cities, etc.), and celestial phenomena. This last group contains tables concerning the sun, the moon, the planets, the (fixed) stars, and eclipses.

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18 Zeller’s attitude seems representative: ‘Auf diesem Standpunkt mußte ihm notwendig für eine Erforschung der physikalischen Gesetze ebenso der Sinn wie die Fähigkeit abgehen. Seine Schriften bieten daher nur weniges . . .’ (1855–65: 3.2, 619). While some general overviews on Plotinus make some small mention of II.1, most completely ignore this part of his philosophy. The former includes Schwzyzer (1951), Zeller, Beutler–Teiler’s overview (1956–71: vol. vi). The latter includes Bréhier (1968), Gerson (1994) and (1996), Rist (1967). Inge (1923) devotes a little over a page to cosmology but complains that ‘on the whole the chapters that deal with cosmology are among the least valuable in the Enneads’ (i. 188). The Penguin edition of the Enneads (trans. MacKenna; ed. and abr. Dillon) does not include ii.1. For an example of how the study of Plotinus’ cosmology can help us to understand his metaphysics, see Wilberding (2005).

19 Thus, Armstrong’s ‘the rules of astronomy’ seems infelicitous.
Thus, since the Greek word ἀστήρ refers not only to what we call stars but also to the sun, the moon, and the planets (the ‘wandering’ stars) it is reasonable to take Porphyry to be referring to tables of the movements of all the heavenly bodies. The sense of Porphyry’s qualification ‘but not particularly μαθηματικῶς’ is captured well by the gloss suggested by Alain-Philippe Segonds—‘but not like an astronomer’, since the Greek word μαθηματικός often has the meaning ‘astronomical’. This suggests that Plotinus did not really look at the figures or calculations involved in the tables and probably did not try to comprehend all aspects of the theory behind the tables.

To this extent, Plotinus’ approach is not all that different from Aristotle’s, who also theorized about the heavens while leaving certain technical questions to the ‘mathematicians’. As Porphyry would have it, this lax approach to his study of the tables is not due to a lack of mathematical ability but seemingly to a lack of interest. For as Porphyry (rather hagiographically) recounts, ‘neither the so-called geometrical theory nor the arithmetical, nor mechanics, optics or music escaped his attention.’

We can be certain that Plotinus was very well-versed in both Plato’s and Aristotle’s cosmological accounts. Further, we are told that Plotinus was familiar with the works of many post-Aristotelian thinkers including Severus, Cronius, Numenius, Gaius, Atticus, Aspasius, Alexander and Adrastus, as well as with Stoic doctrine, and so it is probable that Plotinus was acquainted with at least some of the cosmological theories of these thinkers. Some evidence also suggests that he was familiar with Ptolemy’s work. But clearly it was Platonic, Aristotelian, and Stoic

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20 This is in agreement with A-P Segonds’ interpretation of the passage in Brisson et al. (1992). Segonds is right to point out that Harder’s ‘Gestirnkatalog’ inaccurately limits the contents of the tables to the fixed stars. Ptolemy’s Handy Tables makes clear that the scope of these tables is probably much wider, although it certainly does include the fixed stars, as Plutarch’s Mor. 974f shows.
21 See LSJ μαθηματικός II.2. The sense of μαθηματικῶς here might also be close to that at Meta. 995a6 where speaking μαθηματικῶς is contrasted with giving examples and citing poets; it seems to mean a rigorous argumentative method of elucidating on any topic (not just mathematics and astronomy). This, too, would suggest a lack of scientific rigour on Plotinus’ part.
22 DC 291b8–10; Meta. 1073b10–13, 1074a16–17.
23 VP 14.7–9.
25 VP 14.5.
26 At Π.1.5–6 Plotinus is clearly discussing a particular astrologer’s work (cf. οὗτος at Π.1.5.16). This might be Ptolemy, as Boll suggests (Jahrbuch für classische Philologie, Suppl. 21 (1894), 234 n. 2). In any case, Plotinus seems to be familiar with some astronomical vocabulary, e.g. ἀπορροή at Π.3.2.7 (cf. Ptolemy, Tetrabiblos 4.19) and Ptolemy’s distinction between δηλουτικόν and ποιητικόν (cf. Π.3.14.4 and Tetrabiblos 108.21).
cosmology that most strongly influenced Plotinus’ own cosmological theory. Indeed, their influence is so strong that it is difficult to understand Plotinus’ cosmology without first looking into these theories. For this reason I shall go through some of the more important features of these schools’ cosmological theories before advancing to a discussion of Plotinus.

**Plato’s Cosmological Theory**

An understanding of Plato’s cosmology is essential to an appreciation of Plotinus’ contribution to the subject. The bulk of Plato’s natural philosophy is to be found in the *Timaeus*, which furnishes us with a structured basis from which we can survey Plato’s natural philosophy in its entirety, bringing in other dialogues as necessary to unfold certain heterogeneous features of his thought, as well as to corroborate the findings from the *Timaeus*.

**The Generation and Structure of the Universe**

At the roots of Timaeus’ account is the distinction between what comes to be and what always is. The former includes the sensible things (these are grasped by perception and are the object of opinion) and the latter includes the intelligible things (grasped by intellect and the object of knowledge). Thus, since the cosmos is perceptible, it belongs to the former group and must be begotten, and the *Timaeus* offers an account of its creation. Despite this avowal that the cosmos must be generated and despite the fact that we are presented with an account of its generation, Plato does not in my view and in that of many ancient commentators really endorse a temporal beginning to the orderly universe.27 This is controversial but can be inferred from the text. For this inference, it *is not* sufficient to appeal to 37d3–7. Here we are told that ‘the nature of the living thing [viz. the intelligible universe] happens to be eternal’, and that since the sensible universe is begotten and accordingly cannot be eternal,

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27 Almost all ancient readers understood the *Tim* in this way, including Plotinus (cf. note to ii.1.1.1) and Xenocrates, the second head of the Academy after Plato and Speusippus. Proclus only names Atticus and Plutarch as reading the *Tim* as a temporal creationist account of the cosmos (*In Tim.* 1.276.30f), but Aristotle’s name should also be added to that list. Baltes discusses Atticus and Plutarch as well as some of their followers who also held that the world came to be in time in (1976: 38–69). Later Christian thinkers like Philoponus were, of course, also likely to read it this way (*AP, passim*). Cf. Taylor (1928: 66ff.).
it must settle for the image of eternity—everlastingness in time. This passage at most establishes that there was never a time when the universe did not exist, but we are told that time began with the universe. Rather, the beginninglessness of the universe is to be inferred from the conceptual difficulties that arise when one tries to understand the account temporally. In the precosmic state of disorder, for example, matter is said to be visible, but this should be impossible since Timaeus insists that nothing is visible without fire and fire does not yet exist in the precosmic state. Likewise, there is motion in the precosmic state, even though the principle of motion, soul, has yet to be created. Moreover, the atemporal order of the account itself points in this direction. The Demiurge first makes the body and then the soul, but we are told that the body was not in fact created prior to the soul. For all of these reasons it is best to take the genetic character of this account to be for didactic purposes—just as one must draw one part of a diagram after another even though no part of the real mathematical figure has any temporal priority over any other part.

In the Timaeus we are presented with a cast of roughly four: the things that always are and never come to be (the Forms), space (a receptacle for the Forms), the things that come to be and never are (the sensible things which result when the Forms are received by space), and the Demiurge. The description of the precosmic state is somewhat peculiar. One would expect a state in which space stands bare of any contact with the Forms and is thus utterly blank; a state in which space, the Demiurge, and the Forms exist in indifferent isolation from one another. What one gets is quite different. A sort of chaos is described, a disorderly state containing traces of the four elements. These traces are moved by a discordant shaking which causes the large and dense traces (presumably the earth and water traces) to separate from the rare and light traces (the air and fire traces), allotting to each kind its own place. Since we are also told that this same chaotic shaking is responsible for the present cosmic arrangement of the

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28 30a3–5. 29 31b. 30 30a3–5.
31 This led some commentators including Plutarch to posit a disorderly or irrational soul governing over the precosmic state.
32 31b ff.
33 34b10–35a1.
34 Cf. Aristotle, DC 280r1. Plotinus also reads the Timaeus in this manner, cf. iv.8.4.40–2.
35 52a8 ff. See Taylor (1928: 312).
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elements,\textsuperscript{37} we can gather that the precosmic arrangement of element-traces is similar to the cosmic arrangement: four concentric strata\textsuperscript{38} with earth at the centre,\textsuperscript{39} followed by water and air,\textsuperscript{40} with the final stratum being filled by fire.\textsuperscript{41} Thus, the precosmic universe would seem already to have the approximate shape of a sphere. So, when the Demiurge is said to give it a spherical shape,\textsuperscript{42} he must only be perfecting the irregular precosmic sphere, just as he perfects the element-traces by giving them the perfect geometrical shapes.\textsuperscript{43} In short, the receptacle in this precosmic state is already informed by qualities and motion, and sensible things already exist; but it is left unclear whether the Forms play any causal role here or whether space is charged in some other way.

The Demiurge is dissatisfied by this precosmic state since by virtue of his own goodness he wants everything to be as good as possible, but the precosmic state falls short of being good both because it is discordant and because it is inanimate and unintelligent.\textsuperscript{44} For this reason, the Demiurge resolves to make the contents of the precosmic state into an intelligent living thing, and he does so by modelling it after the Form of Living Thing.\textsuperscript{45} Since a living thing that comes to be (unlike the Form of Living Thing which always is) must have a body and a soul,\textsuperscript{46} the Demiurge begins to produce each of these. And in both processes of fabrication an attention to what has been called ‘mathematical chemistry’\textsuperscript{47} emerges, a feature which reveals the importance for Plato of fastening the sensible world into an intelligible framework; mathematics seems to function here, as it perhaps also does in the Republic,\textsuperscript{48} as a mediator between the sensible and intelligible worlds.\textsuperscript{49}

In a passage which is extremely difficult to interpret, Timaeus describes

\textsuperscript{37} 57c2–6.
\textsuperscript{38} As Cornford remarks, this arrangement ‘is no doubt assumed as an obvious fact’ (1937: 246). And cf. Taylor’s description of the precosmic state as ‘four great layers, in distinct regions of space’ (1928: 390).
\textsuperscript{39} 62d12–63a1.
\textsuperscript{40} 60b8–c1, 63b6.
\textsuperscript{41} 63b2 ff.
\textsuperscript{42} 33b1–c1.
\textsuperscript{43} Tim. 53a ff. See below (p. 10 ff.).
\textsuperscript{44} 30a2–c1.
\textsuperscript{45} 28a6–b2, 29a4–b1, 30c4–31a1. Cf. Phil. 28d ff.
\textsuperscript{46} 31b4 and 34b10–35a1.
\textsuperscript{47} Ian Mueller (1996), but note I am widening the scope of the term here to include not just the triangles but also the harmonic divisions of the World-Soul.
\textsuperscript{48} If mathematical objects are indeed meant to be the sole objects of diasnia at 510c–511a.
\textsuperscript{49} In Plotinus’ account this mathematical aspect is in part criticized, in part simply absent (see note on 6.12 (b)(i)).