

Acknowledgements

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In spite of the painstaking work of my research assistants and the expertise of those who have helped me there are doubtless places where I've gotten Proclus wrong, or failed to say all that needed to be said in the notes. These aspects of the translation and commentary I can claim as solely mine – and doubtless the persons just named will be perfectly willing to cede me full credit for them too!

My warmest thanks, however, are reserved for my wife, Elaine Miller, who has endured the gestation of this book with good grace. I suspect that I would not have liked Proclus much as a human being. I don't fancy the thought of a pint at the celestial pub if our respites from reincarnation should happen to coincide. His ontology is out of this world, his syntax often inscrutable, and his ear for Plato's

humor and playfulness is tin. Yet for all that, he's critically important to the philosophy of late antiquity. Elaine has patiently endured close companionship with a reluctant – and thus frequently irascible – initiate to the mysteries of neoplatonism. She loves me even when I am utterly unlovable, and for that I love her.

Notes on the Translation

In this translation we have sought to render Proclus' text in a form that pays attention to contemporary ways of discussing and translating ancient philosophy, while trying to present the content as clearly as possible, and without misrepresenting what has been said or importing too much interpretation directly into the translation. We have not sought to reproduce Proclus' sentence structure where this seemed to us to create a barrier to smooth reading, for which reason line and page numbers will involve a degree of imprecision. We have found the French translation by A. J. Festugière an invaluable starting-point, and it is still a useful and largely faithful rendition of Proclus' Greek.¹ However, we consider it worthwhile to try to make the philosophical content and arguments of Proclus' text as plain as possible. Something of our intentions can be deduced from the translation and commentary that Tarrant produced cooperatively with Robin Jackson and Kim Lycos on Olympiodorus' *Commentary on the Gorgias*.²

We believe that the philosophy of late antiquity now stands where Hellenistic philosophy did in the early 1970s. It is, at least for the anglo-analytic tradition in the history of philosophy, the new unexplored territory.³ The most impressive contribution to studies in this area in the past fifteen years has been the massive effort, coordinated by Richard Sorabji, to translate large portions of the *Greek Commentators on Aristotle*.⁴ R. M. van den Berg has provided us with Proclus' *Hymns*, while John

¹ Festugière, (1966-68). We are enormously indebted to Festugière's fine work, even if we have somewhat different aims and emphases. Our notes on the text are not intended to engage so regularly with the text of the *Chaldean Oracles*, the *Orphic Fragments*, or the history of religion. We have preferred to comment on those features of Proclus' text that place it in the commentary tradition.

² Jackson et al. (1998).

³ To be sure, some of the seminal texts for the study of Neoplatonism have been available for some time. These include: Dillon (1973), Dodds (1963), Neill (1965), Morrow (1970), Morrow and Dillon (1987). There are also the translations by Thomas Taylor (1758–1835). While these constitute a considerable achievement, given the manuscripts from which Taylor was working and the rate at which he completed them, they cannot compare well with modern scholarly editions.

⁴ The *Ancient Commentators on Aristotle* (Duckworth and Cornell University Press). The first volume in the series, Christian Wildberg's translation of Philoponus' *Against Aristotle on the Eternity of the*

Finamore and John Dillon have made Iamblichus' *de Anima* available in English.⁵ Sorabji's Commentators series now includes an English translation of Proclus' essay on the existence of evil.⁶ There is also a new edition of Proclus' eighteen arguments for the eternity of the world.⁷ We hope that our efforts will add something to this foundation for the study of late antiquity. If we have resolved ambiguities in Proclus' text without consideration of all the possibilities, or failed to note the connections between a particular passage in the *Timaeus* commentary and another elsewhere, then we can only plead that our team is working to begin the conversation, not to provide the final word.

In all five volumes in this series, the text used is that of Diehl. Deviations from that text are recorded in the footnotes. On the whole, where there are not philological matters at issue, we have used transliterated forms of Greek words in order to make philosophical points available to an audience with limited or no knowledge of Greek.

Neoplatonism has a rich technical vocabulary that draws somewhat scholastic distinctions between, say, intelligible (*noētos*) and intellectual (*noeros*) entities. To understand neoplatonic philosophy it is necessary to have some grasp of these terms and their semantic associations, and there is no other way to do this than to observe how they are used. We mark some of the uses of these technical terms in the translation itself by giving the transliterated forms in parantheses. On the whole, we do this by giving the most common form of the word – that is, the nominative singular for nouns and the infinitive for verbs – even where this corresponds to a Greek noun in the translated text that may be in the dative or a finite verb form. This allows the utterly Greek-less reader to readily recognise occurrences of the same term, regardless of the form used in the specific context at hand. We have deviated from this practice where it is a specific form of the word that constitutes the technical term – for

World, appeared in 1987. There are a projected 60 volumes including works from Alexander Aphrodisias, Themistius, Porphyry, Ammonius, Philoponus and Simplicius.

⁵ van den Berg (2001), Finamore and Dillon (2002). Other important, but somewhat less recent, additions to editions and modern language translations of key neoplatonic texts include: Segonds (1985-6) and the completion of the *Platonic Theology*, Saffrey and Westerink (1968-97).

⁶ Opsomer and Steel (2003).

⁷ Lang and Marco (2001). Cf. the first translation of the reply to Proclus by the Christian neoplatonist, Philoponus, Share (2005) and Share (2005).

example, the passive participle of *metechein* for ‘the participated’ (*to metechomenon*) or comparative forms such as ‘most complete’ (*teleôtaton*). We have also made exceptions for technical terms using prepositions (e.g. *kat’ aitian*, *kath’ hyparxin*) and for adverbs that are terms of art for the Neoplatonists. (e.g. *protôs*, *physikôs*). This policy is sure to leave everyone a little unhappy. Readers of Greek will find it jarring to read ‘the soul’s vehicles (*ochêma*)’ where ‘vehicles’ is in the plural and is followed by a singular form of the Greek noun. Equally, Greek-less readers are liable to be puzzled by the differences between *metechein* and *metechomenon* or between *protôs* and *protos*. But policies that leave all parties a bit unhappy are often the best compromises. In any event, all students of the *Timaeus* will remember that a generated object such as a book is always a compromise between Reason and Necessity.

We use a similar system of transliteration to that adopted by the Ancient Commentators on Aristotle series. The salient points may be summarised as follows. We use the diaeresis for internal breathing, so that ‘immaterial’ is rendered *aïilos*, not *ahulos*. We also use the diaeresis to indicate where a second vowel represents a new vowel sound, e.g. *aïdios*. Letters of the alphabet are much as one would expect. We use ‘y’ for υ alone as in *physis* or *hypostasis*, but ‘u’ for υ when it appears in diphthongs, e.g. *ousia* and *entautha*. We use ‘ch’ for χ, as in *psychê*. We use ‘rh’ for initial ρ as in *rhêtôr*; ‘nk’ for γκ, as in *anankê*; and ‘ng’ for γγ, as in *angelos*. The long vowels η and ω are, of course, represented by ê and ô, while iota subscripts are printed on the line immediately after the vowel as in *ôioгенês* for ὀιογενής. There is a Greek word index to each volume in the series. In order to enable readers with little or no Greek to use this word index, we have included an English-Greek glossary that matches our standard English translation for important terms with its Greek correlate given both in transliterated form and in Greek. For example, ‘procession: *proôdos*, πρόοδος.’

The following abbreviations to other works of Proclus are used:

in Tim. = *Procli in Platonis Timaeum commentaria*, ed. E. Diehl, 3 vols
(Leipzig: Teubner, 1903-6).

in Remp. = *Procli in Platonis Rem publicam commentarii*, ed. W. Kroll, 2 vols
(Leipzig: Teubner, 1899-1901)

- in Parm.* = *Procli commentarius in Platonis Parmenidem (Procli philosophi Platonici opera inedita pt. III)*, ed. V. Cousin (Paris: Durand, 1864; repr. Olms: Hildesheim, 1961).
- in Alc.* = *Proclus Diadochus: Commentary on the first Alcibiades of Plato*, ed. L. G. Westerink. (Amsterdam: North-Holland, 1954). Also used is A. Segonds (ed.), *Proclus: Sur le premier Alcibiade de Platon*, tomes I et II (Paris, 1985-6).
- in Crat.* = *Procli Diadochi in Platonis Cratylum commentaria*, ed. G. Pasquali. (Leipzig: Teubner, 1908).
- ET* = *The Elements of Theology*, ed. E. R. Dodds, 2nd edition (Oxford: Clarendon Press, 1963).
- Plat.Theol.* = *Proclus: Théologie Platonicienne*, ed. H. D. Saffrey and L. G. Westerink, 6 vols (Paris: Société d'édition "Les belles lettres", 1968-97).
- de Aet.* = *Proclus: on the Eternity of the World*, ed. H. Lang and A. D. Marco (Berkeley: University of California Press, 2001).

Proclus frequently mentions previous commentaries on the *Timaeus*, those of Porphyry and Iamblichus, for which the abbreviation *in Tim.* is again used. Relevant fragments are found in

- R. Sodano, *Porphyrii in Platonis Timaeum Fragmenta*, (Naples: Instituto della Stampa, 1964) and
- John Dillon, *Iamblichi Chalcidensis in Platonis Dialogos Commentariorum Fragmenta*, (Leiden: E.J. Brill, 1973).

Proclus also frequently confirms his understanding of Plato's text by reference to two theological sources: the 'writings of Orpheus' and the Chaldean Oracles. For these texts, the following abbreviations are used:

- Or.Chald.* = Ruth Majercik, *The Chaldean Oracles: text, translation and commentary*. (Leiden: Brill, 1989).
- Orph. fr.* = *Orphicorum fragmenta*, ed. O. Kern. (Berlin: Weidmannsche, 1922).

Majercik uses the same numeration of the fragments as E. des Places in his Budé edition of the text.

References to the text of Proclus' *in Timaeum* (as also of *in Remp.* and *in Crat.*) are given by Teubner volume number, followed by page and line numbers, e.g. *in Tim.* II. 2.19. References to the *Platonic Theology* are given by Book, chapter, then page and line number in the Budé edition. References to the *Elements of Theology* are given by proposition number.

Proclus' commentary is punctuated only by the quotations from Plato's text upon which he comments: the lemmata. These quotations of Plato's text and subsequent repetitions of them in the discussion that immediately follows that lemma are in bold. We have also followed Festugière's practice of inserting section headings so as to reveal what we take to be the skeleton of Proclus' commentary. These headings are given in centred text, in italics. Within the body of the translation itself, we have used square brackets to indicate words that ought perhaps to be supplied in order to make the sense of the Greek clear. Where we suppose that Greek words ought to be added to the text received in the manuscripts, the supplements are marked by angle brackets.

INTRODUCTION TO VOLUME 3

I The structure of Book III of Proclus' commentary on the *Timaeus*

The portion of Proclus' commentary translated in this volume takes in *Timaeus* 31b–34b in which Plato describes the body of the universe. However, Book III of Proclus' commentary – equivalent to volume II of the Teubner text of the *in Timaeum* – spans *Timaeus* 31a to 37c and thus includes Timaeus' discourse on the construction the World Soul and its union with the body of the universe. Because of the wealth of detail involved in Book III as a whole, the translators have taken the decision to dedicate a volume each to the body and soul of the universe respectively. The final volume of our series will condense into one the translation of Books IV and V of Proclus' commentary – equivalent to the third volume in the Teubner series of Proclus' text.

The question of the *skopos*⁸ or target of the *Timaeus* in general is taken up in the introduction to volume 1. Notionally, the *skopos* of the dialogue is supposed to be *physiologia* or the study of the realm of nature (I 1.17–20). 'Nature' here should be given its Aristotelian sense: what is at issue is the realm of things that change. This will include the body of the world as well as its soul, the individual heavenly gods such as stars and planets, as well as the kinds and individuals that inhabit the sub-lunary realm. However, we must remember Proclus' views on (what he takes to be) the characteristically Platonic manner of explaining things in the realm of nature by reference to productive, paradigmatic and final causes (I 2.1–9).⁹ By his lights, Plato's exploration of the subject matter of *physiologia* traces the explanation of these things back up to the Demiurge, the paradigm of the All-Perfect Living Being, and the Good. Moreover, the universe that is described as if it came to be in the *Timaeus* is itself a

⁸ On the concept of *skopos*, see Mansfeld (1994) and, earlier, Praechter (1990), 45–7.

⁹ On Plato's distinctive method in *physiologia* and explanation by true causes, see Lernould (2001), 105. Lernould's book, however, mostly concentrates on the structure of Proclus' commentary in Books I and II (= Diehl vol. 1).

‘visible god’ (34ab). Thus from Proclus’ point of view, the *Timaeus* is actually a profoundly *theological* work.

In Book III, this concern with the productive and paradigmatic causes of the visible cosmos is pursued through the theme of the ten gifts of the Demiurge. Proclus considers what the Demiurge is said to do in this section of the text and divides this activity into ten gifts that ‘the god who exists eternally’ provides to the ‘god who will at some time be’ (*Tim.* 34ab). These gifts are catalogued at *in Tim.* II 5.17–31.

1. It is perceptible by virtue of being composed of fire and earth. The nature of these elements require that there should also be the intermediates, air and water. (*Tim.* 31b)
2. The elements within it are bound together through proportion (*analogia*: *Tim.* 31c).
3. It is a whole constituted of wholes. (*Tim.* 32c)
4. Its spherical shape makes it most similar to itself and similar to the paradigm upon which it is modelled. (*Tim.* 33b)
5. It is self-sufficient, lacking organs for nutrition or sensation of anything external to it. This gift of the Demiurge has moral and theological import, since self-sufficiency is a property of what is good and characteristic of divine beings. (*Tim.* 33cd)
6. The motion of the world’s spherical shape upon its axis makes it similar to the motion of Intellect. (*Tim.* 34a, cf. *Laws* 10. 898a)
7. The world’s body is animated by a divine world soul. (*Tim.* 34b)
8. It has a revolution in time and is thus ‘a moving image of eternity.’ (*Tim.* 36e–37a)
9. The cosmos has the heavenly bodies in it, which Plato describes as the ‘instruments of time’ and Proclus as ‘sanctuaries of the gods.’ (*Tim.* 39d; *in Tim.* II 5.28)
10. Finally, the Demiurge makes the visible world complete or perfect (*teleios*). By virtue of all the living things within it, it is an imitation of its paradigm, the four-fold All-Perfect Living Thing. (*Tim.* 39e–40a)

This theme of ten Demiurgic gifts is carried forward from Book III through Book IV and serves as one of the means by which Proclus organises his discussion of Plato’s text. It allows him to further develop what he sees as the physico-theological character of the dialogue, since it organises the text by reference to two gods: the one

who bestows the gifts, and the “created” god upon whom the gifts are bestowed. The properties with which the universe is endowed are suitable qualities to make it divine since they promote the similarity between the visible model and its paradigm found in Intellect: the All-Perfect Living Being itself. This paradigm is, of course, itself an intelligible god in Proclus’ scheme of things, being located in the third of the triads that constitute Being (*Plat. Theol.* III 53.26).

The ten gifts of the Demiurge provide one means by which the *skopos* of the dialogue as a whole – distinctively Platonic “divine” physiology – is more narrowly specified in Book III. Another theme that Proclus pursues in Book III is that of the contrast between wholes and parts.

At the outset of Book I, Proclus specifically identifies ways in which Plato investigates *physiologia*. At different points it may seek these matters in *images*, in others in *paradigms*. Sometimes it looks at things as *wholes*, while at other times it moves at the level of *parts* (I 1.17–20). In his commentary in Books I and II, the contrast between investigating nature in images and paradigms has been to the fore. The recapitulation of the *Republic* and the narrative of Atlantis have been investigations carried through in images (I 4.7). Book II tends to be dominated by the investigation of physiology through paradigms, since this portion of the text is chiefly taken up with issues surrounding the nature of the Demiurge and the paradigm to which he looks in generating the sensible cosmos.

Immediately at the beginning of Book III, Proclus revisits the theme of wholes and parts which has hithertofore been less obvious. We can conceptualise the creation of the universe as a sequence of foundational acts (*hupostasis*). In the first hypostasis, only wholeness (*holotês*) is at issue. In this way of looking at the universe, we consider it as an imitation of the All-Perfect Living Thing. Given the nature of its paradigm, it must then be something living, possessed of intellect and divine. The second foundation ‘divides the cosmos by wholes and brings about the creation of whole parts’ (*holos meros*, II 2.12–14). By these ‘whole parts’ he means the essence of the soul considered in itself, and the body of the world similarly considered. Finally, there is a third foundational act in which the cosmos is divided into parts and each of the portions is completed or filled out. Here too, there are ‘whole parts’:

The third foundation comes next which involves cutting the universe into parts and completing each of the portions. Plato provides an account of how fire, how air, how water and how earth itself have come to be when at last he looks at the ‘body-making’ activity (*sômatourgikê energeia*) of the Demiurge. But even in these matters, he does not descend to the level of particulars, but remains at the level of elements considered in their entirety. For the wholesale creation (*holê dêmiougia*) of the wholes is one that involves whole parts but [the creation of] individuals (*atoma*) and genuine particulars (*ontôs merika*) he gives to the young gods (42d6).... (in *Tim.* II 2.22–3.2)

Unlike the ten gifts of the Demiurge, these three foundations should not be thought of as exclusive divisions of the narrative structure of the dialogue. The first foundation can be seen in this way: it refers to the portion of Timaeus’ account that comes before 31b. But the second and third foundations coincide if considered as segments of the dialogue. At no point does Plato’s text really consider the world’s body or soul in itself, as opposed to considering the elements from which they are made up. Thus, Timaeus immediately argues from the fact that the Demiurge made the world’s body visible and tangible that it must have fire and earth in its composition (*Tim.* 31b4). This, in turn, requires the presence of air and water as middle terms to create continuous a geometrical proportion that unifies this body. Similarly with the World Soul: the first thing that Timaeus tells us about are the ‘elements’ from which it is composed: a mixture of the divisible and indivisible kinds of Being, Sameness and Difference (*Tim.* 34b10). So unlike the organising schema of the ten gifts to the cosmos, the three foundations are thematic – not narrative.

What of the central role played by the notion of ‘whole’ and ‘part’ in this thematization of the subject matter of the text that Proclus now proposes to discuss? In particular, what is a ‘whole part’? Moreover, what is the relation between the ‘division by wholes’ (*kath hola diairein*, II 2.13) of the second foundation and the cutting into parts (*kata merê temnein*, II 2.22) of the third?

Proclus’ use of whole and part as a theme is doubtless grounded in Plato’s text. After all, it is Plato who describes the Demiurge as creating ‘a whole composed out of wholes’ (*Tim.* 33a). Proclus quotes this text in a variety of places and not all of them appear to divide or thematize the dialogue in ways that are entirely consistent with the

opening of Book III.¹⁰ The general tenor of these remarks is that what is a whole composed of wholes is ever so more unified and complete than a whole composed of parts.

Along with this textual grounding, there is the semantic association of ‘whole’ with the term for a universal – Aristotle’s *katholou* being from *kata holon*, of course.¹¹ And naturally the neoplatonists suppose that universals exhibit more of the character of the One than do particulars. After all, universals manage to be *one and the same thing* across all their many instances.¹² So one way to think of ‘a whole composed of wholes’ would be the peculiar kind of “composition” of the genus by all its various species. Proclus, of course, does not think that the species *constitute* all the ways of being the genus and so exhaust the being of the genus. The neoplatonists turn Aristotle’s mysterious doctrine of the genus as matter on its head. The genus is the power of the species and it is prior to them. In spite of the limitations of the analogy between material composition and the relation between genus and species, Proclus thinks that the universe has a kind of wholeness that is a reflection of the wholeness had by its paradigm: the intelligible Living Being Itself.¹³ This is a whole which includes the wholes ‘being a heavenly living being’, ‘being a terrestrial living thing’ and so on.

¹⁰ In particular, see II 281.23–30. Here too we are told that the creation of the universe is three-fold. But it is far from clear that this architectonic matches the one before us. In the first creation, the universe is brought forth from the elements bound by proportion and this makes it a ‘whole composed out of wholes’ (*Tim.* 33a7). In the second, though, we find the arrangement of ‘whole spheres’ – its composition from the elements making it impossible that it should not be divided into spheres. These spheres will be the spatial counterparts of the circles in the soul. Finally, there is a third creation in which the universe is filled up with particular or partial living things (*merikōn zōōn*). These are the heavenly, aerial, terrestrial and aquatic kinds of *Timaeus* 39e-40a.

¹¹ Cf. *Phys.* I.1, 184a24, ‘a universal is a kind of whole, comprehending many things within it, like parts’.

¹² See, for example, Plotinus IV.1.1 where the divisibility of the universal across its instances is unfavourably contrasted with the utter divisibility of bodies.

¹³ At another point at which Proclus invokes *Timaeus* 33a7, he notes that the four kinds of living being do not constitute or make up (*symplēroun*) the intelligible Living Being Itself. Rather, they are included within it (*periechomenos*), in *Tim.* II 147.9–12.

This parallel between the universe and its intelligible paradigm helps us to understand why Proclus describes the universe as a whole in the manner of a whole – a whole *holikôs* (*in Tim.* II 62.1–9). This status is contrasted with the ‘whole parts’ or being a part that exists *holikôs*. These ‘whole parts’ are characteristic of the second and third foundations we are presently considering. What are they?

The distinction is, I believe, a reflection in the sensible realm of a similar distinction drawn by Proclus in the intelligible realm. According to *ET* 180, the Unparticipated Intellect is a whole simpliciter because it has all its parts within itself *holikôs*. By contrast, each partial or particular intellect has the whole in the parts and is thus all things *merikôs*. I think we may infer that whatever is *all things* in the manner of a part is a part in the manner of a whole. So ‘all things in the manner of a part’ (*panta merikôs*) equals ‘a part in the manner of a whole’ (*merê holikôs*). What then is this? When Proclus contrasts the unparticipated with the participated intellects, he intends a greater degree of speciation, and thus plurality, in the latter than in the former. Each participated intellect is such that, though all Forms are in it implicitly, one Form in particular stands out from it explicitly (*ET* 170). All the Forms must be in it implicitly in light of the dictum that ‘all things are in all, but in each appropriately’. So if a particular intellect is a part in the manner of a whole – a *merê holikôs* – it contains in a partial or implicit way (*merikôs*) all the things that the whole of which it is a part contains in the manner of a whole. That this is so, is confirmed by the disambiguation of the word ‘part’ that Proclus offers in his *Parmenides* commentary:

So that which has the same elements as the whole, and has everything in the manner of a part (*merikôs*) that the whole has in the manner of a whole (*holikôs*), we term a part. For instance, each of the many intellects is a part of the whole Intellect, even though all of the Forms are in each [but not *holikôs*]. The sphere of the fixed stars is a part of the universe, even though it is inclusive of all things contained within it, but in a different manner than the cosmos. (*in Parm.* 1112.26–33)

Using this as a guide to the sense of ‘whole parts’ in the second and third foundations referred to in the *Timaeus* commentary, we may say that the World Body and World Soul contain all that is contained in their paradigm in a manner that exhibits further speciation and plurality. The division of the universe into a psychic and corporeal element is a division in terms of wholes (*kath hola*) because, while body and soul are “parts”, they are parts that *any* sensible living thing must have. This

kath hola division in the second foundation may then be contrasted with the division in terms of parts (*kata merê*) in the third foundation. Here we discuss the particular composition of the World Body and World Soul from the four elements and the divisible and indivisible kinds of Being, Sameness and Difference respectively. These parts are more specific and involve yet more plurality. But in spite of this fact, these parts are still supposed to exhibit something analogous to the way in which all the Forms are implicit within a particular intellect, though one stands out. In the case of the elements from which the World Body is composed, this idea of containing all things *merikôs* is to be explained by the fact that in order to be a single, visible body it must contain all four elements unified by proportion. Similarly, in order to be the very thing that it is, the World Soul must be a synthesis of Being, Sameness and Difference.

These two devices – the gifts of the Demiurge and the theme of whole and part – provide narrative and thematic frameworks, respectively, within which Proclus supposes Plato’s text is organised. Let us now turn to some of the important points that he purports to find within this framework.

II Issues in Proclus’ commentary

Because of the commentary form and because of Proclus’ attempt to engage both with Plato’s text and with the philosophical problems that it generates at a variety of levels, it is often hard to discern the important contributions that Proclus makes. The general line of argument gets lost in the welter of particular detail. In what follows we consider Proclus’ commentary on the body of the world from a higher vantage point in order to provide the context for some of his interpretations of Plato. We will explain in general terms how he reads Plato’s text, and also how he meets criticisms of the views that he attributes to Plato.

Elements, proportions and the aether

The first fifty pages of Proclus’ commentary in this volume are dominated by considerations about the nature and number of the elements. Though Plato’s text does

not discuss the composition of the heavenly bodies until 40a, the question of the existence of the Aristotelian fifth element is raised by Proclus in his remarks on 31b5–9.¹⁴ Proclus’ response to Aristotle on the composition of the heavens and the fifth element is given piece by piece in the commentary. Its overall structure is thus hard to discern. The response has both a positive and a negative aspects.¹⁵

On one hand, Proclus criticises Aristotle’s argument from *On the heavens* I.2. This argument does not, in fact, preclude the possibility that the heavens are composed primarily of fire, if we deny certain Aristotelian assumptions about the natural motions of the elements. Specifically, Aristotle had argued that corresponding to each simple element there is a simple natural motion. Each element also has a natural place at which it is naturally at rest. The place of earth is at the centre of the universe and thus its natural motion is down or toward the centre. The natural motion of fire is upward toward its natural place. Air and water have a natural place intermediate between these. The four sublunary elements thus all have motions up or down. But if the motion of the heavens is natural and not forced, it must be because the heavenly bodies are composed of an element whose natural motion is circular. But this can’t be fire, since fire’s natural motion is up. Nor can it be any of the other sublunary elements. So the heavens must be composed of a fifth element, the aether.

Earlier critics had called into question Aristotle’s doctrine of natural place, but this was an aspect of Aristotle’s physics that the neoplatonists sought to retain. Plotinus had also denied that fire was ever naturally at rest. Elements in their natural place either rest or move in a circle. However, Plotinus had no theory of the elements that might explain why this should be so.

Proclus gives us such a theory. This is the positive aspect of his response to Aristotle. According to this theory, each element is characterised by three defining

¹⁴ The text of the lemma in question is: ‘That which comes to be must be corporeal (*sômatoeidês*) and so visible and tangible. But nothing could come to be visible without fire, nor tangible without something solid, and nothing could come to be solid without earth. For these reasons when the god began making the body of the universe, he made it from fire and earth.’ Proclus introduces an Aristotelian objection that fire is not the only element through which things are visible. The sun and stars are visible, but they are not composed of fire. (II 9.7–10.16)

¹⁵ These ideas are pursued in more detail in Baltzly (2002).

properties – not two, as in Aristotle’s theory. Among fire’s defining properties is being easily moved. By contrast, earth is moved only with difficulty. This explains why each behaves differently when it reaches its natural place. But Proclus’ theory of the elements is integrated with his account of the proportion (*analogia*) that binds together all four elements in the *Timaeus* (31b–32b). It is a mathematical physics in the sense that Proclus supposes that the transformation of the elements into one another is strongly parallel to the arithmetical method through which you find the middle terms in a geometric proportion between similar solid numbers or cubes. To fully appreciate the depth of Proclus’ theory of the elements and thus the force of his response to Aristotle, more needs to be said about proportions in the *Timaeus*.

1. Proportions in the *Timaeus*

First let us consider the way in which proportion crops up in Plato’s text. An understanding of these proportions is important not only for an appreciation of Proclus’ theory of the elements, but simply for an understanding of his commentary on *Timaeus* 34a-34b.

- In 34a-34b, the body of the world is shown to contain four elements by appeal to an argument that relies on (at least an analogy with) mathematical proportion. Since the cosmos is a four-dimensional solid, and solid numbers require two middle terms – not just one – to establish a *geometric* proportion, the world must contain air and water in addition to the elements of fire and earth which are responsible for its visible and tangible nature (31b).
- In 35b-c, *Timaeus* describes the Demiurge taking portions of the substance from which he constitutes the soul of the world. These portions form two instances of continuous *geometric* proportion: 1, 2, 4, 8 and 1, 3, 9, 27.
- In 35c-36a, the Demiurge ‘fills in’ the intervals between these sequences with the *arithmetic* and *harmonic* means to obtain the sequences: **1**, *4/3*, 3/2, **2**, *8/3*, 3, **4**, *16/3*, 6, **8** and **1**, *3/2*, 2, **3**, *9/2*, 6, **9**, *27/2*, 18, 27. (Original portions are indicated in bold, harmonic means in italic, and arithmetic means by underline.)

The latter two texts fall outside the bounds of the present volume, but the arithmetic and harmonic proportions have been sometimes thought to be relevant to the text of 32a-c. Hence it will do no harm to discuss them briefly here.

Plato does not bother to explain what these various means are. Since the lectures on the *Timaeus* are for advanced students, Proclus also spends relatively little time in discussing the mathematical background to Plato's text or to his remarks on that text. The neoplatonic sequence of studies would have included a background in mathematics – certainly prior to the study of Plato, if not to the study of Aristotle. (Marinus is a bit unclear in his biography about whether Proclus' own preparatory studies in Alexandria, and of Aristotle's logic under the tutelage of Olympiodorus, coincided with his mathematical studies with Hero (Marinus, *Vit Proc.* §9).) Yet Proclus does spend *some* time outlining the nature of the proportions in question (*in Tim.* II 19.10–20; 20.21–23.8; 30.8–36.19), just as he quickly rehearses astronomical arguments for the sphericity of the cosmos (II 73.26–75.18). One might suppose that this was simply to re-awaken the memory of the salient facts in the mind of his audience. Or perhaps it is because his audience included some who had not undertaken the full course of studies as yet.

The modern reader who wants to approach Proclus' commentary in the spirit of 5th century CE platonism can do so by having Nicomachus' *Introduction to Arithmetic* and Theon of Smyrna's *Mathematics Useful for the Understanding Plato* at hand. Nicomachus of Gerasa was a neopythagorean philosopher of the first or early second century CE. His *Introduction* takes the reader through the explanation of the importance of mathematical studies (I.1–6); the Pythagorean definition of number (I.7); their classifications of numbers (I.8–16); explanations of relations between numbers such as 'the superparticular' $n + 1 : n$ (I.17–II.5); "plane and solid" numbers (II.6–20); and the theory of proportions (II.21–29). Theon's handbook is less detailed in its approach to Pythagorean number theory but includes a section on astronomy. Proclus was acquainted with both authors,¹⁶ but perhaps knows Nicomachus better. Proclus follows Iamblichus in questions about the central canon of Platonic works, so he may be assumed to have accepted Iamblichus' views on the preparation for the

¹⁶ Theon of Smyrna is probably the Theon mentioned *in Tim.* I 82.15. Nicomachus is named at II 19.4 and 20.25.

study of Plato's philosophy as well. This may be true even if Proclus had a slightly different view on Plato's Pythagoreanism than Iamblichus did.¹⁷ Iamblichus clearly thought Nicomachus was valuable since he wrote a commentary on the *Introduction to Arithmetic*. It seems likely, though by no means certain, that Proclus possessed this work.¹⁸ In fact, Marinus tells us that Proclus supposed that he had *been* Nicomachus in a previous life (*Vit.Proc.* §28)!

What do these mathematical treatises tell us about the geometric, arithmetic and harmonic proportions?¹⁹ The term that is used most frequently for proportion is 'analogia'. Writers of this period may also use 'mean' (*mesotês*), though the same term may also be used to denote the term between two others in a proportion.²⁰ Equally, authors may use *to meson* for either of these functions. This latter terminology is not innocent of other associations as well. It is associated with what is physically between things and this was doubtless the origin of its technical sense. There is also Aristotle's use of the 'middle term' in a syllogism. Like the mean in a proportion, this binds together the premises and thus provides the bridge by means of which major and minor term can find their way into the conclusion.

Nicomachus defines 'proportion' (*analogia*) as follows:

in the proper sense, the combination of two or more *ratios* (*logos*), but by the more general definition the combination of two or more *relations* (*schesis*), even if they are not brought under the same ratio, but rather a difference or something else.

¹⁷ O' Meara (1989), 148.

¹⁸ The *index auctorum* in *Platonic Theology* lists Iamblichus' commentary at IV 99.20. But it is unclear to me whether Proclus is here drawing on Iamblichus' commentary or on Nicomachus himself.

¹⁹ The history of the proportions is discussed in Heath (1921) vol. 1, 85–90. The earliest definitions reported are those of Archytus in a fragment of his work *On Music* preserved in Porphyry and Iamblichus. The works of Nicomachus, Theon and Pappus list seven further proportions, but the history and credit for them is somewhat disputed. In any case, the first three proportions are the ones relevant to Plato's text and for this reason Proclus eschews discussion of the others (*in Tim.* II 19,2).

²⁰ I here summarise much of what may be found in Tracy (1969) Appendix I and D'Ooge (1972), 264 n. 2.

In the strict sense, only geometric progressions such as 2, 4, 8 count as proportion, for the ratio of the first term to the middle term is the same as that of the middle to the last.²¹ But by extension, ‘*analogia*’ may be applied to a sequence of three or more terms where the middle term or terms are such that it exceeds the previous term by the same amount that the subsequent term exceeds it.²² In this case, the same relation obtains between each member of the sequence and we have an arithmetic proportion. The relation in the harmonic proportion is more complex. In the series 2, 3, 6, the middle term exceeds 2 by 1 which is $\frac{1}{2}$ of 2. Likewise, the 6 exceeds the middle term by 3 which is likewise $\frac{1}{2}$ of 6. So in the harmonic proportion, the middle term exceeds and is exceeded by the ‘same part’ of the extreme terms.²³

This way of spelling out the relations involved in the arithmetic and harmonic proportions is slightly awkward. The formulae for these proportions can be specified in modern mathematical notation. But doing so may make us miss some of the features of these proportions that the ancients thought of as relevant. So, for example, Proclus insists that all these proportions have their genesis in *equality* (*in Tim.* II 20.1–9). How so? In the case of geometric proportion, the *ratio* remains the same. In arithmetic proportion, the numbers differ by the *same amount*. In the harmonic proportion, one term exceeds another by the *same part* of the preceding term as it is exceeded by the subsequent term. Because he thinks about these proportions in this

²¹ [Geometric proportion] ‘exists whenever, of three or more terms, as the greatest is to the next greatest, so the latter is to the one following, and if there are more terms, as this again is to the one following it, but they do not, however, differ by the same quantity, but rather by the same quality of ratio.’ Nicomachus, *Arith.* II 24.1, trans. D’Ooge. Cf. Theon, 107.5 and 114.1 ff.

²² ‘It is an arithmetic proportion, then, whenever three or more terms are set forth in succession, or are so conceived, and the same quantitative difference is found to exist between the successive numbers, but not the same ratio among the terms one to another.’ Nicomachus, *Arith.* II 23.1, trans. D’Ooge. Cf. Theon 113.18 ff.

²³ ‘The proportion that is placed in the third order is the one called the harmonic, which exists whenever among three terms the mean on examination is observed to be neither in the same ratio to the extremes, antecedent of one and consequent of the other, as in the geometric proportion, nor with equal intervals, but an inequality of ratios, as in the arithmetic, but on the contrary, as the greatest term is to the smallest, so the difference between greatest and mean terms is to the difference between mean and smallest term.’ Nicomachus, *Arith.* II 25.1, trans. D’Ooge. Cf. Theon 114.14 ff.

way, Proclus feels no hesitation in giving proportion a cosmogonic significance. Proportion has its genesis from Equality, and Equality, in turn, is analogous to Sameness, the Monad, the Limit, and to Similarity through which association (*koinonia*) is introduced to things. Sameness is a principle of unity, as opposed to Difference which is the principle of diversity and making many from one. As a result, proportion has the properties of uniformity (*moneidês*), the capacity to bring things together and to make objects one. Thus for Proclus, these mathematical proportions are not merely mathematical. Like everything else in the middle orders of his ontology, they are simultaneously images of higher principles and paradigms of things that come after them.

2. The Bond of the Universe: Proclus and the problem of *Tim.* 31c4–32b9

Plato builds a case for a theory that includes all four elements in the composition of the world's body on the basis of some facts about the proportions just discussed. Exactly how he builds this case has been the subject of dispute however. This section examines Proclus' contribution to the resolution of this dispute.

Plato's general strategy is clear enough. First, he notes that we can have cases where *one* mean can establish a continuous geometrical progression between *two* "somethings" (34c4–32a7). (I'm being intentionally vague here, because the interpretive problem turns on just what these "somethings" might be.) However, the cosmos is not merely a two-dimensional object. Rather, it is a solid. But *solids*, Plato tells us, require *two* middle terms to establish a continuous geometric progression (32a7–b5). Thus, between fire and earth, which are responsible for the visible and tangible character of the generated cosmos, we must locate two other elements – not just one – air and water (32b5–9).

Several things about this argument require some explanation. Some of it is relatively easy and involves only a little mathematical background. Timaeus and Proclus speak of 'plane' and 'solid' numbers. This terminology evolved from the Pythagorean practice of representing numbers spatially. A plane number is one with two factors, corresponding to the sides of the *gnomon* or rectilinear arrangement of dots by means of which it might be represented. Thus Euclid, Book VII, df. 16: 'when two numbers multiplied together produce a third, the number so produced is called

plane (*epipdos*), and the numbers which were multiplied are called its *sides* (*pleurai*).’ A number that is the product of three factors is called ‘solid’. Euclid VII, df. 17: ‘when three numbers are multiplied together to produce a fourth, the number so produced is a *solid* (*stereos*) number and the numbers multiplied together are its sides.’ *Square* numbers are a species of plane numbers where the sides are equal, and of course the length of the side corresponds to the square root of the number (df. 18). *Oblong* numbers are those where the sides are not equal. 8 and 27 are examples of cubic numbers and can be thought of as cubes with equal sides corresponding to their cube roots (df. 19). Finally, there is the terminology of *similar* numbers. Planes or solids are similar when their sides are in proportion (Euc. VII, df. 21). That is to say, if $a \times b$ and $c \times d$ are similar plane numbers, then $a : c :: b : d$. The same applies for the case of similar solid numbers. In this case, ‘as length is to length, so breadth is to breadth and height is to height.’²⁴ Naturally squares and cubes are all similar since their sides are exactly the same. So much then for the terminology.

What are the actual mathematical relations? Euclid’s *Elements* shows that between any two *square* numbers one number can establish a geometric proportion. However, to establish this proportion between two *cubes*, two means are necessary (VIII, 11, 12). But this property is not limited to square and cube numbers: it is also true of *similar* planes and *similar* solids (VIII, 18, 19). It is not true of plane or solid numbers generally. Indeed, the existence of a single mean between two numbers is a sufficient condition for a number being a similar plane (VIII, 20) and the existence of two means in geometric proportion is a sufficient condition for the extreme terms being similar solids (VIII, 21). So much for the facts of the matter – the *pragmata* as Proclus would say – let’s return to Plato’s text.

The crucial lines are in the first step of the argument at *Timaeus* 31c4–32b3. Everything from the second line on is easy enough:

Now [when we have a case where], the middle term between any two of them is such that what the first term is to it, it is to the last, and conversely, what the last term is to the middle, it is to the first, then – since the middle term turns out to be both first and last, and the last and the first likewise turn out to be middle terms – they will all of necessity turn out to have the same relationship

²⁴ Theon of Smyrna, 37.4 (Hiller).

to each other, and given this, all of them will be unified. Therefore if the body of the universe were to have come to be as a plane, having no depth, a single middle term would have been sufficient to bind both itself and the things with it. But in fact it has been assigned to be a three-dimensional solid and solid things are never conjoined by a single middle term but always by two middles.²⁵

The problem arises in the specification of the case in question. The Greek syntax in the first line can be taken in any of the following three ways:

1. Whenever of any three numbers, whether *ongkôn* or *dunameôn*, the middle one is such that ...²⁶
2. Whenever of any three numbers, the middle one between any two which are *ongkôn* or *dunameôn* ...²⁷
3. Whenever of three numbers or *ongkôn* or *dunameôn*, the middle is such that ...²⁸

Since all three of these are syntactically possible, our decision must turn on the meaning of the terms in question. This takes us on to the semantic problem. This concerns how we are to understand the terms that have been left untranslated so far. The scholarly debate has centred on the question of what the *dunameis* in question are, and to a lesser extent the *ongkoi*. The problem is that the term *dunamis* (or *dunameis*, plural) can mean a power like heat. (In particular, among neoplatonists like

²⁵ The text reads: ὁπόταν γὰρ ἀριθμῶν τριῶν εἴτε ὄγκων εἴτε δυνάμεων ὠντινωοῦν ἢ τὸ μέσον, ὅτιπερ τὸ πρῶτον πρὸς αὐτό, τοῦτο αὐτὸ πρὸς τὸ ἔσχατον, καὶ πάλιν αὐτῆς, ὅτι τὸ ἔσχατον πρὸς τὸ μέσον, τὸ μέσον πρὸς τὸ πρῶτον, τότε τὸ μέσον μὲν πρῶτον καὶ ἔσχατον γιγνόμενον, τὸ δ' ἔσχατον καὶ τὸ πρῶτον αὖ μέσα ἀμφοτέρα, πάνθ' οὕτως ἐξ ἀνάγκης τὰ αὐτὰ εἶναι συμβήσεται, τὰ αὐτὰ δὲ γενόμενα ἀλλήλοις ἐν πάντα ἔσται. εἰ μὲν οὖν ἐπίπεδον μὲν, βάθος δὲ μηδὲν ἔχον ἔδει γίγνεσθαι τὸ τοῦ παντὸς σῶμα, μία μεσότης ἂν ἐξήρκει 32.b τὰ τε μεθ' αὐτῆς συνδεῖν καὶ ἑαυτήν, νῦν δὲ στερεοειδῆ γὰρ αὐτὸν προσῆκεν εἶναι, τὰ δὲ στερεὰ μία μὲν οὐδέποτε, δύο δὲ αἰεὶ μεσότητες συναρμόττουσιν·

²⁶ This option takes the genitives εἴτε ὄγκων εἴτε δυνάμεων with ἀριθμῶν τριῶν.

²⁷ This option takes the genitives with τὸ μέσον.

²⁸ This option treats all three terms as linked by an implicit εἴτε before ἀριθμῶν.

Proclus, it is frequently used as a word for property). In specifically mathematical contexts, a square root or square number. But *'dunamis'* finds application in musical contexts too, where it can mean a pitch. Similarly, *ongkoi* can be solids or cube numbers.

Heath built a case for treating the former as 'square number', since *'dunamis'* usually means 'square root' in mathematical contexts. One could then treat the *ongkôn* as 'solids' or perhaps even 'cubes' to make it parallel to *dunameôn*. But this suggestion faces certain problems. First, it is just not generally true that between any two square numbers there is a mean that is itself a square.²⁹ Second, as Plato's text goes on to note, cubes require not one, but two terms, for geometric proportion. Thus the claim as stated is just false. One could only suppose that Plato has tripped over his words in his excitement to get to the four-term proportion that binds cubic numbers. Third, as noted above, the existence of a single geometric mean is not confined to squares: it is also true of similar plane numbers.

The second syntactic alternative keeps the semantic treatment of *dunameôn* as 'square numbers.' This is the option that Cornford took in his translation and commentary on the *Timaeus*.³⁰ This is fair enough, perhaps, but it still leaves the other two objections untouched.

Pritchard considers the common premise in the Heath-Cornford position – that *dunamêon* in this passage means 'square number' and finds the evidence wanting.³¹ Thus, it is perhaps just as well that Proclus takes the third syntactic alternative.

This alternative is represented in the modern literature by Taylor.³² Taylor cites Proclus *in Tim.* II 22.18 and claims that he is correct to construe Plato as

²⁹ Heath himself points this out. Heath (1921) vol. 1, p. 89.

³⁰ Cornford supposed that the first objection that Heath himself considered 'can be obviated by construing the genitives εἴτε ὄγκων εἴτε δυνάμεων ὀντινωνοῦν not (as is commonly done), as in apposition to ἀριθμῶν, but as depending on τὸ μέσον. The effect is to make the limitation to cubes and squares apply only to the extremes.' Cornford (1957), 47.

³¹ Pritchard (1990).

³² Taylor (1928)

discussing three alternatives – numbers, volumes and *dunameis* – in which the middle term may be such that ‘what the first term is to the it, it is to the last, and, conversely, what the last is to the middle, it is to the first’ (32a1–4). However, Taylor also assumed that all three proportions are under discussion here: the arithmetic, geometric and harmonic. Moreover, he supposed each of these is apportioned to a particular alternative: the arithmetic to numbers, the geometric to volumes, and the harmonic to *dunameis*. Following Proclus, he treats these as musical values or pitches ranging from high to low. This, Taylor supposed, correlated with the three Pythagorean studies of arithmetic, geometry and harmonics. But Taylor actually misrepresents Proclus’ view. Proclus thinks that these means *especially* pertain to the corresponding substrates of numbers, magnitudes and pitches, but not *exclusively* so. Moreover, while Proclus recognises that the arithmetic and harmonic proportions can be called proportions – and are so called by Plato in the discussion of the divisions within the world soul – the proportion that is being discussed in *Timaeus* 32a is the geometric one. So, in fact, the *correct* understanding of Proclus presents an interpretation of Plato’s text that has no champion in the contemporary literature. Proclus thinks that in this passage Plato says or implies that:

1. Continuous geometric proportions can be exhibited by terms in several different kinds of subjects. These may be numbers, magnitudes, musical values, and powers more generally.
2. The other forms of proportion can similarly be exhibited in these different sorts of subject, though the arithmetic proportion is particularly characteristic of numbers, geometric of magnitudes, and the harmonic of musical values.³³ Even so, the proportion under discussion in the 32c4–32b9 passage is geometric proportion
3. Between any two similar planes or squares, a single middle term is sufficient to establish geometric proportion.

³³ At II 21.18–22.20 Proclus attempts to show how the various proportions can be established in these different subjects. His exposition of the way in which the various means can be realized in musical values seems to betray some confusion on his part about harmonics. See my notes on the text.

4. Between any two similar solids or cubes, two middle terms are required. This principle may *seem* open to counter-example, but all the examples where we find a proportion established by one term between similar solid or cube numbers are examples of numbers that are simultaneously squares or similar planes.
5. The elements fire, air, water and earth are strongly analogous to similar solids or cubes.
6. The universe is bound together by something that plays the same role *vis a vis* the elements that geometric proportion plays in relation to the numbers, magnitudes or musical values.
7. Therefore the universe must contain air and water as well as fire and earth.

Does Proclus' interpretation leave Plato with a convincing argument for the existence of four, rather than merely two, elements? You might suppose it does not. One of the positive features of the Heath or Cornford interpretation of *Timaeus* 34a is that it presents us with a carefully articulated mathematical fact: that two terms are required to establish a geometrical proportion between cubes or similar solid numbers, while between square numbers or similar solids, one middle term is sufficient. If we cease to understand the *dunameis* as 'square numbers', where does this leave the argument? Perhaps the argument is really no worse off. After all, what is the connection on the Heath-Cornford line between this mathematical fact and what must be the case for things that are not numbers, i.e. the elements and the cosmos composed of them? The answer is not clear.

The way that Proclus reads the passage, Plato claims that Heath's arithmetical fact obtains in the case of magnitudes, as well as in the case of properties generally. Proclus tries to make this plausible by showing that all the proportions can be established between geometrical figures and musical values. That leaves us with *dunameis* in the wider sense – powers or qualities. What reason is there to think that what holds good for numbers, magnitudes and musical values holds good there too? Proclus' interpretation requires that we posit a strong analogy between the elements and the mathematical or musical subjects in which proportion are realised in order to get the mathematical observation to do any cosmogonical work. But so does the

Heath-Cornford interpretation. Moreover, Proclus makes a strong attempt to give a theory of the elements that vindicates this analogy. Since the burden of the argument so clearly falls on premises 5 and 6, let us now turn to the way in which the elements are strongly analogous to cubes or similar solids.

3. Constructing the elements as cubes

Proclus considers methods for finding geometric middle terms given two cubes or similar solids. Cubes or similar solids can be thought of as magnitudes corresponding to numbers with three factors. So take the two cubes $2 \times 2 \times 2$ and $3 \times 3 \times 3$. We can find the values for the geometric proportion 8, x, y, 27 by taking two factors from one extreme or end term and multiplying them by a factor from the other extreme term. So, $2 \times 2 \times 3$ for x, and $2 \times 3 \times 3$ for y. The term for factors here is ‘side’ – this makes explicit the connection between arithmetic and geometry.

The same method can work for similar solids. Take two merely similar solids like 12 ($2 \times 2 \times 3$) and 96 ($4 \times 4 \times 6$). (These solids are similar since the “length, breadth and height” are all in the ratio 2:1.) There is, however, a complication. You can follow Proclus’ recipe for taking sides from each and generate numbers that won’t be in continuous geometric proportion. So, 16 ($2 \times 2 \times 4$) and 72 ($3 \times 4 \times 4$) each take two sides from the extreme closest to them and one from the extreme further away. But 12, 16, 72, 96 isn’t a continuous geometrical proportion. Of course, Proclus’ method will also produce 24 ($2 \times 2 \times 3$) and 48 ($2 \times 4 \times 6$) which do.

Let us now turn from the realm of mathematics to the realm of physical bodies. Proclus presents a variety of arguments for the inadequacy of a theory of the elements that assigns only two essential properties or powers to each one. Specifically, he attacks Aristotle’s theory of the elements. We can represent Aristotle’s account by the following table:

Fire	Hot + Dry
Air	Hot + Moist
Water	Cold + Moist
Earth	Cold + Dry

Proclus makes two objections here. First, since the adjacent elements have one power in common with their neighbour and one power opposed, how will we get an orderly cosmos? The elements are no more akin than they are opposed (II 38.7–16). Second, such a theory makes each extreme term more opposed to an intermediate than to an opposite term. Fire and Earth at least have dryness in common. But Fire and Water are completely opposed. An adequate theory should reveal how Fire and Earth are completely opposed. By Aristotle’s lights, the natural motions of these two elements are opposites: upward and downward. But how could it be that nature has assigned them opposite motions and natural places farthest from one another if they aren’t by their very nature maximally opposed (*in Tim.* II 38.17–31)?

These objections to the competing position clear the way for Proclus’ presentation of his own theory. He chooses the powers or properties (*dunameis*) that are characteristic of the elements from Plato’s descriptions of them in the *Timaeus*. These are represented in the following table.

Fire	tenuousness or smallness of particles	sharpness	easy mobility
Air	tenuousness or smallness of particles	bluntness	easy mobility
Water	density or thickness of parts	Bluntness	easy mobility
Earth	density or thickness of particles	Bluntness	difficult to move ³⁴

This assignment of properties to the elements escapes the objections made against the Aristotelian theory. Fire and Earth are maximally opposed. Each adjacent element shares two properties with its neighbour. Thus, they are more alike than they are opposed and we may therefore suppose that they can get along with one another well enough to form an orderly cosmos.

Given these properties, Proclus then assimilates the physical elements to mathematical similar solids.

³⁴ Sometimes Proclus actually says immobility (*akinêsia*). This too is a contrary of sorts to what is easily moved.

Suppose fire is tenuous, sharp and easily moved. ... Therefore, since earth is the contrary to fire, it will have the contrary powers: density, bluntness and immobility. And surely we see all these things manifested in earth. This is a case of things that are in conflict and moreover are solids and specifically *similar* solids – for their sides and powers will be in proportion; for as the dense is to the tenuous, the blunt is to the sharp and the immobile is to that which is easily moved. But *similar solids* are the ones whose sides and powers are in proportion – or if you wish to put it in the physical manner of speaking, *similar bodies* are the ones where the powers that constitute those bodies are in proportion. (*in Tim.* II 39.19–40.2)

These similar bodies are analogous to the similar solids or numbers conjoined by proportions.

But this is not the only way in which Proclus assimilates physical bodies to the mathematical subjects between which proportions may be found. He gives a general account of the physical analogues of numbers, magnitudes and musical values at II 24.30 ff. ‘Physical numbers’ are enmattered forms that are divided in relation to bodies. Physical volumes or magnitudes are the extensions of these physical numbers and their “spatialization” (*diastasis*) that is associated with matter, II 24.4–5). Finally, the physical counterpart to musical values or powers (*dunameis*) are the qualities (*poiotêtes*) that connect bodies and make them have form. These, then, are the physical subjects between which something analogous to proportion can hold.

Here, then, is the justification for premise 5 in the argument of the previous section. A proper understanding of the elements shows *how* they are strongly analogous to similar solid numbers or magnitudes. Finally, we may note that the assignment of ease of mobility to fire completes the case against Aristotle’s argument in *On the Heavens* I.2. Plotinus sought to evade the argument by suggesting that it was possible that fire might move in a circular fashion rather than come to rest in its natural place. Thus, the fire in the heavens might move by its own nature in a circular fashion. Proclus’ theory of the element shows how this possibility might be an actuality. Ease of mobility is an essential property of fire.

4. The life of the cosmos as the analog to proportion between numbers

The previous section considered the way in which, on Proclus’ account, the elements are strongly analogous to the similar solids or cubes that are bound by geometric proportion. But in order for Plato’s argument for the four element universe to work,

not only must the elements be like these solids, there must be *something* that plays the same role in the cosmos that proportion plays between numbers. Proclus argues that what plays this role in the case of the universe is ‘a single Life and Reason that runs through itself primarily, and then through all things’ (II 24.4–5) Let us approach the nature of this analog of proportion by considering the classification that Proclus gives of kinds of bond.

Plato speaks of proportion (*analogia*) as the bond (*desmos*) of the universe. (*Tim.* 31c4). Proclus discusses the status of the bond that holds the world’s body together (*in Tim.* II 15.13–30). The term ‘bond’ admits of three senses. These senses correspond to two of Proclus’ other triads.³⁵ There is the sense in which the bond between ingredients in a composite is the *transcendent cause* of that composite. This corresponds to the causal preparatory (*kat’ aitian*) mode of existence and this bond is unparticipated (*amethekton*). Proclus calls it the ‘creative (*poêtikon*) bond. Then there is the bond which is actually *in* the things that are held together by it and have the same order as it. This corresponds to existence through participation (*kata methexin*) and refers to the participants (*metechonta*). Proclus calls this the ‘organic’ bond. Intermediate between these is a bond that proceeds from the cause (and is thus unlike the first bond which *is* the cause) but also is manifested (*emphainomenos*) in the things that have been bound by it. This corresponds to the participated form (*metechomena*) that exists according to its own nature (*kath huparxin*).³⁶

Proclus insists that the bond under discussion in 31c4 is the intermediate sort of bond. While it is immanent in the things that are bound, it is nonetheless different from them. Since this is its role, what can we say about its causes? Like all things within the cosmos, its role allows us to see what higher levels of reality it symbolizes. Given its role as a unifier of things, it naturally descends from the One and from the One-Being of the second hypothesis of the *Parmenides*. But, of course, this doesn’t distinguish the bond in question from much else in Proclus’ ontology. It is more proximately derived from the All-Perfect Living thing and from an otherwise unspecified, transcendent cause of continuity (II 16.29). The result of all this is that this bond – or more specifically whatever it is that fills this role – is continuity and

³⁵ For an overview of these other triads, see Siorvanes (1996), 71–82; 88–99.

³⁶ Cf. *in Tim.* I 234,23 ff and *ET* 23 and 65.

harmony. This sort of bond makes different things ‘conspire together’ (lit. ‘breath together, *sympnoias*)

The first thing to fill the role of this bond within the cosmos is the Life that permeates it everywhere. Presumably this will be an emanation of the World Soul since, as a bond of the middle sort, it is inseparable from the things that it binds. But all soul is separable, since it is capable of reversion upon itself (*ET* 16). Is it Nature?³⁷ It seems not, since Proclus says that it is brought into being *by* Universal Nature (II 24.8–9) and presumably there is a difference between cause and effect. Perhaps we may say that it is ‘partial Nature’ since it is the bond of a particular or partial (*merikos*) body. It is certainly similar to Nature in as much as its role is to endow bodies with qualities.

While its exact order in the descent from the One may be unclear, it is clear that it will have certain features in common with proportion. First, while the Life of which Proclus speaks is not the World Soul, it is a consequence of the World Soul. The latter has within itself all the proportions that Plato discusses, including the geometric proportion that binds the four elements within the cosmos. This is a result of the way in which the Demiurge fills in the intervals between the double and triple series in the Soul (*Tim.* 35c–36b). Given the mechanics of procession, these proportions will be present in the Life in the manner of an image or representation (*ET* 65). So the Life in question is like geometric proportion by virtue of containing proportion – or at least an image thereof – within itself. Second, Proclus tries to argue that the physical analogue to proportion plays a role in the mechanism of procession and reversion that is similar to geometric proportion. Where we have a geometric proportion between, a, b, c, then $a:b = b:c$, and $c:b = b:a$. Proclus thinks that something like this happens with the procession of Life into the qualities of bodies and with their reversion upon their causes via Life.

... a bond of this sort provides procession and reversion to bodies: Beginning first from the middle because this is such as to connect and unify things (and it is defined in terms of this distinctive feature), but proceeding from the first through the middle to the last (in as much as it extends and develops itself

³⁷ By ‘Nature’ here I mean the weaker projection of World Soul that Plotinus’ identifies as the proximate cause of natural changes in III.8.3.

right down to the last things), and then running back up from the last to the first (in as much as it converts all things through harmony to the intelligible cause from which the division of nature and spatialization of bodies have come about). (II 26.4–11)

The argument is not entirely satisfactory since Proclus omits one important aspect of geometric proportion. In such a proportion, $b:c = a:b$. Hence Plato says ‘the middle becomes first and last’. But there seems to be no analogue of this feature of geometric proportion in Proclus’ discussion of the role of Life in the mechanics of procession and reversion.

In general, then, Proclus’ interpretation of Plato’s text in 31c–34b seems basically right. Plato does not propose to show that it *follows deductively* from the fact that two similar solid numbers require two middle terms to establish a geometric proportion, that the cosmos must contain two elements in addition to earth and fire. Rather, what Plato’s text presents is an argument by analogy: since things are like this between numbers, volumes and musical values of a certain sort, then probably things are like this between the elements too. Proclus attempts to strengthen that analogical argument in two ways. First, he gives a novel theory of the elements that makes them share certain interesting features with similar solid numbers. A consequence of this is that he presents a critique of Aristotle’s account of the elements and their number. Second, he tries to give an account of what it is in the case of the cosmos that plays the role of the proportion between numbers. It must be said that he does a better job with the first task than with the second. No one who is not already a neoplatonist will have much sympathy for the arguments that try to show that the putative single Life and Reason is like proportion. However, Proclus’ account of the elements and his arguments against Aristotle on the fifth element are worthy of serious consideration.

The cosmos as a visible god

The question of the nature and number of the elements, as well as the proportion that binds them together, dominates the first part of Proclus’ commentary in this volume. In the second part, Proclus moves on from the question of what the world’s body is made from and how it is composed to its nature as a unified object. This topic too is – properly considered – ultimately theological. For we must keep in mind that Plato’s

text makes the entire cosmos a *visible god* (*Tim.* 34ab; 62e; 92c). As such, of course, the cosmos enjoys a blessed and happy life, and Proclus is keen to show how the details of this divine being's body subserve the character of the life that it must lead.

It is easy to overlook or discount this pantheistic element in Plato's text.³⁸

There are other texts within the Platonic corpus that militate against the idea that *anything* with a body – whether it be the entire cosmos or merely the Sun – should be a god:

The whole combination of soul and body is called a living thing and has the designation 'mortal' as well. Yet it cannot have been reasoned to be immortal by any rational account. But we, though we have never seen or nor adequately conceived a god, imagine it as some immortal living thing, having both a body and a soul, these things being naturally conjoined throughout all time. But let these things and our words concerning them be as is pleasing to the gods. (*Phaedrus* 246c5–d3, my translation)³⁹

³⁸ The use of 'pantheism' in this context may raise some eyebrows. It is frequently thought that pantheism must be a form of monotheism. If this were so, then my use of the term here would surely be incorrect. Not only are there additional gods *external* to the cosmos – this is certainly true by Proclus' lights, and possibly by Plato's as well: it depends on whether one takes a realist attitude toward the Demiurge in Plato's account – but the *Timaeus* also claims that the stars and planets are gods. Thus the big god would seem to have minor gods within it. So if pantheism is *of necessity* a form of monotheism, then Plato is no pantheist. But it seems to me that there is no conceptual reason to insist that this is an analytic truth about 'pantheism'; cf. Baltzly (2003). Pantheists believe that the world or cosmos constitutes a whole that is divine. Plato believes that, and so does Spinoza. I think it obscures the important similarities to suppose that the latter is a pantheist but the former is not simply because Plato thinks that there exist *additional* divinities not identical to the cosmos.

³⁹ ἀθάνατον δὲ οὐδ' ἐξ ἑνὸς λόγου λελογισμένον, ἀλλὰ πλάττομεν οὔτε ἰδόντες οὔτε ἰκανῶς νοήσαντες θεόν, ἀθάνατόν τι ζῶον, ἔχον μὲν ψυχὴν, ἔχον δὲ σῶμα, τὸν αἰεὶ δὲ χρόνον ταῦτα συμπεφυκότα. ἀλλὰ ταῦτα μὲν δὴ, ὅπῃ τῷ θεῷ φίλον, ταύτη ἐχέτω τε καὶ λεγέσθω. I have provided my own translation here because I think that Woodruff and Nehamas' translation in Cooper goes a bit too far. They translate 'In fact it is a pure fiction, based on neither observation nor on adequate reasoning, that a god is an immortal living thing' etc. But 'pure fiction' surely overtranslates πλάττομεν. Cf. the relevant parallels cited in LSJ, *Rep.* 420c, 466a where the relevant sense seems only to be focusing on a certain segment of the population within the ideal state. Hence the LSJ gloss, 'to form an image of a thing in the mind; to imagine'. The absence of empirical evidence or good argument for thinking of gods as immortal living creatures does not yet show that this conception is a

Combining this explicit remark with the general tenor of Plato's comments on the condition of being embodied in *Phaedo* and *Phaedrus* generates a motive to hedge on the notion of visible, embodied gods. Platonists in antiquity took a couple of different tactics to try to alleviate this apparent tension.

We encounter one of these in Proclus' commentary: the gradations of the elements from which the bodies of the heavenly gods are composed are different from the gross sediments of earth, air, fire and water with which we are acquainted here in the sub-lunary realm. Unlike our bodies, the bodies of the stars and planets give them no difficulties. This tactic of differentiating the kind of body that constitutes the bodies of the heavenly gods (and, of course, the greatest proportion of the body of the single, all-encompassing cosmic god) goes back to the author of the *Epinomis*. *Epinomis* works with a theory of five elements, including aether (981c). A living creature is a composite of body and soul (cf. *Phaedrus* 246c). The kind of living creature, however, is determined by the predominance of one element over others. In mortal creatures, the element of earth predominates. The heavenly bodies, by contrast, are living creatures in which fire predominates over the other elements (981c, cf. *Timaeus* 40a). Because they are endowed with the finest bodies, they can be home to the best and most blessed and happy souls (981e). Now, Proclus will not accede to the idea that, strictly speaking, there is a *fifth* element, but he will accept that there are important qualitative differences between heavenly fire and the fire we have down here. These differences, and the differences in the vehicles of the souls, will explain how the heavenly gods can share in the condition of embodiment and yet live a life that is worthy to be regarded as divine.

There are other Platonist gambits for reconciling this tension that we do not find in Proclus. Consider the "stoicising" Platonism of Antiochus of Ascalon – a Platonism and a Stoicism heavily influenced by the *Timaeus*.⁴⁰ If we take some of Varro's fragments as evidence for Antiochus,⁴¹ then another tactic for reconciling the

fiction. Such a conception might be vouchsafed by the gods themselves or by tradition and thus lack the kind of logical or observational basis here discussed.

⁴⁰ Cf. Reydam-Schils (1999), 117–33.

⁴¹ Cf. Gersh (1986), 819.

tension is to give all the credit for the divinity of the cosmos to the World Soul. Varro allows that we may call the cosmos itself a god in the same way in which we may call a man wise. A man is wise in virtue of the wisdom within him. The cosmos is a god *in virtue of its soul* (ap. Augustine, *Civ. Dei.* VII.6). Since a man is not wise in virtue of anything other than wisdom, so perhaps we may infer that Antiochus and Varro held that the cosmos is not a god in virtue of anything other than its soul. Specifically, the character of the cosmos' body is only relevant to its status as a god in a negative way: an embodied god would have to possess a body that gave it no trouble – unlike the way in which our bodies impede our functioning. On this view, the most such a god's body could contribute to its divine status is to stay out of the divine soul's way!

This is not a tendency that we observe in Proclus. It is true that, among the ten gifts that the Demiurge bestows upon the cosmos, Proclus gives great weight to ensoulment with a divine soul. The soul is that which divinizes the cosmos 'straight-away' (*in Tim.* II 113.4). But we need not infer from this that the corporeal features of the god's body contribute nothing to its status. And, importantly, the god in question is the *visible composite* of body and soul (II 100.17), not merely the soul within.

Proclus' willingness to factor the character of the world's body into his account of the divinity of the cosmos is consistent with his rejection of the idea that matter is itself evil. Though Plotinus' views on matter are difficult and complex, it seems likely that Proclus takes his view to be that matter is evil in its essence (*de Mal.* 30.5-7). This is a position on the origins of evil that Proclus resists. Proclus offers several philosophical points against the view, but one of his most vigorous attacks on it comes from interpretive considerations. If we held Plotinus' view, we would be unable to accept the *Timaeus*:

If, however, matter is necessary to the universe, and the world, this absolutely great and 'blessed god' (*Tim.* 34b), would not exist in the absence of matter, how can one still refer the nature of evil to matter? (*de Mal.* 32.1-3, trans. Opsomer and Steel)

In general, the views of both Iamblichus and Proclus tend to be more 'world-affirming' than those of Plotinus.⁴² Proclus' insistence on the divinity of the visible

⁴² For Iamblichus, see chapter 1 of Shaw (1995). For Proclus' ethics, see Baltzly (2004).

cosmos and the role of its bodily features in making it a god is an index of this attitude.

So how, exactly, does the world's body contribute to its divinity? The proportion between the elements endows it with friendship or *philia* with respect to itself (*Tim.* 32b). This friendship that the cosmos has towards itself contributes to its preservation. So it is everlasting, not merely by the will of the Demiurge, but also because of the nature of its body (*in Tim.* II 53.25). The association between friendship and mathematical relations is a long-standing one in Greek philosophy – from Pythagorean “friendly numbers” to Aristotle's discussion of proportionality in the various forms of friendship (*EE* 1241b33). The cosmos' friendship with itself not only contributes to its divine perpetuity, but also to the quality of its life. Plato claims that ‘through the cosmos own excellence (*aretê*)’ (34b) the world is a friend to itself. Friendship of some sort is an important element in the happy life. Proclus claims that those who are genuinely virtuous can play the role of friends to themselves. They do not need others, for there is nothing within their own character that they wish to avoid by diverting their attention to anything external (*in Tim.* II 110.16–25). So in this way, the proportionality of the elements within the world's body plays a role in providing it with *philia*. This, in turn, contributes to its indestructibility and blessedness – two characteristics of a divine being.

Another contributing factor to the world's indestructibility is the fact that it is a ‘whole composed of wholes’ (*Tim.* 33a). As noted, it is a whole – and not a mere aggregate – by virtue of the proportion between its constituent elements. But it is also important that the Demiurge uses all the available earth, air, fire and water. This means that there is nothing outside the world's body that could hinder it. It is thus immune to age and disease through the influence of external factors. Proclus argues at length that the following three properties of the cosmos are such as to imply one another: its completeness, its singleness, and its perpetuity (II 58.20–61.14). It is complete in the sense that it contains the whole of each of the elements. Therefore, it is one of a kind, since there is nothing from which another cosmos could be made. Moreover, it will be everlasting, since there will be no external source for its decay or destruction. Alternatively, Proclus says, we could start from the fact that the world is single and argue to its completeness and perpetuity.

Each of these factors is implicated in the divinity of the cosmos. Completeness is one and the same with perfection: it is missing nothing. Perpetuity is, of course, expected in a god. Moreover, each god should be one of a kind. Among incorporeal gods such as the intelligibles or hypercosmic souls, there will be no matter to individuate them. If a visible god like the cosmos is thus to resemble higher gods in this respect, it will have to be *monogenês* or ‘one of a kind’. All these factors stem at least in part from a fact about the body of the cosmos. Or at least, the fact that there is nothing more outside the cosmos is the *material cause* of these attributes – of course, these facts are also determined by higher causes as well (*in Tim.* II 59.10–24). So here, then, is another way in which the world’s body is relevant to its status as a god.

But the fact that there is nothing external to the cosmos might also be thought to threaten its divinity. Since there is nothing external for the divine living being to see, touch or taste, it has no sense organs (*Tim.* 33c). Surely this will threaten its claim to be perfect or complete. After all, we think of eyeless creatures as inferior to those with eyes. Or we might suppose that an eyeless human is incomplete or mutilated. Moreover, because the universe has nowhere to go, nothing to grasp, and nothing external to it to eat, the Demiurge also “deprives it” of feet, hands and mouth (33c-d). How can this blessed god be really happy if it lacks so much that we have? Proclus takes this worry seriously. He will not deny that the cosmos has sense perception at all, in spite of the fact that sense perception is disparaged at various points in the Platonic dialogues. Rather, he argues that the unique living creature that is the cosmos has a form of perception that is superior to that which requires organs and is disaggregated into distinct sense modalities (*in Tim.* II 83.3–85.31). Proclus goes on to distinguish four species of perception, the lowest to be equated with the sort of perception that Plato gives to plants (*Tim.* 77b). The highest form of perception is that which is possessed by the cosmos, while the second highest is the form of perception had by the heavenly bodies. The cosmos’ perception most closely resembles the activity of intellect. It has no object external to itself. It is not discursive, nor does it proceed outside itself. The closest analogy is with consciousness (*sunaisthêsis*). Presumably Proclus means that the cosmos has an awareness of its own inner goings on in the same way that we have an awareness of ours, save that it lacks the element of discursiveness. In any event, the fact that the visible god has sense perception is

further evidence that Proclus does not suppose that the conditions of embodiment are incompatible with divinity and blessedness.

Finally, there is a sense in which the *absence* of sense organs, organs of movement, as well as organs of ingestion and excretion, constitutes the material cause of the cosmos' divine self-sufficiency. Along with completeness, self-sufficiency is a distinguishing property of the visible god (*Tim.* 68e). Plato makes the point that the cosmos is self-sufficient because it provides its own nourishment and because all that it undergoes, it undergoes through its own agency (33d). The final and paradigmatic causes of this self-sufficiency reside in the Demiurge's goodness. But just as the absence of anything external to the cosmos is the material cause of its completeness, so too we may infer that the absence of these organs is the material cause of its self-sufficiency. If cosmic self-sufficiency contributes to the status of the cosmos as a god, then its organless condition is at least a material cause of the former.

The shape of the cosmos also contributes to its divinity. The sphere is the figure that is most complete and most similar to itself. By 'similar to itself' Proclus means that the parts of the sphere are all 'like one another' (*homoioimerês*). The sense in which this is so emerges when the sphere is contrasted with cylinders or cones that are composed from parts that are unlike one another (*in Tim.* II 75.5–15). The sphere's claim to completeness or perfection rests on the fact that it is circular. Straight lines admit of being indefinitely extended, but what is circular is complete in the sense that it comes back around upon itself (*in Tim.* II 78.11). The fact that the spherical shape is thus most similar to itself means that it is maximally unified, and to the extent that a thing is unified it imitates the One and is made divine.

Finally, the sixth gift of the Demiurge to the cosmos is a motion that resembles Intellect: it is a sphere turning on its axis. The similarity of this motion in place to the activity of Intellect is asserted in Plato's *Laws* 898a. The grounds for the similarity are easier to state than to understand: both intuitive thought (*noêsis*) and the motion of the sphere are 'moving regularly and uniformly in the same spot, around the same things and in relation to the same things, according to one *logos* and a single order'. Proclus' discussion of this comparison is very brief, considering only individual words of the lemma at 34a. Whatever the exact points of the comparison, the objective is clear. Here is yet another property of the cosmic soul-body composite

that assimilates it to its paradigm in the Intellect. To the extent that it is thus made like or assimilated, it too is divine.

Far from dismissing the corporeal aspects of the cosmic composite as gross accretions to the World Soul, Proclus regards the body of the world as a beautiful object of contemplation. Its physical features contribute to the divine and blessed life of the cosmic being. When we seek the happy life by assimilating ourselves to the moral model of the cosmos (*Tim.* 90d), we must understand not only the psychic-mathematical aspects of it, but we must also understand it physically for the dialogue concerns both these aspects (*in Tim.* II 20.19–21).

Proclus' engagement with mathematics and astronomy

As we noted in the general introduction to this series, the lectures on the *Timaeus* – together with those on the *Parmenides* and the *Philebus* – form the capstone of the neoplatonic curriculum. The status of the *Timaeus* commentary as an advanced work is evinced in the way in which Proclus seeks to reconcile its content with other sacred texts, such as the *Oracles*.⁴³ Proclus also draws on considerations from mathematics and astronomy. Here he sometimes gives some basic exegesis, but not a great deal. This is particularly true of the section of the text in which he briefly relates some arguments for the sphericity of the cosmos.

This passage warrants some attention, since it shows us something about Proclus' epistemological presuppositions. When it comes to proving that the cosmos is spherical in shape, the first thing we should consider is the Platonic demonstration. This, he tells us, is a real demonstration, since it includes the explanation or reason why (*to dioti*) as well as the simple fact (*to hoti*). The terminology is clearly that of Aristotle's theory of demonstration (*apodeixis*).⁴⁴ Curiously, this 'demonstration' (twice used in the singular) is three-fold. When these three parts are presented, each

⁴³ Consider, for example, the passage at II 57,9–58,11 where Proclus considers how Plato's cosmology can be understood consistently with the *Oracles*. Knowledge of the cosmology of the *Oracles* is simply presupposed.

⁴⁴ Cf. *An Post.* I.13, 78a22 ff.

appears to be a distinct argument. Moreover, each of the three breaks down into further considerations that are at least three in number – a fact that Proclus explicitly notes (*in Tim.* II 68.24). It must be said that it is not easy to formulate each of these three arguments as three syllogisms. Rather, each argument works with three considerations or elements. So, in the first (the demonstration from the One) Proclus considers three unified things: the One, the Demiurge and the single Living Being Itself. The sphere is said to play a similar role to each of these in the case of figures. The One is inclusive of all the henads. The Living Being Itself is inclusive of all the many intelligible living beings. The single Demiurge is inclusive of all the many causes. Now, the sphere is the figure within which all the regular solids can be inscribed. So this must be the shape of the cosmos, since this shape plays the same role in relation to extended figures that the One, the paradigm and the Demiurge play in relation to intelligibles.

This is not a demonstration in the Aristotelian sense at all. Indeed, it is best presented as a proportion: as *a* is to *b* so *c* is to *d*. Nor is the second of the three-fold Platonic demonstrations, though it more closely approximates the form of a demonstration. In this argument, the spherical shape of the cosmos is again demonstrated from three factors. Such a shape is fitting (*prepein*) to what receives the outflow from above. It is fitting to the being that gives existence to the cosmos (i.e. the Demiurge). And finally, the spherical shape is fitting or appropriate to the paradigm upon which the cosmos is modelled. Take the first of these considerations.

It is fitting to the one who receives. Because it is perfect or most complete, it is amicable (*philos*) to the most perfect of the shapes; and that which includes all things (i.e. cosmos) is amicable to the figure that encompasses all other figures (i.e. the sphere). (II 69.11–13)

There are many ways in which we could try to present this argument as one or more standard syllogisms. But it is not easy to see which term is supposed to be the explanatory middle term: that is, the term that figures in both premises, but not in the conclusion, whose relation to major and minor term *explains why* the conclusion holds.

Another feature of Aristotelian demonstrations is the status of the premises. In a proper demonstration, the premises must be prior to the conclusion, better known, and such that they could not be otherwise (*An Post.* I.2). Yet in the next proof, Proclus

needs the premise that the intelligible cosmos which is the paradigm for the visible one ‘converges in every way into itself’ like the shape of a sphere. One might well wonder whether it is obvious that this premise meets these conditions. In any event, Proclus appeals to the texts of Parmenides and Empedocles, rather than something even better known, as evidence for this premise.⁴⁵

So it seems that Proclus’ ‘Platonic demonstrations’ fall short of the standard that they so conspicuously advertise for themselves. Should we conclude that Proclus is simply incompetent as a philosopher? Elsewhere Proclus is quite capable of producing rigorous arguments. But this still leaves it a mystery why the arguments that are here dignified as *demonstrations* of a certain sort by the quite explicit use of Aristotelian terminology seem to fall short of the standards set down in Aristotle’s works for a proper *apodeixis*. The neoplatonists generally – and one must assume that Proclus as well – understand and approve of the theory of demonstration.⁴⁶ However, it seems at least possible that he supposes that these arguments which involve proportion⁴⁷ (e.g. as the Demiurge is to the causes of the cosmos, so is the sphere to all the regular solids that may be inscribed within it) and reference to “higher causes”

⁴⁵ It is perhaps possible that Proclus regards this as a common conception (*koinon ennoion*). Such common conceptions seem to form the starting points of demonstration on his understanding. Cf. *in Parm.* 1092.29–32; *in Euc.* 74.15)

⁴⁶ We have no commentary from Proclus on the *Posterior Analytics*, nor evidence of any commentaries on the works of Aristotle – though there can be little question that the author of the *Timaeus* commentary and *Elements of Physics* knows his Aristotle pretty well. His Euclid commentary evinces a good grasp of Aristotle’s requirements on demonstration (*in Euc.* 76.1–72.2; 206.12). My rather speculative remarks in might be confirmed (or undermined!) by a careful study of Philoponus’ *Posterior Analytics* commentary. The commentary is drawn from the lectures of Proclus’ student, Ammonius, with some additions by Philoponus.

⁴⁷ Some of Plato’s most enigmatic and tantalizing remarks from the *Republic* use the language of proportion and they do so in a context in which we build up to the idea of dialectice as a distinctive method by means of which the Forms are grasped (508b13–c2; 510a9–10). Proportion shows up again in *Timaeus* 32b in the case of the four elements: ὅτιπερ πῦρ πρὸς ἀέρα, τοῦτο ἀέρα πρὸς ὕδωρ, καὶ ὅτι ἀἴρ πρὸς ὕδωρ, ὕδωρ πρὸς γῆν. Proclus uses such analogia formulations extensively. Examples from the *Timaeus* commentary alone include: I 17.27; 75.9; 345.3; 371.31; 405.21; 406.17; II 130.20; III 27.20; 28.11; 138.1; 174.29.

(such as the One or the intelligible paradigm) are more elevated than your work-a-day Aristotelian demonstration. The fact that there are supposed to be three arguments, each having three further sub-arguments may be significant as well. Following his account of the Platonic demonstrations, Proclus relates eight (or perhaps ten) Iamblichean conceptions.⁴⁸ The mere fact that these arguments have these numbers – three three-fold arguments, then a decad of arguments – may have been taken as itself an indicator of their superiority. Proclus says that the arguments thus far considered show the sphericity of the cosmos in a philosophical manner (*philosophôs*). Proclus then assembles a series of Aristotelian arguments that attempt to prove the point in a physical manner (*physikôs*). Finally, if it is necessary to belabour the point, says Proclus, we can pass on to mathematical demonstrations. However, he does not thereby invert the normal neoplatonic order which places numbers and mathematical entities prior to *phusis* or nature. Rather, the ‘mathematical demonstrations’ are in fact extremely brief summaries of astronomical arguments for the sphericity of the cosmos. These demonstrations summarise the things that are *believed* (*ta dokounta*) by those who are wise in these matters.⁴⁹ The general tenor of the whole discussion is that we have passed from the very best reasons for accepting the sphericity of the cosmos – the considerations in a philosophical manner – to those that actually show us the least.

Are we here starkly confronted with the fact that Proclus is a Platonist rather than an Aristotelian – that is, that he prefers the ‘higher and more elevated’ causes to the concrete physical demonstrations of astronomy? *We* make a sharp distinction between the philosophical spirit of Plato and that of Aristotle. But the neoplatonists regard Aristotle as a member of their school – that is, he is properly a Platonist, just as they themselves are Platonists. (Though the point has been made frequently before, it is important to remember that the label ‘neoplatonism’ is a modern moniker.) As such,

⁴⁸ Proclus, *in Tim.* II 72.6–73.26 = Iamblichus, *in Tim.* frag. 49 (Dillon). The individuation of arguments within this passage is not clear. Dillon suggests that perhaps there might originally have been ten, since this would be a more proper number for a Pythagorean.

⁴⁹ As with the arguments drawn from Aristotle in the previous section, the five arguments of 75.19–76.29 are not original with Proclus. Close versions of several of them are identified by Festugière in the works of Geminus, Cleomedes, and Theon of Smyrna.

Aristotle agrees with Plato on most matters. We may think of this as a gratuitous misrepresentation of Aristotle. But is it?

Just as Plato's dialectic works downward from an unhypothetical first principle to lower forms, so too Aristotle draws a distinction between those things are clearer to us and those that are clearer by nature.⁵⁰ What is clearer by nature is, in fact, more universal and abstract. A writer such as Proclus will interpret these Aristotelian claims in the following way: we may *begin* by finding the concrete arguments for the sphericity of the cosmos more intellectually compelling, but we should *end* by finding these reasons less clear than what is actually prior in nature. Platonic principles such as the One, the Demiurge and the paradigm are prior in nature. So at the end of the day, the arguments from considerations about these entities will be clearer by nature. This is just the 'harmony' that the neoplatonists claim exists between the teachings of Plato and those of Aristotle.⁵¹ Lloyd Gerson has recently argued that this harmony is not in fact a ridiculous distortion.⁵² Rather, we can see Aristotle in an interesting new light if we go looking for the points of similarity and contact between his views, Plato's, and those of subsequent Platonists. To be sure, there are points of difference as well – and even Proclus and some of the other neoplatonists recognise this fact. Reading Plato and Aristotle through the lens of Proclus' commentary challenges our tendency to accentuate the differences between them.

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⁵⁰ *An Post.* I.2, 71b34

⁵¹ For a survey of the range of views on the agreement of Plato and Aristotle, see Sorabji (1990), 3.

⁵² Gerson (2005).

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