PROCLUS

COMMENTARY ON PLATO'S *TIMAEUS*

VOLUME III

Book 3 Part 1
Proclus on the World's Body

EDITED AND TRANSLATED BY
DIRK BALTZLY

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Commentary on Plato's Timaeus

Proclus' Commentary on Plato's dialogue *Timaeus* is arguably the most important commentary on a text of Plato, offering unparalleled insights into eight centuries of Platonic interpretation. This edition offers the first new English translation of the work for nearly two centuries, building on significant recent advances in scholarship on Neoplatonic commentators. It provides an invaluable record of early interpretations of Plato's dialogue, while also presenting Proclus' own views on the meaning and significance of Platonic philosophy. The present volume, the third in the edition, offers a substantial introduction and notes designed to help readers unfamiliar with this author. It presents Proclus' version of Plato's account of the elements and the mathematical proportions which bind together the body of the world.

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TRANSLATED WITH AN
INTRODUCTION AND NOTES BY

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This volume has benefited from the attentions of two very good research assistants: Tim Buckley and Fiona Leigh. The eagle eyes of Muriel Hall, CUP's diligent copy-editor, have caught many embarrassing mistakes on my part. I am also indebted to my collaborators on this project, Harold Tarrant and David Runia, who have each read portions of the draft translation and helped me with several thorny passages. John Bigelow has lent me his expertise in ancient mathematics and astronomy, as well as his acute sense of what, *a priori*, it makes sense for Proclus to be saying about these matters. Jim Hankinson and Ian Mueller (who have been working on Simplicius' *de Caelo* commentary) and Robert Todd and Alan Bowen (who have just completed a translation and commentary on Cleomedes) have allowed me to pick their brains on various topics in natural science. Finally, I owe an enormous debt of gratitude to Richard Sorabji from whom I learned much about the Neoplatonic commentators when I was at King's London, and who has kindly given me draft versions of his forthcoming 3-volume set of sourcebooks on the commentators.

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 humour 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.

Note 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, (1966–8). 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 or 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), Morrow (1970), Morrow and Dillon (1987), O'Neill (1965). 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 World*, appeared in 1987. There are a projected 60 volumes including

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. His page numbers and line numbers are reproduced in the margins; the page numbers are in bold. 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 (*noêtos*) 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 in the corresponding Greek text the noun is in the dative or the verb a finite form. This allows the Greekless reader to recognize 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 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

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 Macro (2001). Cf. the first translation of the reply to Proclus by the Christian Neoplatonist, Philoponus, Share (2005).

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 the plural 'vehicles' is followed by the singular form of the Greek noun. Equally, Greekless 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 summarized as follows. We use the diaeresis for internal breathing, so that 'immaterial' is rendered *aÿlos*, not *ahylos*. 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 *ôiogenês* for ᾠογενής. 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: *proödos*, 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. Hildesheim: Olms, 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*, vols. 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: Les Belles Lettres, 1968–97)
de Aet. = *Proclus: on the Eternity of the World*, ed. H. Lang and A. D. Macro (Berkeley: University of California Press, 2001)
de Mal. = *De Malorum Subsistentia*, ed. H. Boese (Berlin: De Gruyter, 1960), trans. J. Opsomer and C. Steel, *Proclus: On the Existence of Evils* (London: Duckworth, 2003)

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: Istituto 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: Weidmann, 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 need 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 Book 3

THE STRUCTURE OF BOOK 3 OF PROCLUS' COMMENTARY

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 3 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 3 as a whole, the translators have taken the decision to dedicate a volume each to the body and soul of the universe (volumes III and IV respectively). The final volume of our series (volume V) will condense into one the translation of Books 4 and 5 of Proclus' commentary – equivalent to the third volume in the Teubner series of Proclus' text.

The question of the *skopos*[1] or target of the *Timaeus* in general is taken up in the introduction to volume I. 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 sublunary 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).[2] 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 'visible god' (34ab). Thus from Proclus' point of view, the *Timaeus* is actually a profoundly *theological* work.

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

[2] 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 1 and 2 (= Diehl vol. I).

In Book 3, 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 in this section of the text what the Demiurge is said to do 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. The cosmos is perceptible by virtue of being composed of fire and earth. The nature of these elements requires 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 fourfold All-Perfect Living Being (*Tim*. 39e–40a).

This theme of ten Demiurgic gifts is carried forward from Book 3 through Book 4 and serves as one of the means by which Proclus organizes his discussion of Plato's text. It allows him to develop further what he sees as the physico-theological character of the dialogue, since it organizes 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 3. Another theme that Proclus pursues in Book 3 is that of the contrast between wholes and parts.

At the outset of Book 1, Proclus specifically identifies ways in which Plato investigates *physiologia*. At different points it may seek these matters in *images*, at 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 1 and 2, 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 2 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 3, Proclus revisits the theme of wholes and parts which has hithertofore been less obvious. We can conceptualize the creation of the universe as a sequence of foundational acts (*hypostasis*). 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' (*holon 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 dêmiourgia*) 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 a continuous 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 organizing schema of the ten gifts to the cosmos, the three foundations are thematic – not narrative.

What of the cental 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 3.[3] 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.[4] 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.[5] So one way to think of 'a whole composed of wholes'

[3] In particular, see II. 281.23–30. Here too we are told that the creation of the universe is threefold. 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 (*merikôn zôôn*). These are the heavenly, aerial, terrestial and aquatic kinds of *Timaeus* 39e–40a.

[4] Cf. *Phys.* 1.1, 184a24, 'a universal is a kind of whole, comprehending many things within it, like parts'.

[5] 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.

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.[6] This is a whole which includes the wholes 'being a heavenly living being', 'being a terrestrial living thing' and so on.

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

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

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 organized. Let us now turn to some of the important points that he purports to find within this framework.

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.[7] 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 aspect.[8]

On one hand, Proclus criticizes 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 characterized by three defining properties – not two, as in Aristotle's theory. Among fire's defining properties is being easily moved. By contrast, earth

[7] 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).

[8] These ideas are pursued in more detail in Baltzly (2002).

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*.

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–b.

- In 34a–b, 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 underlining.)

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, *VProc.* 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 reawaken 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 fifth-century AD Platonism can do so by having Nicomachus' *Introduction to Arithmetic* and Theon of Smyrna's *Mathematics Useful for Understanding Plato* at hand. Nicomachus of Gerasa was a Neopythagorean philosopher of the first or early second century AD. 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.21–9). 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,[9] 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 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.[10] 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.[11] In fact, Marinus tells us that Proclus supposed that he had *been* Nicomachus in a previous life (*VProc.* 28)!

What do these mathematical treatises tell us about the geometric, arithmetic and harmonic proportions?[12] The term that is used most

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

[10] O' Meara (1989), 148.

[11] 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.

[12] The history of the proportions is discussed in Heath (1921) vol. i, 85–90. The earliest definitions reported are those of Archytas in a fragment of his work *On Music* preserved

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.[13] 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.

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.[14] 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.[15] 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 ½ of 2. Likewise, the 6 exceeds the middle term by 3 which is likewise ½ of 6. So in the harmonic proportion, the middle term exceeds and is exceeded by the 'same part' of the extreme terms.[16]

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).

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

[14] [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.

[15] '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.

[16] '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

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 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 (*monoeidês*), 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.

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, however, has been the subject of dispute. 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" (31c4–32a7). (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

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.

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 7, def. 16: 'when two numbers multiplied together produce a third, the number so produced is called *plane* (*epipedos*), and the numbers which were multiplied are called its *sides* (*pleurai*)'. A number that is the product of three factors is called 'solid'. Euclid 7, def. 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 (def. 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 (def. 19). Finally, there is the terminology of *similar* numbers. Planes or solids are similar when their sides are in proportion (Euc. 7, def. 21). That is to say, if a × b and c × 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.'[17] 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 (Euc. 8, props. 11, 12). But this property is not limited to square and cube numbers: it is also true of *similar* planes and *similar* solids (Euc. 8, props. 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 (Euc. 8, prop. 20) and the existence of two means in geometric proportion is a sufficient condition for the extreme terms being similar solids (Euc. 8, prop. 21). So much for the facts of the matter – the *pragmata* as Proclus would say. Let's return to Plato's text.

[17] Theon of Smyrna, 37.4 (Hiller).

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 to each other, and given this, all of them will be unified. Therefore if the body of the universe had 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.[18]

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 *dynameôn*, the middle one is such that . . .[19]
2. Whenever of any three numbers, the middle one between any two which are *ongkôn* or *dynameôn* . . .[20]
3. Whenever of three numbers or *ongkôn* or *dynameôn*, the middle is such that . . .[21]

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 *dynameis* in question are, and to a lesser extent the *ongkoi*. The problem is that the term *dynamis* (or *dynameis*, plural) can mean a power like heat. (In particular, among Neoplatonists like Proclus, it is frequently used as a word for property). In specifically mathematical contexts it means a square root or square number. But '*dynamis*' finds

[18] The text reads: ὁπόταν γὰρ ἀριθμῶν τριῶν εἴτε ὄγκων εἴτε δυνάμεων ὡντινωνοῦν ᾖ τὸ μέσον, ὅτιπερ τὸ πρῶτον πρὸς αὐτί, τοῦτο αὐτὸ πρὸς τὸ ἔσχατον, καὶ πάλιν αὖθις, 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 ἀμφότερα, πάνθ' οὕτως ἐξ ἀνάγκης τὰ αὐτὰ εἶναι συμβήσεται, τὰ αὐτὰ δὲ γενόμενα ἀλλήλοις ἕν πάντα ἔσται. εἰ μὲν οὖν ἐπίπεδον μέν, βάθος δὲ μηδὲν ἔχον ἔδει γίγνεσθαι τὸ τοῦ παντὸς σῶμα, μία μεσότης ἂν ἐξήρκει 32.b τά τε μεθ' αὑτῆς συνδεῖν καὶ ἑαυτήν, νῦν δὲ στερεοειδῆ γὰρ αὐτὸν προσῆκεν εἶναι, τὰ δὲ στερεὰ μία μὲν οὐδέποτε, δύο δὲ ἀεὶ μεσότητες συναρμόττουσιν.

[19] This option takes the genitives εἴτε ὄγκων εἴτε δυνάμεων with ἀριθμῶν τριῶν.

[20] This option takes the genitives with τὸ μέσον.

[21] This option treats all three terms as linked by an implicit εἴτε before ἀριθμῶν.

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 *dynameôn*. 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.[22] 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 *dynameôn* as 'square numbers'. This is the option that Cornford took in his translation and commentary on the *Timaeus*.[23] 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 *dynameôn* in this passage means 'square number' – and finds the evidence wanting.[24] This being so, it is perhaps just as well that Proclus takes the third syntactic alternative.

This alternative is represented in the modern literature by Taylor.[25] Taylor cites Proclus *in Tim*. II. 22.18 and claims that he is correct to construe Plato as discussing three alternatives – numbers, volumes and *dunameis* – in which the middle term may be such that 'what the first term is to it, it is to the last, and, conversely, what the last is to the middle, it is to the first' (32a1–4). Taylor also assumed, however, that all three proportions are under discussion here: the arithmetic, the geometric and the 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 *dynameis*. 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 pertain *especially* to the corresponding substrates

[22] Heath himself points this out. Heath (1921) vol. i, p. 89.

[23] Cornford supposed that the first objection that Heath himself considered 'can be obviated by construing the genitives εἴτε ὄγκων εἴτε δυνάμεων ὡντινωνοῦν 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·

[24] Pritchard (1990). [25] Taylor (1928).

of numbers, magnitudes and pitches, but not *exclusively*. Moreover, while Proclus recognizes 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, the geometric of magnitudes, and the harmonic of musical values.[26] Even so, the proportion under discussion in the 32b9–32c4 passage is geometric proportion.
3. Between any two similar planes or squares, a single middle term is sufficient to establish geometric proportion.
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-à-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

[26] 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.

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 *dynameis* 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 *dynameis* 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 the proportions are realized 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.

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 ($3 \times 4 \times 6$) each take two sides from the extreme closest to them and one from the extreme further away. But 12, 16, 72, 96 do not form a continuous geometrical proportion. Of course,

Proclus' method will also produce 24 (2 × 2 × 6) and 48 (2 × 4 × 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 (*dynameis*) 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 particles	bluntness	easy mobility
Earth	density or thickness of particles	bluntness	difficult to move[27]

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

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.

> 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 counterparts to musical values or powers (*dynameis*) are the qualities (*poiotêtes*) that connect bodies and make them have form. These 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* 1.2. 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.

The life of the cosmos as the analogue 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 analogue 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.[28] 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' (*poiêtikon*) 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' hyparxin*).[29]

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 Being 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 harmony. This sort of bond makes different things 'conspire together' (lit. 'breathing together', *sympnoia*).

[28] For an overview of these other triads, see Siorvanes (1996), 71–82, 88–99.

[29] Cf. *in Tim*. I. 234,23 ff. and *ET* 23 and 65.

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?[30] 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, and 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 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). (*in Tim*. 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

[30] 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.

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.[31] There are other texts within the Platonic corpus that militate

[31] 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

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 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)[32]

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 sublunary 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

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'; see 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.

[32] ἀθάνατον δὲ οὐδ' ἐξ ἑνὸς λόγου λελογισμένου, ἀλλὰ πλάττομεν οὔτε ἰδόντες οὔτε ἱκανῶς νοήσαντες θεόν, ἀθάνατόν τι ζῷον, ἔχον μὲν ψυχήν, ἔχον δὲ σῶμα, τὸν ἀεὶ δὲ χρόνον ταῦτα συμπεφυκότα. ἀλλὰ ταῦτα μὲν δή, ὅπῃ τῷ θεῷ φίλον, ταύτῃ 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 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.

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 "stoicizing" Platonism of Antiochus of Ascalon – a Platonism and a Stoicism heavily influenced by the *Timaeus*.[33] If we take some of Varro's fragments as evidence for Antiochus,[34] then another tactic for reconciling the 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*. 7.6). 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 would be 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

[33] Cf. Reydams-Schils (1999), 117–33. [34] Cf. Gersh (1986), 819.

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.[35] Proclus' insistence on the divinity of the visible 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

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

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 any 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 possessed 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' (*homoiomerês*). 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 the *Commentary* in volume I of 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 *Chaldean Oracles*.[36] 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*).[37] Curiously, this 'demonstration' (twice used in the singular) is threefold. When these three parts are presented, each 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.

[36] 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.

[37] Cf. *An. Post.* I.13, 78a22 ff.

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 threefold 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). (*in Tim.* 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 the 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.* 1.2). 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.[38]

[38] 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 in his theory of knowledge. Cf. *in Parm.* 1092.29–32, *in Euc.* 74.15.

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 Proclus as well – understand and approve of the theory of demonstration.[39] It seems at least possible, however, that he supposes that these arguments which involve proportion[40] (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" (such as the One or the intelligible paradigm) are more elevated than your workaday 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.[41] The mere fact that these arguments have these numbers – three threefold 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

39 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 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.

40 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 ἀὴρ 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.

41 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 may originally have been ten, since this would be a more proper number for a Pythagorean.

mathematical demonstrations. He does not, however, thereby invert the normal Neoplatonic order which places numbers and mathematical entities prior to *physis* or nature. Rather, the 'mathematical demonstrations' are in fact extremely brief summaries of astronomical arguments for the sphericity of the cosmos. These demonstrations summarize the things that are *believed* (*ta dokounta*) by those who are wise in these matters.[42] 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 '*Neo*platonism' is a modern moniker.) As such, 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 that are clearer to us and those that are clearer by nature.[43] 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 ultimately it is the arguments from considerations regarding these entities that will be clearer by nature. This is just the 'harmony' that the Neoplatonists claim exists between the teachings of Plato and those of Aristotle.[44] Lloyd Gerson has recently argued that this harmony is not in fact a ridiculous distortion.[45] Rather, we can see Aristotle in an

[42] 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.

[43] *An. Post.* 1.2, 71b33.

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

[45] Gerson (2005).

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 recognize this fact. Reading Plato and Aristotle through the lens of Proclus' commentary challenges our tendency to accentuate the differences between them.

On the Timaeus *of Plato: Book 3, Part 1*

Proclus on the Worlds Body

Analytical table of contents

Proclus *in Timaeum* II.1–102

On the Timaeus *of Plato: Book 3, part 1*

Introduction: the ten gifts of the Demiurge

The account looks at the cosmos in two ways.[1] In the first way, it looks 1
at the cosmos according to the *wholeness* (*holotês*) that is in it and by virtue of which it is also similar to the All-Perfect Living Being (30c3) and has become itself **an ensouled living thing, possessed of intellect and uniquely generated** (30b8). But in the second way, it looks at the cosmos according to the *divisions* that are drawn within it. It reviews when the soul is distinguished from the body and when the order (*taxis*) 5
of things that are more like form is distinguished from those things allotted a more material nature, and it examines, on the one hand, how that which is corporeal (*to sômatoeides*) has been established and what kind of order it possessed, and on the other, it looks at how the psychic realm (*platos*)[2] has proceeded from the creation and in accord with what sort of ratios.

Since the cosmos has been exhibited to be 'an ensouled living thing possessed of intellect', there will be three things in it: 10
body, soul and intellect. Now Intellect is entirely ungenerated, having been allotted both an eternal essence (*ousia*)[3] and eternal activity

[1] The organizing themes and the corresponding divisions of Plato's text that Proclus makes are discussed in the Introduction (pp. 1–6). As Lernould (2001), 81–101 notes, Proclus gives several accounts of the phases in which the dialogue proceeds (I. 4.6–6.16; II. 1.1–3.28 and 5.17–31; III. 97.5–98.13; III. 242.9–243.5). It is an interesting question whether all these divisions of Plato's text are quite consistent with one another. In general, the theme of the ten gifts of the Demiurge (see below, II. 5.17–31) is the dominant one in this part of Proclus' commentary. The theme of a distinction between wholes and parts is invoked frequently, but less systematically.

[2] Festugière refers us to *ET* 176.8 (Dodds) and *in Tim*. I. 11.12; 37.26 and 257.7 for parallels.

[3] I have translated *ousia* as 'essence' where it seems clear that Proclus intends something like a thing's definable nature. However, the *Timaeus* commentary also speaks of the *ousia* of the soul in contexts where Proclus is discussing the mixture of Being, Sameness and Difference from which the Demiurge constructs the soul. Here, as in Stoicism (Stobaeus I. 177.21–179.17), it comes closer to the sense of substrate or the seventeenth-century use of 'substance'. In order to capture this sense, I will sometimes use 'substance' for '*ousia*'. Finally, Proclus uses '*ousia*' when he is referring to the Greatest Kinds or *megista genê* of the *Sophist*. Here I use 'Being'.

(*energeia*).[4] The world's body is entirely generated since it has been established as temporal through and through.[5] Soul, however, has an essence of an intermediate nature. So just as it is arranged as intermediate between divisible and indivisible things, in this manner it is also the boundary between generated and ungenerated things, having a beginning that is generated in relation to intellect but being ungenerated in relation to corporeal nature. It also has this status by being the limit of eternal beings but the very first among the things that have been generated.[6]

On account of these facts, therefore, Plato provides a varied generation of the body [of the universe], producing the whole thing out of what is foreign to the body itself. The Soul he produces from itself, as well as producing it from the total creation and process of enlivening (*zôiogonikês*). But in the case of Intellect, Plato contrives no generation of it in his account. This is because Intellect is not produced in relation to any model,[7] nor does the term 'generated' apply to Intellect in any way whatsoever since it is entirely ungenerated and eternal. It is manifested from the wholes, nonetheless by remaining in them inseparably (*anekphoitêtos*) it proceeds while being united to its more universal causes.

[4] The threefold distinction between *ousia*, *dunamis* and *energeia* is another part of the architectonic of Proclus' commentary in Book 3. The soul, for instance, is first discussed in terms of its *substance* or essence – the mixture of divisible and indivisible Being, Sameness and Difference from which it is blended (*in Tim*. II. 147.19–166.14) and their harmony and form (II. 166.15–257.29) – and then in terms of its *powers* (II. 257.30–279.17) and *activities* (II. 279.19–316.4). Though the triad of essence, power and activity is a popular one among the Neoplatonists, the terms are never explicitly defined nor distinguished from one another. Their presence, however, provides Proclus with more levels at which distinctions can be drawn between things that are, on the surface, quite similar. So, for example, in *Elements of Theology* intellects are eternal in respect of their essence, powers and activities (*ET* 169), while souls have an eternal essence but activity in time (*ET* 191).

[5] ὅλον καθ' ὅλον, cf. Philoponus, *in Phys*. 506.17.

[6] This Neoplatonic fancy footwork, of course, responds to a tension in the Platonic corpus itself. On the one hand, the *Timaeus* presents us with some sort of "generation" of the World Soul, as well as the souls of individuals. Yet *Phaedrus* 245c argues that the soul is ungenerated. Proclus' metaphysics of intermediates between levels of being provides the form of a general solution. Where *y* is the intermediate between *x*, which is F, and *z* which is not-F, *y* is said to be F in relation to *z*, but not-F in relation to *x*. For the application of this principle to the case of Soul, see II. 233, ff.

[7] Festugière refers us to III. 209.18. There Proclus discusses 'father of works' applied to the Demiurge (44a7). Proclus makes the point that the Demiurge cannot accurately be said to be the father or maker of intellects, 'for they had no genesis but were made manifest in an ungenerated fashion . . . for there are no paradigms in their case, though there are in the case of souls and of the things that come last in procession (i.e. bodies). Soul is the first of the things that are images, but the wholes, such as animals, . . . result from intellectual paradigms.'

Hence it abides in a partless and indivisible condition, being preserved by the immaculate divinities and 'implacable' powers,[8] while the rest of life is shared out and divided among the parts of the universe.[9]

Therefore Plato has provided the initial foundation (*hypostasis*) of the universe with reference to the wholeness it has from its creation, according to which it was completed as something ensouled, possessed of intellect and divine through its resemblance to the All-Perfect Living Being. But he will then add a second [foundation] that divides the cosmos by wholes and brings about the creation of whole parts – that is, both the psychic substance and that which is corporeal considered in themselves. For, as we just said, Intellect is entirely ungenerated (1.11) and indivisible[10] except insofar as even it proceeds without generation from the providence of the Demiurge. And Plato describes too the nature that is going to receive intellect, showing[11] that it is the nature of soul itself, since the Demiurge himself will place within it the circles of the soul, revealing it without division, because it is indivisible and without shape because it is entirely devoid of shape. 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' (*sômatourgikos*)[12] activity of the Demiurge. But even in

[8] Cf. *Chaldean Oracles* 36 (Majercik). Majercik uses the same numeration of the fragments as Des Places in his Budé edition. References to the *Oracles* in Festugière and Diehl are to the edition of Kroll. In this translation, I will follow the Majercik/Des Places editions.

[9] This is all very obscure. Festugière supposes that it relates to the fact that all eternal entities are 'simultaneous wholes' (*ET* 52). This is possible, but not obvious. The general sense, I think, relates to the problem of participation and gestures vaguely towards Proclus' solution. A Form like Justice Itself in Intellect is an intelligible whole or universal (*kathalou* = *kata holon*) devoid of parts. Intellect is made manifest away from these wholes in the sense that there are just people and just actions here. Plato's metaphysics provides for a distinction between Just Itself and the share of the Just in Socrates (cf. *Phd.* 102b, *Parm.* 130b). Proclus tries to solve the problem of explaining participation in Forms by inserting one or more intermediates between the utterly transcendent Form, which is said to be unparticipated, and the object that exhibits justice (*ET* 23; *in Parm.* 1069). In the *Timaeus* commentary, this doctrine is applied to Intellect at II. 403.31 f. to produce a 'twofold' Intellect – one participated and one unparticipated. There is also a twofold life since Neoplatonism connects Life, as well as Being, with the hypostasis of Intellect.

[10] Deleting ὅτι καὶ ἀγένητίς ἐστι with Kroll.

[11] Reading λέγει δὲ καὶ τὴν τοῦτον ὑποδεχομένην φύσιν αὐτὴν τὴν τῆς ψυχῆς ἐκφαίνων φύσιν, αὐτὸς γὰρ ὁ δημιουργίς ἐντίθησιν where Diehl prints λέγει δὲ καὶ τὴν τοῦτον ὑποδεχομένην φύσιν αὐτὴν τὴν τῆς ψυχῆς ἔκφανσιν αὐτὸς ὁ δημιουργός, <ὃς> ἐντίθησιν.

[12] *sômatourgein* is an odd word and Proclus likes it. The bulk of the occurrences in the *TLG* index are in Proclus, though we find one use in Porphyry's *On the cave of the nymphs* 14.3 and one in the *Corpus Hermeticum*.

these matters, he does not descend to the level of particulars, but remains
3 at the level of elements considered in their entirety.[13] For the wholesale creation (*holê dêmiourgia*) of the wholes is one that involves whole parts, but [the creation of] individuals (*atoma*) and genuine particulars he gives to the young gods (42d6) in order that when they imitate the providential
5 care that the Father exercises over the wholes, they may thereby exhibit a similar creative activity in relation to particulars and stand in a relation to them which is analogous to the one that the Father has in relation to the intelligible (*noêtos*) paradigm. For the Father – who counts as intellectual (*noeros*) in relation to the paradigm and has the status (*taxis*) of intellect in relation to the intelligible intellect – himself becomes intelligible in relation to the encosmic gods.[14]

Therefore, as we were saying, the creation is threefold: first, the cre-
10 ation in respect of wholeness. Second is the creation in virtue of the division into wholes. Third is the creation that divides these wholes into parts. It is the intermediate creation that Plato proposes to recount to us now. Such a transition follows on both from the facts themselves and from what has been said beforehand, and makes it timely for us to
15 proceed to this topic. For after he defined the cosmos as 'one visible living thing' 'having within itself all the kindred natures' (34d4), he has shown that the cosmos is single due to the uniqueness (*monôsis*) of its paradigm (31a). The division of the universe into wholes will make it clear to us that it is visible and that it encompasses all the things that
20 are akin to it. For if we were to discover the cause on account of which the cosmos is visible, and see how all the elements have been arranged within it and through what proportion, we would then easily realize that it includes everything akin to it and that there is nothing perceptible which has not been taken within the single compass of the cosmos. And
25 if we see all this, we will surely have adequately grasped what needs to be investigated. For the matter to be investigated is this: how the cosmos is visible and how it includes all of the things that are naturally akin to it – for we already know that it is unique from what has been said earlier,

[13] Lit. 'remains in the whole elements', ἐν τοῖς ὅλοις μένει στοιχείοις.

[14] Proclus here refers to the three major divisions within that level of reality that Plotinus would simply have characterized as *nous*: we have (i) the intelligibles, (ii) those that are both intelligible and intellectual, and (iii) those that are intellectual. An exhaustive inventory of the structured layer of reality in late Neoplatonism is provided in Gersh (1978). The argument here shows that these are relational notions. Though the Demiurge is an *intellectual* being in relation to the intelligibles or the paradigm, he is an *intelligible* in relation to the encosmic gods. This parallels the strategy noted above about the generated character of the soul: it is ungenerated in relation to the body, but generated in relation to intellect.

and from these things [we will know] that it is also complete or perfect (*pantelês*).

That which comes to be must be corporeal and so visible and tangible. But nothing could ever 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. (31b5–9) 30 **4**

A short time earlier when giving the definition of what is generated Plato called it 'what is coming to be and passing away' (28a3) and defined it by means of the following description: 'that which is the object of opinion together with perception' (28a2–3). But then when he showed that the cosmos is generated (28b7–c1), he converted (*antistrephein*) the definition. For he says that perceptible things have been revealed as things that are coming to be and generated. But in the present lemma he puts the term 'what is coming to be' in the subject position and predicates 'the visible and the tangible' of it.[15] For these are the extreme terms (*akra*) among the perceptibles, just as sight and touch are the extreme terms among the senses.[16] So at that point in the dialogue where he showed that the world was generated, he converted the definition, as I said, but

[15] In 28b7-c1, Plato argued that the cosmos has come to be. The argument is (i) it is visible and tangible. Therefore (ii) it has a body. So, (iii) it is grasped by perception and opinion. But (iv) what is grasped by perception and opinion has come to be. So it has come to be. Premise (iv) depends on the correlation that is stated, but not argued for, in 27d6–28a4 between 'that which always comes to be, never having being' and 'that which is the object of opinion, being grasped by unreasoning sense perception'. In this passage he argues from the premise that whatever comes to be must be corporeal to the conclusion that it is therefore visible and tangible.

[16] Proclus likens these senses and their objects to the extreme terms in a proportion which will be bound together by the middle terms. Festugière refers to Aristotle's claim that any creature with sensitive soul must possess at least the faculty of touch (*DA* 434b11 ff.). A more likely explanation follows at II.6.10–11: these senses are furthest apart because sight has a medium but touch does not. But of course this wouldn't be sufficient to distinguish touch from any of the other senses that involve a medium. Why shouldn't touch and hearing be the extreme terms? Another possible explanation comes from the Peripatetic commentary tradition on Aristotle's *De Anima*. Themistius contrasts the senses of touch and sight. He believes that the former physically takes on the form of the sensible object – it has an intermediate quality like a certain temperature and senses the extremes through taking on a different temperature. By contrast sight does not have any of the qualities it detects (Themistius, *in DA* 76.32–77.22, cf. Alexander *DA* 62.1–13). In Philoponus [?], *in DA* 413.9–12 we find the claim that smell is more corporeal than hearing since it takes longer for us to smell something closer to us than it does to hear something that occurs further away. For similar reasons, hearing is more physical (*pakhymeresteron*) than sight (413.4–12). Even Aristotle privileges fire with respect to the contrast between what is more formal and what is more material. Fire is the element that is most especially form since it tends toward the limits (*GC* 335a18–20).

here he has given the natural definition. For 'that which comes to be' is ranked as the definiendum, but 'apprehended by opinion with sensation' is taken as the definiens, just as he stated in the basic principles (*hypothesis*) (28a).[17] Therefore it is necessary, he says, that what is generated should be sensible – not in all cases of course, but in the case of this thing which he earlier called generated; that is, the composite and that which always comes to be through all time.[18] For the soul is generated too, but the argument (*logos*) is not about the soul.[19]

But suppose someone were to say that both the enmattered forms and the qualities themselves were grasped by sense and nonetheless have generation, even though they are incorporeal. Well, let this objector know that the divine Iamblichus says that these also contribute to the subsistence (*hypostasis*) of bodies and are considered together with them.[20]

Be that as it may (*d' oun*), since the cosmos contains in itself (1) a certain corporeal part and also (2) an incorporeal one, and moreover since the latter is twofold, the one part (2a) inseparable from body and the other (2b) separable, and the separable again is twofold, the one psychic (2b.i), the other intellectual (2b.ii) – and the cosmos has something is ungenerated in it, and also something generated, since in every case where something is compounded from a generated part and an ungenerated part, the whole is generated, Plato quite plausibly called the totality of the cosmos both generated and corporeal. For it has a

[17] Proclus defends the adequacy of what he sees as Platonic definitions of 'that which comes to be' and 'that which is' in terms of the capacities (sensation/opinion and intellect) at I. 243.31–243.25.

[18] Cf. I. 254.1; 366.22 where the everlasting or perpetual existence (*aïdion*) of that which comes to be is distinguished from the eternal (*aiônion*) nature of intelligible objects and the divine creation.

[19] The exclusion of soul from the class of things that are generated in the relevant sense of the word is noted at I. 233.11–16 and explained succinctly at 235.21–6: 'The heavens come to be always (*ginetai aei*) because they do not have being from themselves, but the soul is always, for it does have being from itself and all the things prior to soul do not become from a cause but are from a cause. For genesis belongs only to things that have their existence in something else.'

[20] Iamblichus *in Tim.* fr. 47 (Dillon). Proclus has just pointed out that not everything that is generated is sensible. Soul is an example of something generated (in a sense), but not sensible. What differentiates it from the other cases is that it is not a composite that is generated through the whole of time. But then what do we say about immanent forms? They are incorporeal like the soul, but nonetheless generated in the relevant sense – unlike the soul – and also apprehended by sensation. Dillon (1973), 320 supposes that Iamblichus' resolution of the aporia rests on his use of the Aristotelian term *syntheôretai*: immanent forms and qualities are not seen in themselves but only in conjunction with the objects that they qualify.

body and through this it counts as corporeal, and it has something that is generated in it and through this the whole thing counts as something that comes to be. If ever something is combined from the mortal and immortal, the resulting whole is mortal. And if ever something is combined from the generated and the ungenerated, the whole thing is generated. And if it is combined from the corporeal and the incorporeal, the whole is corporeal. If the incorporeal part were itself affected along with the body, it too would become corporeal – not just the whole alone. But if [the incorporeal part] were transcendent and impassive, it would be itself properly incorporeal and remain aloof from the body. But while the whole is not a *body* because of its connection with body (for the superior element resides in its own purity), it would most justly be called *corporeal*.

Since the cosmos has participated in 'many and blessed things from its creator, but has also come into association with body'(*Pol.* 269d),[21] it is plausibly called 'corporeal' when considered as a whole, and is both visible and tangible. For it is generated and what is generated is both visible and tangible and has a body, just as it was earlier quite correctly said to be (28b).

Beginning with the body of the world, [Plato relates how the Demiurge grants the cosmos certain gifts]:

1. He first makes it perceptible with respect to the extreme terms of sense perception [viz. sight and touch] (31b).
2. Next – what is more perfect than this – he grants to it a bond which binds together the bodies in it through proportion (31c).
3. Then third, he makes it a whole constituted of the whole of the elements (32c).
4. Then fourth, he makes it a sphere in order that it should be most similar to itself in respect of form (33b).
5. Then fifth, he declares that all things that it undergoes it undergoes by itself (33c–d).
6. Then sixth, he provides it with a motion fitting to intellect (34a).
7. Then seventh, he animates it by means of divine soul (34b).
8. Then eighth, he imparts to it revolution in time (36e–37a).

[21] This passage is a frequent focus of attention for the Neoplatonists. Plato there relates the story that the cosmos revolves in one direction under the influence of the divine. But at other periods it is left to its own devices. It cannot have an eternal motion in and of itself. Nonetheless because it pivots on a very tiny point, it can wind backwards for many ages when the divine mover is not acting upon it.

9. Then ninth, he establishes the sanctuaries of the gods in it who together produce the 'the perfect year' (39d5).[22]
10. Then tenth, he makes it all-complete (*pantelês*) by producing all the living things in the likeness of the four Forms [included within the Paradigm] (39e–40b).

Through the decad he thus completes the entire creation.[23]

I. The first gift of the Demiurge: the cosmos is perceptible

A. Why Plato mentions only being visible and tangible

6 The whole account will unfold these things as it proceeds. Right now let us just say that since the cosmos is extended and grasped by sense perception, it is known through both sight and touch, being visible in as much as it is through and through suffused with light, while being tangible in as much as it is solid. For it is sufficient for Plato to embrace all the objects of sense (*aisthêta*) just by mentioning these two senses. For when viewed in relation to the four elements that always exist in the cosmos, these things – the visible and the tangible – are opposites. This is because they are furthest apart and under the same genus. Both of them are kinds of things that are sensed and this is their common genus, but they are also very far apart, presuming that the one is a sense object that involves no medium while the other does.[24]

But if we were to investigate the contraries among the elements in as much as they are subject to change, we would not say that the contraries are fire and earth, but we would rather say fire and water are contraries.[25]

[22] Proclus means the visible heavenly bodies by means of which we would become aware of the measures of time.

[23] The decad or the number ten, of course, has tremendous significance for the Pythagorean tradition. It is a 'perfect number' by virtue of being the sum of the tetrad (i.e. 1 + 2 + 3 + 4 = 10). These four numbers are also implicated in the harmonies that will be established in the World Soul: the octave (2:1); the fifth (3:2) and the fourth (4:3). Iamblichus [?] tells us that the Pythagoreans called the decad 'the universe' (*to pan*) and 'the cosmos', *Theol. Arith*. 80.1–16 (de Falco).

[24] Aristotle insists that the flesh plays the role of the medium for the faculty of touch (*DA* 423b17–26). Alexander raises several puzzles about this (*DA* 57.1 ff.) to which Themistius responds (*Epitome* 76.16 ff.). It is hard to say how this is resolved in the Neoplatonic tradition. On the one hand Philoponus [?] thinks that the same thing need not hold for all senses (*in DA* 416.34), but on the other he seems to grant Aristotle's point that the medium of touch escapes our notice because the objects we touch are so much closer to us than what we see and hear (*in DA* 431.1–29).

[25] Cf. Aristotle, *GC* 335a5–6: earth is the contrary of air and water is the contrary of fire 'in as much it is possible for one substance to be contrary to another.' 331a1–7 explains this

For water in particular quenches fire. And each of these accounts is true. For it is common to both accounts to establish the contrariety in the extremes and in this respect the choices [about contraries] are in agreement: *qua* sensibles, earth is contrary to fire, but *qua* things that undergo change, water is contrary to fire. That is why Plato has set out the visible as something contrary to the tangible, taking the elements *qua* sensibles and not yet considering them *qua* things that undergo change, for in this way water *is* more opposed to fire than earth. And so the account is not incomplete as Theophrastus thinks.[26] He raises the following puzzle: 'why ever did Plato say that visibility was the defining feature (*idion*) of fire and tangibility [the defining feature] of earth, yet say nothing of the remaining elements?' In response to him we say that we actually see the cosmos and touch it, but we don't in any way taste it or hear it or smell it. In addition, the actual cosmos itself is visible and tangible *to itself*.[27] In as much as it is of a luminous kind (*phôtoeidês*), it is visible, and it sees itself because of the divine light which has been stretched through the entire heaven like a rainbow, as Socrates says in the *Republic* (616b5).[28] For that divine light is able to see in the primary sense

contrariety in terms of their composition out of the four basic contraries which, in turn, underwrites the capacity of water to quench fire (331a16 ff.). Aristotle also supposes that fire and earth are 'extremes' (*akra*) while air and water are intermediates (*mesa*) because both the former tend to the limits (330b34–331a2). His distinction between contraries and extremes seems to make a similar point to the one that Proclus makes by distinguishing between contraries in respect of change and contraries in respect of being sense objects.

[26] Diels, *Dox. Gr.* 493.

[27] In response to Plato's claim (33c1–4) that the cosmos lacks sense organs, Proclus considers whether it nonetheless has perception since it is alive (II. 81.16 – 83.2). He concludes that it does, but not in the same way in which we sense things through separate sense modalities. The cosmos' self-perception is like the relation of intellect to intelligibles in as much as there is an identity of perceiving subject and object of perception. ('For according to the whole itself it is both visible and an eye, since we say that the sun is an eye and each of the stars. So the entire cosmos is sight and visible' II. 84.6–8). It follows from the nature of this perception that the sense modalities are not divided from one another in it (II. 85.10–13). See also *in Remp.* II. 154.23–155.12.

[28] It seems likely that Proclus here adverts to his view about the space that the cosmos inhabits. Cf. Proclus ap. Simplic. *in Phys.* 612.24–613.1. Note that this passage too refers to *Republic* 6161b as a *confirmatio*. According to Proclus' view of space, it is an immaterial body of the nature of light. This immaterial body provides the 'vehicle' of the World Soul. Hence one might say that this divine light brings life to the things that it illuminates. On Proclus' theory of space as light and the place of the heavens, see Siorvanes (1996), 247–56; Schrenk (1989); Schrenk (1994); Sorabji (1988), 116–24. For Proclus' views on the vehicle of the soul or 'astral body' see *ET* 196, 205, 207–10 and *in Tim.* III. 236.31 ff.; 297.16 ff., as well as Dodds (1963), Appendix II. Finamore (1985) considers the doctrine of the soul's vehicle in Iamblichus.

7 (*to prôtôs horatikon*),[29] extending through the whole of the cosmos. As the sphere of the sun is the vision of the soul within it, so too this divine light is the vision of the universal soul; pervading and acting upon the things 5 that are seen, it gives life to them.[30] It is *this* that you would call the visual organ in the strict and primary sense rather than that organ whose subsistence is accompanied by a passive affection, and which is separate from the object of vision. And further still, in as much as [the cosmos] is solid and filled with life, it has what is called consciousness (*sunaisthêsis*) 10 (for even we have consciousness of the motions and affections brought about in us) and through this consciousness it gets in touch with itself.[31]

However, the most proper resolution of the puzzle we are considering is the one that says that Plato's account assumes extremes [i.e. fire and earth] prior to the other [elements] since the latter ones are established for the sake of the former, and the account will go on to explain that the remaining ones are established as a bond between these extreme terms 15 (32b5). Or one might even say that through [mentioning] the extremes he has included the intermediate elements, for just as the universe is bounded through fire and earth and includes the intermediate elements within these, so in the same way the account has collected together the various kinds of sense objects through the visible and the tangible.

B. Fire is what is primarily visible

He uses this proposition [viz. that what is generated is visible and tangible] as a fundamental principle (*axiôma*), for it is customary for 20 him to assume, prior to each question, a fundamental principle from which he demonstrates the thing that is sought, as for example 'one who is good is never jealous about anything in any way' (29e1), which he assumes in order to demonstrate that the Demiurge makes all things good (*agathunein*). Or, to take another example, 'it is not, was not, nor

[29] Cf. Arist. *Metaph.* 1049b15 for a similar use of *to horatikon* in the phrase 'that which is potentially able to see'.

[30] Cf. *in Tim.* II. 84.8 where the sun and other heavenly bodies are eyes. Perhaps the thought is suggested to him by *Rep.* 509a ff. For Proclus' reading of the image of the Sun, see *Plat. Theol.* II. 43–51.

[31] 7.10–11: καὶ διὰ τῆς συναισθήσεως ταύτης αὐτὸς ἑαυτῷ γιγνόμενος ἁπτός. We have no main verb here and so must presumably understand ἐστι ἅπτος in some sense. Then αὐτὸς ἑαυτῷ γιγνόμενος looks very puzzling. Harold Tarrant suggested to me an emendation to γιγν<ωσκ>όμενος so that we have something like 'through this consciousness, touch itself is known by itself'. My 'Haight-Ashbury Proclus' is an attempt to keep the text that we've got, though I have no great confidence in it.

ever will be lawful for that which is the best to do anything other than what is most fine' (30a6), which he assumes in order to show that the cosmos is a 'living thing, ensouled and possessed of intellect'. Or to take one more example, 'nothing assimilated to an imperfect model can ever become beautiful' (30c6), which he lays down in order to consider what sort of paradigm it is in relation to which the Demiurge established the cosmos. Therefore in the same fashion he assumes in this context as a fundamental principle that it is necessary for what is generated to be visible and tangible. From this he demonstrates, first, how the elements contribute to the composition of the cosmos and, second, how they have been arranged in the universe. For if it is necessary for the cosmos to be visible and tangible, then it needs fire and earth. After all, that which is primarily visible (*to prôtôs horaton*) is fire. First, because the visible **8** things themselves are lights, for all the colours are products of light.[32] Next, because sight itself is light proceeding from an aetherial substance (*ousia aitherôdês*).[33] Third, because sight and the visible require light to bring them together if each of them is to exist in actuality, as is said and demonstrated in *Republic* (507d–e). What is responsible for bringing these things together? It is light. As a result, if the cosmos is to be visible, it is requisite that fire enter into its generation. And further to this we may note that Pythagoras shows that the eye is analogous to fire in his *Treatise to Abaris*.[34] For it is the most elevated of the sense organs, as fire is the most elevated of the elements; and moreover it makes use of piercing activities, as does fire. Finally there is no small similarity between the conic form [of the visual ray that comes from the eye] and the pyramidal form of fire.[35]

[32] πρῶτον μέν, ὅτι καὶ αὐτὰ τὰ ὁρατὰ φῶτά ἐστι· πάντα γὰρ τὰ χρώματα ἔγγονά ἐστι φωτός. Aristotle makes light the activity of the transparent by means of which colours are seen (*DA* 418b1 ff.). All colour is seen in light, though there are other visible things like phosphoresence that are seen without light (419a8). Plotinus and Proclus both resist this 'passive' view of light and make it an active principle. Most importantly for this passage, at one point Plotinus appears to say that colours are lights or illuminations (*phôta*), II.4.5, 11.

[33] Proclus perhaps refers to *Timaeus* 45b4–d3. The fire that comes out of the eye is akin to the light of day. Though Plato does not call the eyeball an aetherial substance, he does say that it is smooth (*leios*) and dense (*pyknos*).

[34] Iamblichus *VPyth.* 19 says that Pythagoras instructed Abaris the Hyperborean in matters of physiology and theology. If there was such a treatise, it would doubtless have represented itself as the content of that instruction. Cf. Thesleff (1961), 19.

[35] The fire particles of the *Timaeus* are, of course, pyramids (52d5). As for Proclus' claim that it is the most elevated of the elements, Plato does call it the *prôton eidos*. (For Aristotle on fire's special status, cf. *GC* 335a18–20 and n. 16 above.) While Plato does not explicitly say that the ray that proceeds from the eye in vision is conical, this seems a reasonable inference. For the cone of vision, Diehl refers us to [Aristotle], *Prob.* 911b5.

Plato did *not* say, however, that *only* fire is visible. This statement is doubly false. First, when fire in and of itself exists unmixed with other elements, it is in no way visible but is merely conceived of (*epinoein*) as something visible. Second, none of the other elements will be visible if only fire is visible. After all, it would be one thing to say that they are visible *on account of* fire and *together with* fire, but something else again to say that only fire itself is visible. Hence he did not say the latter since it can be refuted in these two ways, but rather says the former – that nothing is visible separate from fire, from which one might infer that all bodies participate in fire, but different bodies have different sorts of fire (II. 66.19–28). For light and flame are not the same thing, nor is flame the same thing as burning coal,[36] but from higher up there is a deterioration (*hyphesis*) of fire down as far as Earth. It proceeds from a more immaterial, purer and less corporeal condition until it gets to the most fully enmattered and densely packed bodies. For there are even streams of fire under the Earth, as Empedocles says at one point:

> beneath the surface [of the earth] burn many fires.
>
> (DK B52)

9 Therefore we should not be amazed at how it happens that the fire is not quenched even when it is in liquid form. For all the elements permeate (*xôrein*) one another, though what predominates in one thing is different from what predominates in another. And besides, light too is a kind of fire penetrating everything. Now, Numenius *supposes* that all things have been mixed, and so thinks nothing is simple (fr. 50 des Places). But Plato *knew* the mixture of these things and also relates the nature of each of them individually, moulding the elements out of figures.[37]

But perhaps the marvellous Aristotle will contest our account by positing that not all visible things are so through participation in fire, for the chorus of stars and the mighty sun itself are not [in his view] things composed of fire even though they are visible.[38] But one might respond to him by saying that enmattered fire is one thing but immaterial fire

[36] Cf. Arist. *Top.* 134b29: these are all species of fire. See also Alexander *in Sens.* 22.8–19.

[37] The epistemic situation of Numenius is contrasted with the certainty of the divine Plato by means of the distinction between the verb: *oietai* versus *oiden*. It seems unlikely that Numenius himself took any pains to qualify his claims to know. Certainly Proclus' report earlier on the three gods (*in Tim.* I. 303.27–304.4 = fr. 21 des Places) sounds dogmatic enough. Moreover, Numenius' own remarks on the sceptical Academy suggest that he would not have sought to express his own views in terms that indicated that such matters were beyond our understanding. Perhaps Proclus is simply catching at words here.

[38] Diehl refers to *Mete.* 341a3 ff., while Festugière draws our attention to 339b30–340a3. Proclus rejects Aristotle's view that the heavens are composed of the fifth element, aether. Instead he supposes that the celestial spheres are composed of a mixture of all four of the elements – albeit the 'summits' or purest forms of these elements (II. 49.2

is another – that is, it is immaterial because *compared* to the matter of the things in the sublunary sphere it is immaterial – and the one kind is destructible while the other is indestructible (II. 10.3). While one kind is mixed with air, the other is pure. And generally speaking, because fire has many forms, perhaps Aristotle will concede to this account[39] and listen to the theologians (*Or. Chald.* 60) who call the sun 'fire, channel of fire' and 'dispenser of fire' and all other such names. For to what else can he assign the visible? To something other than what is able to engender light? And what else is of such a kind other than fire?[40] For earth is that which produces the complete opposite, since it is the cause of darkness and the more earthly partakes less of light. But air and water are transparent and not intrinsically visible things. Hence each of these [air and water] is a middle term between that which is primarily visible and that which stands in the way of [or occludes] visible things. And they may be a cause of other things being seen [when they function as the medium], but they are not causes themselves in as much as each is transparent. Nevertheless, other things are seen *through* them. So the only remaining option is that it is fire that illuminates and makes the object visible by its presence.

And if someone were to say that the heavenly element is not fire, though it is visible and capable of illuminating, we shall ask him from whence does the fire down here (*entautha*) derive this capacity?[41] For if each is such as to engender the light that enables perception, what reason

ff.; cf. *Timaeus* 31b4; 40a2; 58c). In the Neoplatonic tradition subsequent to Proclus, Philoponus is the most outspoken critic of the Aristotelian notion of aether, though his reasons for this are bound up with his Christianity. See frs. 56–61 of *Against Aristotle on the Eternity of the World* = Simplic. *in Cael.* 84 ff. In the *contra Proclum* 520.8–20, Philoponus deploys the very objection that Proclus considers here, but Philoponus attributes it to Theophrastus: 'The Demiurge began the composite of the cosmos from fire and earth. But it is necessary that what has been generated as corporeal in kind be resistant and visible. Theophrastus says that if the tangible and visible result from earth and fire, the stars and heavens will be composed of these. But this is not so. He says these things in introducing the fifth element that moves in a circle' (= Diels, *Dox. Gr.* 493).

39 Proclus calls the mixture of the four elements in the heavens a fifth *essence* (*ousia*), though it is not an *element* (II. 40.26).

40 For Aristotle's account of why the sun and stars give off light and heat, see *Cael.* 2.7 and *Mete.* 341a12–36. He claims that their heat in particular is brought about by the fact that their movement ignites the air that lies in a band beneath the innermost celestial sphere (that is, the upper atmosphere of Earth). For a defence of Aristotle's view, see Alexander *in Mete.* 18.8–19.19; Simplic. *in Cael.* 435.12 ff.

41 Philoponus also argues from the similarity of the powers of celestial and terrestrial bodies to the conclusion that they are composed from the same elements. 'For there is perhaps no [quality] observed in the things there that does not also belong to the terrestrial bodies' fr. 59, (Wildberg, 1987).

could there be not to call each fire, though one be immaterial and the other enmattered? (I mean 'immaterial' or 'enmattered', as I said before (8.24), distinguishing that kind [of matter] that stays forever in the same condition and in its own proper form from the kind that is densest and does not retain the forms.) Since, as we shall learn, matter pervades the whole cosmos, just as the gods say (*Or. Chald.* 34); for this reason Plato goes on to call matter the receptacle of the universe in what follows.[42] Such, then, are the kinds of light that correspond to the sorts of fire, and the analogy shows that even the light from up there (*ekeithen*) is a result of fire.

It must also be said that Plato does not characterize fire by either heat or its tendency to move upwards (because this is a distinctive feature of fire *here* when it is not in its appropriate place), but he rather distinguishes fire by reference to visiblity. This feature belongs jointly to all fire, whether it be the divine kind or the perishable or the kind that burns or that which strengthens.[43]

C. Earth is what is primarily tangible

On another point, the same terms must be applied to earth because it is that which is primarily solid. Please don't anyone tell me that earth has come to be solid from something external to itself.[44] No – within

[42] Aristotle's term for matter (*hulê*) appears once in Plato's *Timaeus* (69a6), but not in the sense in which Aristotle uses the word. However, it is clear that Proclus is following the well-worn path marked out by Aristotle in identifying matter with the receptacle (*to metalêptikon*, *Phys.* 4.1, 209b11–12). Modern friends of Plato have questioned this identification. See, for example, Cherniss (1944), 121–2. However ancient Platonists seem to have been less hesitant to accept it. The identification goes back to at least Antiochus of Ascalon (cf. Cicero, *Acad.* 2. 27 ff. and Dillon (1996), 82). Proclus could have found authority for it both in sources that he trusts (e.g. Timaeus Locrus 205.9 (Thesleff)) and those whom he regularly criticizes (e.g. Plutarch, *De An. Proc.* 1024c; cf. Cherniss (1976)). Reydams-Schils (1999) argues that the assimilation of the receptacle to matter is motivated in large part by the tendency among middle Platonists to read the *Timaeus* through the filter of Stoicism. One way to understand the two principles of Stoic physics – god and matter – is in terms of the *Timaeus*. God in the Stoic scheme collapses into one principle three distinct principles from Plato's work: the paradigm, the Demiurge and the World Soul, cf. Moreau (1965), 160 ff.

[43] Perhaps a reference to the action of daylight in coalescing the fire that comes from within the eye, *Timaeus* 45c3.

[44] Festugière conjectures that this potential objection may not be one assigned to a purely hypothetical critic. He supposes that it might be part of the Parmenidean theory of the two forms (fr. 8, 53–9) of Light and Night. I think that if Proclus or his teacher have anyone in mind at all, it might be someone like Anaximenes who supposes that earth derives its solidity from the condensation of the air (Theophrastus, ap. Simplic. *in Phys.* 24.26) or something else 'external to it'.

the class of sensible things, that which is most solid possesses this defining property prior to those that are less so. After all, it is also the case that that which is most especially hot [has the corresponding] distinctive property ahead of things that are less hot. And it is from this [i.e. the elemental heat] that things that are less hot *acquire* their share of this property. Therefore, in just the same way, that which is especially solid imparts its own solidity to that which is less solid. If earth is the most solid of the elements, and if what is most solid is the cause of solidity among the less solid things with which it is mixed and it is not the case that the things that are less so are the cause of being such and such to the things that especially or outstandingly have this property[45] – if all this is so, then it is surely necessary that earth is the cause of solidity among the other elements, thereby being opposed to fire. And if we were to assume what is apparent to us (*ta phainomena*) through perception – assuming that the heavens are fiery and that the earth upon which we walk is a particularly clear example of earth – the opposition between these two will be obvious. The one is always in motion while the other is motionless. Moreover the former is pre-eminently visible while the other is pre-eminently tangible. Finally the heavens are maximally rarified through light, but the earth is maximally dense on account of darkness.[46] But if we wish to consider the initial (*prôta*) elements of things here – that is, fire itself *qua* fire or earth *qua* earth – in a short while we will provide all their oppositions when we also examine the proportions of the four elements. Be that as it may, let us assume from this that it is manifestly true that the visible is the defining property of fire and the tangible is the distinguishing property of earth.

11

On account of this, Porphyry reports the following division among the kinds of daemons.[47] The visible ones have an excess of fieriness in their

[45] Cf. *ET* 97. In a causal series, the original cause has the distinctive property *prôtôs*. It communicates this property to its effects which have it only *kath' hyphesin* and through reversion.

[46] Proclus here enumerates two of the three powers that are distinctive of these elements on his own account of them, *in Tim*. II. 39.19 ff.

[47] In the Platonic tradition daemons are the semi-divine intermediaries between gods and men (cf. *Symp.* 202e). The *Epinomis* – perhaps the work of Philip of Opus who edited the *Laws* after Plato's death – gives *Timaeus* 40a an odd twist. In the *Epinomis* we find a fourfold division of created creatures in the world which mimics the four kinds within the Intelligible Living Being. The divisions seem to be based on the *dwelling place* of each kind of creature: gods in the heavens, birds in the air, fish in water and terrestrial creatures. The *Epinomis* adds aether to the four elements and makes a division of the kinds of living creature based upon what *ingredient* predominates in the mixture of elements within them. There are daemons intermediate between the gods and mortal creatures composed mostly of earth. Some are composed of air and others mostly of aether. Demigods are the genus composed mostly from water (*Epinomis* 984d-985d).

composition and [as a result] also have nothing of a resistant nature, while the ones that have participated in earth fall under the [faculty of] touch. But these divisions were refuted, he adds, by the nature of the daemons who appear to the Italians around Tuscany. For they are distinctive not only on account of emitting sperm and generating worms from the sperm, but also by burning and leaving behind ashes. From these things, surely, and from Porphyry it is shown that all things participate in earth. But [even though everything participates in earth] the nature of earth is not the same everywhere in all the parts of the cosmos, but at some places it is purer, less material and without heaviness (for heaviness is not the defining property of earth, but rather tangibility is). In other places it is more enmattered and heavy and difficult to move. In some places it exhibits only solidity, while in others it takes on powers that result from the fact that these are works of genesis (*genesiourgos*) and enmattered – just as in the case of fire.

Suppose Aristotle had heard what we have said and urged the following puzzle: how is it that if there is fire in the heavens they are moved in a circle and not in a straight line?[48] We would have to respond to him by invoking Plotinus' argument that every simple body, when it is in its proper place, either remains motionless or is moved in a circle, lest it depart from its proper place. For if it is moved in another fashion, either it will no longer be in its own place or else it is not yet in its proper place.[49] Since the heavenly realm is fiery of necessity, then, if

We find subsequent Platonists working out theories of daemons: Xenocrates, Albinus, Plutarch, Porphyry, Iamblichus.

Proclus gives a short account of daemons in *in Alc.* 67.17 ff. It is also possible that he intended a seventh book of the *Platonic Theology* to survey the orders of encosmic gods, including daemons. The question is taken up in pp. xxxv–xliv of the introduction to volume VI. Thomas Taylor believed in such a book and appended an essay to his translation of *Platonic Theology* in which he assembles passages from Proclus' other works and weaves them together with his own remarks. Further references to daemons in Proclus are provided in C. Zintzen, s.v. *Geister* (*Dämonen*), §c, Hellenistische und kaiserzeitliche Philosophie, cols. 640–68 in vol. ix, Klauser, Dolger and Lietzmann (1950). For the short course on daemons in Middle Platonism, see Dillon (1996), 46–7. For a fuller treatment, see Brenk (1986).

48 *Cael.* 1.2, 269b33–5. Aristotle argues that the element that makes up the heavens cannot be either light or heavy since it doesn't move toward or away from the centre. It cannot move in a straight line because (a) each element has but one natural motion and (b) rectilinear motion is peculiar to the four elements that he thinks he has already excluded from being the elements of the heavens in the previous chapter.

49 Proclus omits, for the moment at least, one important aspect of Plotinus' discussion (II. 2.1, 23–4). Fire is naturally such as to be in motion. Thus it cannot just stop when it gets to its natural place but must keep moving and can only stay in its natural place by moving in a circle. Proclus adds this crucial premise a few lines later at 12.13–14. I believe that Proclus does add something important to Plotinus' progress on this subject.

it moves, it moves in a circle. For even in the case of the earth, if it were moved, then it would be moved in a circle, lest it abandon its place in the middle. For whenever fire is carried upward it is carried upward because it was in an alien place; and the clod of earth is carried downward for the same reason. Overall, the movement of the elements in a straight line results from their being in a position that is *contrary* to their natures. So it is simply a mistake to say that when fire moves in a straight line it is moved *in accordance with* nature.[50] For it is particularly in accordance with nature when it occupies its proper place. But whenever it is carried to its proper place, it is so because its previous location was contrary to its nature. When this is demonstrated it is then obvious that the heavenly fire, since it *is* moved, is moved in a circle – and so there is no problem for Plato's account on this point. For if fire were not moved in a circle, it would not yet be in its natural place. But if it is in its natural place, **12**

Proclus' account of the three defining powers of the elements provides an explanation for why fire is always in motion while the other elements are not. Plotinus has no explanation for this.

[50] Aristotle insists that the rectilinear motions are the natural motions of the four simple bodies (*Phys*. 4.8, 214a14; *Cael*. 1.2, 269a27), so it appears that here Proclus flatly contradicts him. However, the question of the extent to which Proclus really disagrees with Aristotle is complicated. On the one hand, Aristotle accepts that natural place can also be a cause of rest. Thus, earth is naturally at rest when it is in the middle. Aristotle infers that the rectilinear motion exhibited by the earth when it falls is also natural. Why? Well, it must be either natural or forced. When an object is moved to a place by force, it must remain there by force. Since the earth in the centre requires no force to remain there, its movement to the centre is natural (*Cael*. 3.2, 300a28; cf. 2.13, 269a20). If Proclus seriously wants to say that the motion of earth toward the centre is contrary to nature because it takes place only in virtue of the fact that the earth is not in its natural place to begin with, then it appears that the only "natural motion" of earth, air and water will be either (perversely) rest or else rotation in each one's natural place. The hypothetical character of the previous considerations about the earth's circular movement (εἴπερ ἐκινεῖτο, κύκλῳ ἂν ἐκινήθη 12.1–2) suggests that he would not want to accept the second alternative for the remaining three elements. The real disagreement between Proclus (and Plotinus too) and Aristotle is not so much about the very idea of natural rectilinear motion, but rather (a) whether fire's natural motion is rectilinear or circular and (b) whether fire is such that it ever has a natural state of rest. Proclus takes Plotinus' reply to Aristotle further by giving an account of fire according to which it is essentially in motion. In one sense, then, this is its natural motion and rectilinear motion is unnatural for it, since it exhibits this motion only when it is not in its natural place. In another sense, however, fire's motion upwards is natural for it is explained by fire's natural place. Proclus can take on board Aristotle's account of natural place. What they really disagree about is the essentially kinetic character of fire. This is fortunate, for the Neoplatonists generally accept the explanatory utility of natural place – with the exception of Philoponus (*in Phys*. 581.8–31; 632.4–634.2). Iamblichus is particularly important for establishing the causal power of the particular places of individual bodies over and above the general influence of natural place on the elements in Aristotelianism (ap. Simplic. *in Phys*. 639.23–640.12).

then it will either be motionless or else it will be moved in a circle. But it is impossible for it to be motionless, since all fire is by nature highly mobile. Therefore it can only be the case that it is moved in a circle. But let us return to the topic at hand.

D. Summary

If the universe is generated, it is necessary that it be perceptible. And if it is perceptible, it must be visible and tangible. But if this is the case, then it must be composed of fire and earth. And if it is composed of these things, it must also be composed of the intermediate elements. For earth and fire are set furthest apart from one another – to just as great a degree as touch and sight have been set apart – and if the cosmos is to be visible there must be fire, and if it is tangible there must be earth. For that which is solid is tangible insofar as it is capable of standing firmly against the sense of touch. What is easily broken up and cannot withstand being touched is in no way tangible. On account of this, Pythagoras called the earth 'stouthearted' (*tlêmôn*)[51] in as much as it is solid and pushes back against touch; and also as something that is not easily moved and which participates in the capacity to be stable. Therefore, if it is just as he said, and there must be fire in order that the cosmos may be visible, and there must be earth in order that it may be tangible, then god from the beginning must make the universe out of fire and earth. But this is not because the god actually made these things *first*, for we have long ago given up on the idea of a generation of the cosmos in time.[52] But since all the physiologists start out from opposites,[53] for this reason Plato too says
13 that the universe starts with a composition of fire and earth in order that its visibility may be realized through the fire and its tangibility through the solid [character] of earth, which he with total accuracy denominates 'a certain solid'. For physical solids are one thing, but mathematical solids are another. The latter are intangible, but the former tangible and of course it is the tangible one that the argument now requires. For the physical solid is the kind that is tangible.

Those who raise the puzzle about why earth alone counts as solid are absurd; for both water and air, they say, are like this. We may simply reply to them that resistance (*to antitypon*) especially belongs to earth. At any rate, earth is the foundation (*hypobathron*) of the others, for earth acts as a support for water and for air; in fact for both of

[51] The word *tlêmôn* occurs in the *Golden Verses*, but not in a way that suggests that it has a physical symbolism according to which it refers to earth. Nothing in the commentaries of Iamblichus or Hierocles suggests this either.

[52] Cf. *in Tim*. I. 276.30 ff. [53] Cf. Arist. *Phys*. 187a19–30.

them. Therefore earth is the first tangible thing and the first resistant thing and on account of this it is the first solid. We will dismiss those who say that he called the three elements that come after fire 'earth' in this passage. For one could not say what would remain to be the middle term between earth and fire [if these other elements counted as earth].

II. The second gift of the Demiurge: bond and proportion

It is not possible for only two things to be well combined in the absence of some third thing, for there must be some bond between the middle to effect the combination of both. The finest bond is the one which makes both itself and the things that are bound one. (31b9–c4)

A. The bond in general

In this passage, the **bond** (*desmos*) is understood as offering itself as an image of divine unification and the mutual sharing of powers in virtue of which the intellectual causes of wholes achieve their productions. On the other hand, what is fine is here understood as involving a unifying and binding essence and power. For the words **well combined** and **the finest of bonds** both appear to me to have this signification. Beginning, therefore, from the Dyad as something aligned with (*suzugos*) Generation, Procession and Difference, he introduces unification to the things that participate in the Dyad and also harmonious association through the bond – this gift being the second of the things given to the cosmos by the Demiurge.[54]

14

I beg the misinterpreters of Plato not to raise any of the following objections against his discourse:

(1) Those who say that semicircles require no kind of bond in the generation of the circle do not speak correctly. For the circle is not established from semicircles but rather the opposite is the case. For when the circle *already* exists – and not as something composed out of semicircles – then when the diameter is drawn then at that point

54 The dyad in question seems to be the two extreme terms of the four elements, fire and earth. The bond will be the relation of proportion that is introduced between them by the two middle terms, air and water. Generally speaking, the Neoplatonists appeal to some sort of dyad or pair of items in order to explain the devolution from unitary principles to plurality. The relation of such notions as 'the one' and 'the dyad' to Plato's own philosophy is a vexed one. Proclus, however, employs the metaphysical mechanism of unitary and dyadic principles at a variety of levels. Different pairs play the role of the dyad at different levels of being, cf. *in Tim*. I. 176.6 ff., II. 18.1–8. For the role of one and dyad in Iamblichus, see Dillon (1973), 29–33.

semicircles are made. The name itself proves this, since 'semicircle' has its derivation from 'circle' and not vice versa.

(2) Neither are those who take it that the monad and the dyad are somehow opposed and have no middle correct.[55] For Plato does not say simply that in the case of things of *whatever character*, there is something between them, but says instead that in the case of such things as are intended to complete the subsistence (*hupostasis*) of a single composite, [there is something else between the things joined]. Hence, he said that 'it is impossible to combine two things well *alone* separate from a third thing', and the monad and the dyad are not opposites since the dyad is made of monads.

(3) Nor again do those who cite examples of things that are destroyed together like the honey that has been mixed with wine [say anything worthwhile].[56] For these things no longer exist when the mixture comes to be. Moreover, we are not now examining things that *perish* together (for there is nothing so wonderful in that) but rather how the things that have been harmonized in relation to one another *endure*. For this bond is the cause of preservation to the things that have been bound, not of their common perishing and destruction.

(4) Those who adduce as an example the "communion" of men and women as something that does not require the bond of a third in order to sustain it are also mistaken.[57] These people have overlooked the details of their own case and do not see the greatest bond – that of love – which motivates the communion; awakening it in one manner with respect to psychic life and in another with respect to the physical.

[55] Perhaps Nicomachus of Gerasa is intended. He seems to equate the one and the dyad with sameness and otherness, and treats the latter pair as opposed (*Introduction to Arithmetic*, II.18.1, II.19.1 (ed. Hoche)). Yet he also claims that the dyad comes from the doubling of the monad (*Arith*. II.17.1; cf. [Iamblichus], *Theol. Arith*. 5.4 (de Falco)). Proclus exploits this internal tension, insisting that monad and dyad are not opposed because the dyad is made of two monads.

[56] Proclus perhaps has in mind the Stoic species of mixture called 'fusion' (σύγχυσις) in which the ingredients in the mixture cease to exist and a new third substance comes into being (Alexander *Mixt*. 216.22–5 = *SVF* II.473). Alternatively, he may be thinking of Stoic *krasis* but understanding it in terms of Diogenes Laertius' text (7.151) – a text where modern editors frequently read *sygkrathêsetai* for Diogenes' *symphtharêsetai*, Lewis (1988). Note his use of this term below.

[57] *koinoneô* can, of course, be a euphemism for 'to have sex with', cf. Plato, *Laws* 784e. It is not likely that Proclus – who seems to have abstained willingly from sexual relations (Marinus, *VProc*. 17) – found much humour in this objection. His reply alludes to the distinction drawn in *Symposium* 208e–209a between those who are pregnant in body and thus respond to *erôs* by having children as opposed to those who are pregnant in soul and bring forth much finer things.

(5) Nor is the example of the body and soul one where there is no bond. For there is a middle term between these – the bond on account of ensoulment.

(6) Neither is the example of things that are fused together like gold or silver since there is the same substrate (*ousia*) of these, for both of them are water.[58]

So you see all of these people have simply been led astray from the real thought of Plato.

To return to the point, *we* say in accordance with what was said previously that it is necessary, first, that there really be the two [constituents] in relation to the composition of the one object; next that it should not be the case that there is mutual destruction (*symphtheresthai*) in relation to the composite – for then there would again not be things that have been bound together, but no longer anything – and third that they genuinely be the elements of the thing that they compose. If these conditions are met, then it really will require some third thing in order to bring about the composition. For what will lead the [constitutent elements] to form a single thing since they are separate, divided and furthest away from one another? But if nothing happens to them, they will remain divided and persist in the same manner that they were in before. But if something does happen, besides what already has happened, this thing that happens will be the bond between them, since it would be the thing that brings them together into one composite. **15**

Now a bond is spoken of in three ways. One kind is the pre-existing (*proÿparchôn*) bond in the *cause* of the things that have come together. Another is the immanent (*enyparchôn*) bond in the things that have been bound together, which has the same rank (*homostoichos*) as them and is connate (*symphyês*) with them. The third sense of bond is intermediate between these. On the one hand, it proceeds from the cause, but on the other it is also manifested (*emphainomenos*) in the things that have been bound. Take an example. The bond of the animal and of the parts in it is, first, the one rational forming principle (*logos*) that has been pre-established (*proïdrymenos*) in the very cause of the animal. In another sense, the nerves and the muscles come to be a bond of the things in the animal. Third is the single physical rational forming principle that proceeds from the cause and uses the nerves and all the material organic

[58] Proclus here uses *ousia* in the Stoic sense of substrate or matter. For the idea that metals that melt when heated have water as their underlying matter, see Aristotle [?] *Mete.* 4.10, 389a7–12. Here Aristotle describes things as 'out of' water or earth. Alexander explicitly calls the water and earth in these metals the matter (*in Mete.* 220.27). On the authenticity of book 4 of Aristotle's *Meteorologica* and the chemical theory therein, see the introduction in Lewis (1996).

bonds for the composition of the animal. For this third thing is neither transcendent in relation to what has been composed nor is it excluded from the class of true causes, since it has the status of 'that without which'.

You must not understand the bond presently being discussed as the first kind of bond. For that bond has been shown not to differ from the cause, but the cause entirely transcends the things of which it is the cause. However, Plato says that the bond is *in between* the things that have been bound together, and what is in the middle of something is not separated from that thing.

Nor must you understand by what is said that he is here discussing the organic and completing (*teleutaion*) bond. For the bond in this respect is neither master of itself nor does it bring about the appropriate unification. But remember that Plato said 'that which makes both itself and the composite to be one'. It is possible to arrange this in the middle and for it to have this power through proportion, which is the most beautiful bond, and it is possible to give to this bond the power of making all things one and the same. Therefore this bond is inseparable from the things that it binds and the proportion is the bond. It is both different from all the things that have been bound, and at the same time immanent in them. The Demiurgic will is a transcendent bond of the things bound, since Plato has the Demiurge say to the generated gods '[you have received the guarantee] of my will – a greater and more sovereign bond than those with which you were bound when you came to be' (41b4–6). So it remains for us to understand [the bond in question] according to the middle mode and as having the middle form of bond, neither creative (*poiêtikon*) nor organic.

1. Digression: what does the bond of the world's body symbolize?

From whence do we get the conception of such a bond, and of what is it a symbol?[59] (i) Of course it comes from the one cause of whole things, for the capacity to make something one is present to all things in

[59] Consistent with the pattern of Neoplatonic causal overdetermination from above, Proclus now catalogues all the causes or sources of our conception of the bond of analogy. These include the One, of course, as well as the One-Being of the second hypothesis of the *Parmenides*; the All-perfect Living Being upon which the Demiurge models the cosmos; and finally the unspecified cause of continuity. Festugière in his note on this passage stresses the manner in which encosmic things, like the bond of proportion, are symbols of higher realities. He examines what he takes to be an analogical pattern of interpretation in which things here are paired with things up there, cf. Festugière (1971), 561–3.

respect of this – the font of all unification, through which even intellect is conjoined to the intelligible, bringing forth the light of truth which, of course, is the very first bond. [This cause] is that by which all things are conjoined and in some way contribute to a complete unity (since it has given rise to likeness); and it is that through which the Beings that have proceeded revert upon their appropriate principles. (ii) And the conception of such a bond also comes from the One-Being[60] which is the very first of beings and encompasses in a unified manner (*hênômenôs*) the causes of all things in respect of the bond in itself and the divine unification. (iii) Further, the conception of this bond also proceeds from the All-perfect Living Being, for the intelligible universe is united in itself well before the sensible world is; and prior to proportion down below, the causes of the wholes which are immanent in the intelligible pervade each other – just those causes which proportion imitates when it produces all things in everything and makes different things participate in the same qualities. (iv) And surely the conception of such a bond also proceeds from the cause of continuity, for proportion also introduces continuity to the things bound by it, which Plato says is 'indissoluble' by everything 'except the one who bound them' (41b). Therefore, in virtue **17** of proceeding from these causes, the bond is connective and the cause of communion and of the single unification of things that were separate <and opposed to one another>.[61] This bond is the conductor (*chorêgos*) of harmony, and responsible for different things working together (lit. conspiring – *sympnoia*) and tending towards one and the same unity; and it is all these things in order to resemble the causes from which this concept has been given to us. Now that these things have been so distinguished and defined, let us return to the very thing that we have proposed to consider.

B. Application to the case of bond in the cosmos

Now, since it was necessary for the cosmos to be something generated, visible and tangible, it was in need of fire and earth. Fire it needed in order to be visible. For sight is aetherial, and on account of this it gives off rays;[62] but the thing that brings both of these together [i.e. that which sees and that which is visible] is light. Now, all light comes from

[60] The One-Being or *to hen on* appears in the second hypothesis of Plato's *Parmenides*. See *Plat. Theol.* III § 24 for a summary of Proclus' views on the One-Being.

[61] Reading καὶ τῆς τῶν ἐναντίων in accordance with Diehl's suggestion rather than merely Kroll's καὶ in the lacuna.

[62] The claim that what sees is aetherial is probably connected in some way with the doctrine of the aetherial vehicle of the soul. Simplicius [?] in his *De Anima* commentary notes in passing that the aetherial vehicle is capable of perception.

fire (for it does not come from earth, which instead engenders darkness) though, just as we said earlier (8.22), fire comes in many forms. Because the cosmos is tangible, it is in need of earth, for earth is that which is particularly solid. This is so because it is more stable (*monimôtera*) and unimpressionable (*antitypôtera*) than the other elements, and what is particularly solid is particularly tangible since it resists the application of pressure more than what is not solid. Therefore earth is especially tangible. Let us therefore take it that these two elements are first among the things laid down in the universe and are opposed to one another. Fire is analogous to form, to male and to things of this kind; but earth corresponds to female and matter.

Now, since these things are thus oppositionally divided (*antidiêirêmenôn*) by essence, by power, by activity, by [being apprehended by different and opposed] senses and by location, there will be no single ordering of things nor one cosmos unless some bond comes to be between them and is a reciprocal association. For **it is not possible for two things**[63] **to be well combined in the absence of some third thing**. Plato has advanced a general proposition in saying '**some third thing**' (*tina*). But if you wish you can add the words 'entirely opposed' and you will produce an utterly irrefutable (*anelegktotaton*)[64] proposition and one that has been more subject to agreement. For to combine two *most opposite* things with one another into a single composite is impossible without the presence of some third thing. They will either come together by themselves or be brought together by something else. But it is impossible for them to come together by

I suspect that the suggestion that perception is the product of rays resulting from the aetherial nature of that which sees may be Pythagorean in its origins. Aetherial rays play a role in the account of perception in the Anonymi of Alexander Polyhistor (= D.L. 7.27 ff.). This would be consonant with the table of opposites that Proclus goes on to give. Aristotle's original table of opposites (*Metaph.* 1.5, 986a22), which he ascribes to the Pythagoreans, takes no account of matter and form, though it does oppose light (fire?) to dark (earth?) and male to female. But it is not hard to imagine that these oppositions were updated by later enthusiastic Neoplatonists.

63 Proclus' quotation here diverges from Plato's text and from his previous quotation in the lemma. There he gives the text: δύω δὲ μόνω καλῶς συνίστασθαι τρίτου χωρὶς οὐ δυνατόν. Here we have δύο γάρ τινα καλῶς συνίστασθαι τρίτου χωρὶς ἀδύνατον. It is possible that this is because he is now looking at a different manuscript than the one he was looking at earlier (Diehl ad 17.26). Or it may simply be inadvertance on Proclus' part. This may be compounded by the fact that 17.23–18.4 was tacked on to an earlier lecture in the course of Proclus' subsequent revisions (Festugière). For the question of discrepancies between lemmata and subsequent *theôria* and *lexis* in the commentary tradition, Festugière refers us to Praechter (1990).

64 Probably a neologism of the Athenian school. The *TLG* shows three occurrences of this superlative: two in Proclus and one in Syrianus. Needless to say, it is rather unclear what it might mean to use 'irrefutable' in a comparative sense.

themselves due to the conservation of their essences (*ousia*) since they are opposites, most distant from one another and even running away from one another. Therefore they must be brought together by another thing and this thing will be the bond. As a result, the opposites will require some third thing. And so the universe proceeded from a dyad to a triad. It originated from the dyad because all generation has an affinity with this principle, since Difference, the Unlimited and Empedoclean Strife[65] belong to generated objects. But for now the universe has proceeded just as far as the triad by virtue of the bond it requires. **18**

Once again, then, some third thing must be assumed as the middle term between earth and fire which brings them together. For example, let us suppose this is the wet which is common to both air and water.[66] After all, this is the kind of thing that connects earth since it cements it together and connects what has been spread around, but it is also a underlying subject (*hupokeimenon*) for fire, providing nourishment and stability to it. But from this triad the tetrad will shortly be revealed because the things to be combined are solids (32b). Therefore it is correctly said that the bond brings with it beauty, harmonious association and unification. But what this bond is and how it is immanent to the things that are bound Plato shows through the rest of the discourse:

By nature this bonding is best accomplished by proportion (*analogia*). (31c4)

C. Proportion is the finest bond (20)

It must be said that this proportion is the very bond that we are now inquiring into, and the middle term or the middle terms are said to be bonds in the third manner.[67] For the proportion is not only in the

[65] Cf. DK 17.8 and 19. Perhaps Proclus is not reaching too far to see an allusion to Empedocles. Festugière thinks that Empedocles' principle of Love is echoed at *Timaeus* 32c2. Perhaps one might add *Gorg.* 508a.

[66] Proclus illustrates his point with an example similar in some ways to Aristotle's theory of the elements (*GC* II.3, 330a30-b8). In what follows Proclus will reject Aristotle's account of each element as involving two contraries in favour of his own account according to which each has three features, two of which it shares with the elements on either side of it (II.39.19–40.2). The illustration is not meant to represent Aristotle's view. The moist is offered as a potential middle term between fire and earth for two reasons: its capacity to hold earth together and its capacity to feed fire. Cf. *Tim.* 43a1, [Aristotle], *Prob.* 934b20 for moisture as a cause of sand becoming cemented together. Note that Aristotle rejects the belief that fire is fed by moisture. He argues against those who hold this view, but does not attribute it to anyone by name, *Mete.* 2.2, 355a5.

[67] Festugière reads κατὰ τὸν τριττὸν τρόπον with Kroll rather than the τρίτον in the mss. He supposes that this 'threefold manner' refers forward to the discussion of arithmetic,

things that stand in the same ratio, but it is also *its own* binding principle as well as the bond of these terms – the former [it binds] through the ratios, but itself by preserving the same form, no matter what the numerical difference between the terms may be, and by preserving the One in the advance towards plurality.[68] It has this power from itself and in respect of its own definition (*logos*), and reasonably so. For proportion proceeds from equality, but equality is in the same column[69] as the One. For as the monad is the font and root of absolute quantity, so too equality is the font of all of the relations (*pros ti*), having the order of monad relative to the other relations (*schesis*).

19

Let us ignore the other means which are set out by the more recent philosophers – I mean Nicomachus[70] and Moderatus[71] and others such as them[72] – but concentrate instead on the three kinds of means that are now being spoken about and from which Plato establishes the soul: the arithmetic, geometric and harmonic ratios. It is possible to observe how all these can be generated from equality by the following rules.

The *arithmetic* ratio is established in the following manner. Make the first term equal to the first; the second term equal to the sum of the first

geometric and harmonic proportions at II. 19.7. This is certainly possible. However, I have kept the MSS reading supposing that this refers back to the middle form of bond discussed earlier. This is not the third bond introduced at 15.14–26, but it is the final option left uneliminated as the subject of discussion at 16.10. So with reference to this latter passage, Proclus might call it third.

[68] See Introduction, pp. 7–11 for the nature of proportions under discussion. Proclus' claim that each one 'preserves the same form' amounts to this: (i) in an arithmetic proportion, the number between each term is the same (for example; 2, 4, 6); (ii) in a geometric proportion, the ratio between the terms remains constant (for example, in 2, 4, 8 there is a constant ratio of 1:2 between subsequent terms); (iii) in a harmonic proportion, the fraction of the subsequent term by which the preceding term is exceeded is the same (for example, in 3, 4, 6, the 4 exceeds the 3 by $\frac{1}{2}$ of 4, just as the 6 exceeds the 4 by $\frac{1}{2}$ of 6).

[69] *sustoichia* evokes Aristotle's references to the Pythagorean tables of opposites. The arrangement referred to by Proclus is not found in Aristotle's account of the Pythagorean table. Cf. note 62 above.

[70] In the *Introduction to Arithmetic* of Nicomachus of Gerasa, one finds a total of ten means (cf. II.22.1). But, as Iamblichus notes in his commentary on that work, only the three under discussion are ancient (100.19–25 Pistelli). It seems likely that Proclus had access to both of these works. Indeed, Marinus tells us that Proclus fancied that he *was* Nicomachus in a previous life (*VProc.* 28)! On these various means, see D'Ooge (1926) ad loc.; Heath (1921) vol. i, 85–9.

[71] Moderatus of Gades (*c.* AD 50–100) was a Neopythagorean philosopher in somewhat the same vein as Nicomachus. This is the only point in the extant corpus where Proclus refers to him by name. Cf. Dillon (1996), 344–51.

[72] One finds similar discussions of means in Theon of Smyrna (early second century AD), *Mathematics useful for understanding Plato*. For the Greek text, see Hiller (1878); English translation Lawlor (1979).

and the second; the third term equal to the sum of the first, second and third. So that when we take three units, then, according to this rule, the series 1, 2, 3 will be produced which preserves the arithmetic middle. For the arithmetic middle is one in which the first term is less than the middle term by an amount equal to that by which the last term exceeds the middle one, just as the philosopher himself says (36a5).

The *geometric* middle is established in this fashion. Make the first term equal to the first. Make the second term equal to the first and second together. But make the third term equal to the first, plus two times the second, plus the third. So again taking three units, through this rule the series 1, 2, 4 comes to be, thus making a geometric ratio. For the defining feature of proportion is that it preserves the same ratio in greater and lesser terms.

The harmonic ratio, having the third position, is generated in a fashion somewhat like this:[73] Three units being set out, make the first equal to the first and twice the second; make the second equal to twice the first and twice the second; and make the third equal to the first plus twice the second and three times the third. According to this rule you will get the series 3, 4, 6 which makes a harmonic ratio. For in the harmonic ratio the middle term exceeds and is exceeded by the same part of the extreme terms according to the Platonic definition itself [36a4].[74]

Therefore all the middles have their genesis from equality.[75] But if this is so, then they have the characteristics of uniformity (*to monoeides*), the capacity of bringing together (*to synagôgein*) and making things one. For equality is analogous to Sameness, the Monad, the Limit and to Similiarity through which communion is introduced to things. For this reason Plato appropriately adds that bonding is 'by nature' best accomplished by proportion. Because all proportions and middle terms have such a quality innately, they do not impose a bond in a contrived manner nor through some ability foreign to them. Rather their capacity to accomplish this is made manifest in the very essences and the powers of objects.

[73] Reading καὶ αὐτὴ in 19.23 with Festugière rather than καὶ αὕτη; cf. 19.16.

[74] 4 exceeds 3 by 1, which is $\frac{1}{3}$ of 3, and 6 exceeds 4 by 2, which is $\frac{1}{3}$ of 3. In modern notation, if a, b, and c are in harmonic proportion, then $\frac{1}{a} + \frac{1}{c} = \frac{2}{b}$.

[75] In the arithmetic proportion the number by which *b* exceeds *a* is equal to the number by which *c* exceeds *b*. In the geometric proportion, the middle term stands to the last term in a ratio equal to the ratio it stands in to the first term. In harmonic proportion, the fraction or part of the middle term by which it exceeds the first term is equal to the fraction or part by which the last term exceeds the middle term. Hence Proclus' claim that in all cases the middles have their genesis from equality. See Olympiodorus' otherwise puzzling remarks on 'geometrical, arithmetical and harmonic equality' in his *Gorgias* commentary; Jackson, Lycos and Tarrant (1998), 235–6.

Now whenever of three numbers, solids, or powers (dunameis),[76] 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[77] – they will all of necessity turn out to have the same relationship to each other, and given this, all of them will be unified. (31c5–32a7)

D. Mathematical interpretation of Tim. *31c5–32a7*

It is first necessary to speak about what is said here in a mathematical manner, and then in a physical manner, since it is the latter in particular that is under discussion. For it is necessary not to detach our account from the primary subject we have set ourselves.

Note that there are some people who think that Plato defines the geometric middle through these words and, among many other things, they say that of all [the kinds of proportion] the geometric middle is properly called 'proportion', though the others might be justly called middles (*mesotês*).[78] Nicomachus is of this opinion and he speaks correctly.[79] For the geometric ratio is strictly or properly called proportion, though it is necessary to denominate the others 'middles', as Plato did earlier (36a), and this [use] has been carried on throughout the account of the generation of the soul. But to call these other cases which involve middle terms 'proportion' is an abuse of language.

Some are of the opinion that these people have not understood Plato's
21 thought here at all well.[80] For they say that it has not been specified in this passage that it is necessary that the *ratio* be the same. Rather, all that was said was this: that in all proportion it is necessary that the *relation* (*schesis*) that the final term must stand in to the middle be like the relation that

[76] The syntax and semantics of Plato's sentence are the subject of much debate. I have translated it as Proclus understands it. See Introduction, pp. 11–16.

[77] Plato here describes the relations between terms in continuous geometrical proportion. The sequence 2, 4, 8 is such a proportion, since it preserves the ratio 2:1. 'What the first is to the middle, the middle is to the last' since 2:4 :: 4:8. 'What the last term is to the middle, the middle is to the first', since 8:4 :: 4:2. 'The middle term turns out to be both first and last, and the last and the first turn to out to be middle terms' since 4:8 :: 2:4 and 4:2 :: 8:4. Cf. Cornford (1957), 45.

[78] Cf. Tracy (1969), Appendix I and D'Ooge (1972), 264 n. 2.

[79] I.e. those such as Nicomachus who would confine the discussion here to geometric proportion.

[80] Nicomachus, *Arith*. II.24.1; cf. Cornford (1957), 145.

the middle stands in to the first.[81] But *this* is common to all the middles that have been mentioned. For with respect to the arithmetic [mean], the relation between 1 and 2 is equal in *quantity* to the relation between 2 and 3, since that by which 2 is exceeded by 3, by this [same thing] 3 falls short of 4. And with respect to the geometric mean, as 1 is related to 2, so 2 is related to 4, for the ratio is the same. Finally in the case of the harmonic mean, as 3 is in relation to 4 – and the part of 3 by which it is exceeded by 4 – so too 4 is in relation to 6. For by that part of itself by which 3 is exceeded by 4, by the corresponding part of 6 is 4 exceeded by 6. These people arrange things in this manner even though Plato clearly assumes the geometric middle. For the distinctive character (*exaireton*) of this is that the first and middle terms and middle and third term go up in the same ratio.[82]

Since there are three middles – the arithmetic, geometric and harmonic – and since they are as we said (19.9), Plato plausibly assumed these three subjects (*hypokeimenon*): numbers, volumes (*ongkos*)[83] and musical values (*dynameis*). For the arithmetic mean is realized in numbers, but the geometric mean pertains particularly to continuous quantities, and the harmonic resides in musical values, since it has been established with reference to high and low [pitches].[84] And one might speak of them in this manner, distinguishing them by where they predominate. But it is possible to assume all of them in numbers, as well as volumes and musical values. How they are in numbers is obvious, for it has been explained. But then again they are also in volumes. For, assuming three equal magnitudes, you would be able to use the three rules that have been given to form other magnitudes, now making an arithmetic [proportion], now a harmonic and now a geometric one.

[81] Nicomachus, *Arith*. II.21.1 draws the distinction between the more specific and general sense of the term *analogia* by reference to the distinction between sameness of ratio or sameness of some relation other than that of ratio.

[82] For *exaireton*, cf. *ET* 24.12; 86.24.

[83] Proclus does not mean to restict attention to volumes in the strict sense of what is three dimensional. Rather, he understands volume here in terms of continuous magnitude. If Plato's point were restricted exclusively to the realm of mathematics, this might seem a bit forced. But as with *dynameis*, Proclus' understanding is not exclusively mathemetical. So it hardly matters if he uses a species of the continuous – volume – for the genus.

[84] For the associaton between the various proportions and their subjects, Festugière refers us to Proclus *in Euc.* 60.12. However, it must be said that Proclus does not suppose that these proportions are found exclusively in these subjects, though it appears that this is the view that Taylor ascribes to him (Taylor (1928), 99). Proclus thinks that these are the characteristic substrates for these proportions, but not the exclusive ones. Powers may be musical or they may be things such as hot or cold (II. 25.13). See Tracy (1969), 80.

And of course one could do the same thing with musical values.[85] For let there be three equal musical values – for instance, all *hypatai* 22 of the same pitch[86] – and naturally you make the arithmetic mean out of these if the first is equal to the first pitch laid down, say a *hypatê*, but you then make the second pitch equal to the first and the second.[87] (As for instance if one were to produce another pitch double to the first one. It will be the *nêtê* which has the ratio of 2–1 to the 5 *hypatê*.) Make the third equal to the first, second, and third. For it will be a sound having a 3–1 ratio to the *hypatê*, exceeding the *nêtê* by the same amount as the *nêtê* exceeds the *hypatê*.[88] These sounds will have

[85] For the Pythagorean tradition of relating mathematics and music, see Barker (1989). The Pythagoreans had discovered that when a string is stretched over a bridge so that its segments yield notes in the relations of an octave, a fifth or a fourth, the ratios of the lengths correspond to 2:1, 3:2 and 4:3 respectively. The text before us states these relations in terms of the musical vocabulary of the General Perfect System. Here I simply transliterate the Greek words for the notes in the scale. The full system is illustrated in Barker (1989), 12. Most of Proclus' remarks concern the central octave of the system. This system is bounded on the lower end by the *hypatê mêson*. (Let this be E.) This is separated by a fourth from the *mesê* (a). The *mesê* is separated from the *paramêse* (b) above it by a tone. There is another fourth separating the *paramesê* from the *nêtê diezeugmenôn* (e).

The tradition that the arithmetic, geometric and harmonic means are instantiated in music goes back to Archytas (fr. 2 = Porphyry, *Comm.* 93, 6–17, translated in Barker p. 42). When Archytas explains the arithmetic mean in music, he does not refer to specific notes or numbers. As Archytas says, 'the interval between the greater terms is less, and that between the lesser terms is greater'. This can be illustrated by the numbers 12, 9, 6. To see the point of Archytas' remark, we need first to see that the ratio of the one extreme, 12, to the middle term, 9, is 4:3. This is the interval of the musical fourth. The ratio between the middle term, 9, and, the other extreme, 6, is 3:2 or the fifth. Thus, the interval between the greater terms (12 and 9) is the fourth (i.e. the 'lesser' interval that Archytus mentions), while that between the lesser terms (9 and 6) is a fifth (i.e. the greater interval).

[86] Literally 'of the same tension' (*homotonoi*). We are to think of this in terms of the strings on a lyre of equal length and equal tension.

[87] In his illustration of the arithmetic proportion in music, Proclus decides to start with three units or notes of the same pitch. I think we may suppose that when he speaks of 'making the second pitch equal to the first and the second' that he has in mind doubling the length of the string involved in the production of the first note that he is using as a unit. As noted above, the interval between the notes produced by such lengths in a 2:1 ratio is the octave. He correctly identifies the note one octave above the *hypatê* with the *nêtê*, or in our notation E and e. However, things go badly wrong when he instructs us to make the third note equal to 3 times the unit. The notes produced by the strings in the ratio 1:3 or by those in the ratio 2:3 do not illustrate any of the standard harmonies.

[88] The sequence of numbers is 1, 2, 3. Realized as musical values, the first two numbers correspond to the interval of an octave, while the third number is a fifth above the second number. However, the note corresponding to the fifth above the *nêtê* is not part of the Greater Perfect System. In our notation, it would be b^1. It is certainly not the *tritê*

arranged themselves arithmetically in relation to one another: *hypatê*, *nêtê* and the *tritê hyperbolaion*.***[89]

You will make the geometrical [progression] from the assumption of *hypatai* if you make the first one equal to the *hypatê* that has been assumed, but the second to both the first and the second (thus establishing a *nêtê*, since it has a musical value twice that of the *hypatê*).[90] You make the third equal to the first plus twice the second plus the third, and this establishes a particular note (*tina chordên*).[91] For its (musical) value is twice that of the *nêtê* and four times that of the *hypatê*. These three sounds will make a geometric [progression].***[92]

All these [ratios] may be seen in numbers as well as in volumes and in musical values, but the number has been particularly adapted to the arithmetic [proportion], volume to the geometric and pitches to the harmonic. It is for these reasons that Plato has made use of these three things: numbers, volumes and musical pitches. And surely this is a good move because, having given a certain common account, he has made an origin or beginning from the middle terms. For this middle term is the one on account of which all proportions have been established, bringing

hyperbolaion, as the text goes on to suggest. For this is the name of the note immediately above the *nêtê diezeugmenôn* (a^1). As Winnington-Ingram points out in his notes to Festugière's translation, it helps nothing to emend the text to read '*nêtê hyperbolaion*' since this a fourth (3:4) above the second note. It appears that Proclus may be confused about the vocabulary.

89 Diehl posits a lacuna in the text here. The next paragraph, illustrating the construction of the geometric proportion, ends with a summary at line 15: καὶ ἔσονται τρεῖς οὗτοι φθόγγοι γεωμετρικὴν ποιοῦντες. Since this paragraph ends without a corresponding participle (καὶ τρεῖς οὗτοι φθόγγοι διαστήσονται ἀλλήλων ἀριθμητικῶς, ὑπάτη, νήτη, τρίτη ὑπερβολαίων), Diehl conjectures that something has fallen out.

90 I.e. the interval between it and the *hypatê* is an octave as in the previous example.

91 Proclus now needs a note that preserves the same 2:1 ratio as exists between the first and middle term. This will be an octave above the *nêtê*. This note will be well outside the range of the standard scale and does not have a name. Accordingly, Proclus simply says 'a particular note'. In his notes to Festugière's text, Winnington-Ingram speculates that Proclus might have supposed these higher notes to have names that he would discover, or perhaps remember. It may be that he wrote in 'a certain note', intending to go back at a later time to supply the correct term.

The Q manuscript attempts to correct this. It substitutes '*mesên*' for '*nêtên*' in line 11 as the second term of the proportion. The third term, an octave above this, can now be identified with the *nêtên hyperbolaiôn*. The attempt is only partially successful, since the proportion should start from the *proslambanomenos*. This note – not the *hypatê hypatôn* – is one octave below the *mesê*.

92 In his notes to Festugière's translation, Winnington-Ingram questions Diehl's decision to mark a lacuna at line 8. The construction of the harmonic proportion is missing. Perhaps something has fallen out here. Or perhaps Proclus set this difficult point to one side for the moment and the text never contained a treatment of the harmonic proportion in music.

together the extreme terms with respect to the ratio and carrying the ratio from the one value to the others. For proportion is the bond *par excellence*. It is a bond as well as a mean inasmuch as it is the 'that through which', for the proportion joins the extreme terms through it. Through this fact, Plato has made it an origin or first principle because it is most appropriate to the nature of proportion, and also because relations are perfected through it. (And it is on this account that relations too are called middles.) [Second, he makes an origin from the middle terms][93] because sameness is the goal of all such proportions. For since [analogy] **23** has proceeded from equality, but equality is a particular kind of sameness, all things revert upon equality and sameness. One *might* say that, strictly speaking, sameness is set over the geometric proportion – for the ratio [between the terms] is that of sameness or identity – but equality is set over the arithmetic proportion,[94] while similarity is set over the harmonic.[95] Thirdly, because the ascent to unification goes by way of sameness. For the relation that has come to be between the terms in the proportion depends on equality. But equality depends upon sameness and sameness upon unification.

E. Physical interpretation of Tim. *31c5–32a7*

1. Why a physical consideration is necessary

After taking up the meaning of these words from a mathematical point of view, it is necessary to be directed to the consideration of their meaning with respect to physical theory. For it is not appropriate either to get bogged down in these mathematical aspects and suspend the rest of the discourse (for the dialogue is about physics) or to ignore the preceding words and examine only that which bears on the sensible realm. Rather it is necessary to bring both aspects together and constantly interweave the mathematical with the physical, just as the things themselves are woven together and are of the same kind (*homogenês*) and akin (*adelphos*) in respect of proceeding from Intellect.

In general, if the Pythagoreans arranged mathematical being as a middle term between intelligible and sensible things – in so far as the mathematical is more explicit (*anelittomenên*) than the intelligibles, but

[93] Festugière is surely right to mark this as second point in the discussion. Cf. 23.5: καὶ τρίτον ὅτι etc.

[94] Since the interval between the first and middle term is equal to the interval between the middle and last term.

[95] Since parts by which the progression 3, 4, 6 proceeds will be similar; e.g. 1 and 2 are similar in respect of being one third of 3 and 6 respectively.

more universal (*katholikôteran*) than sensible things[96] – why is it necessary to leave out these things and think about physiological matters alone? For how has the sensible been set in order? In respect of what kinds of rational forming principles (*logoi*) has it been arranged, or from what manner of ratios (*logoi*) has it proceeded, unless it be from the mathematical ones? Certainly these reasons are primarily in Soul, having descended from Intellect. Next they come to be in bodies from being in Soul. But on the other hand,[97] it is also necessary not to dwell [too much] on the mathematical [parts of the dialogue] as some do. For this too engenders false opinions in the audience in as much as they come to think of physical figures being the same thing as mathematical numbers. And it is absurd in another respect too. For the reasons (*logoi)* that govern Nature are not receptive of the accuracy or the fixity of mathematicals. [This is itself sufficiently absurd without] reference to the canons of demonstration on this matter, where it is said that the scientific knowledge gained from one genus may not be carried over to another.[98] Therefore it is not possible to consider physical things arithmetically.

2. *What is the first physical proportion?*

Let us pass on then, if you please, to the consideration of the foregoing mathematical relations from the physical point of view (*physikôs*). There is the first proportion through which nature puts harmony into its own works and through which the Demiurge organizes the universe – a certain single life and one reason (*logos*) running through itself primarily

24

[96] Festugière refers to the doctrine attributed to Plato by Aristotle in *Metaph*. 987b14, that the numbers lie between the Forms and sensibles, differing from the latter by being eternal and unchanging, but from the former by virtue of the fact that there are many mathematicals of the same kind but only one Form for each kind. But in Aristotle's report, the Pythagoreans make the numbers primary substance – not something between primary substance and the sensibles. Festugière conjectures that Proclus intends to assimilate the Old Academy to the Pythagorean school.

[97] Reading δεῖ <δὲ> δὴ οὖν μὴ μένειν ἐπὶ τῶν μαθηματικῶν in 23.25 with Festugière.

[98] In *An. Post*. 1.32, Aristotle argues that it is not possible that all demonstrations should have the same *archai*: 'the principles of them are different in genus and do not apply – e.g. units do not apply to points, for the former do not have position while the latter do' (88a32). Barnes (1975) supposes that the chapter as a whole is directed against a vision of all the sciences sharing common axioms – a vision plausibly thought present in Plato's *Republic* 511b. Proclus however, seems to cite Aristotle's dictum with approval. Philoponus' commentary on this part of *Posterior Analytics* (313.22 ff.) betrays no hint of concern that there is an incompatibility between the philosophers on this point. No relevant portion of Alexander's *in An. Post*. has been preserved and Themistius' paraphrase is not a very critical work. It would be nice to know whether what we moderns take to be the anti-Platonic point of this passage was widely appreciated in the commentary tradition.

and then through all things – and then, connecting the things in which it is, it is that in virtue of which sympathy or co-affection (*sympatheia*) comes to be among all the things in the cosmos, inasmuch as all things are guided by one life and a single nature. The proportion which is the bond of all whole things is brought into being by Universal Nature, and by the one Soul; and it is also engendered by the one Intellect, and inevitably the greater beings introduce a larger and more perfect unification to the things within the cosmos. Let us therefore say that the state (*hexis*)[99] is what connects the subjects and material forms, and is also the [basis of the] powers of the middle elements. But nonetheless we shall declare all these things to have the status (*logos*) of the *that without which* and to be analogous to the middle terms in mathematics through which the relation is present to the extreme terms. But with respect to the Life Itself that brings about the coordination and unification of all things – while it depends upon appropriate causes, it also binds those things in which it subsists, and preserves its own unity and that of the things that partcipate in it – this life is genuine (*ontôs*) proportion.

So again we see that there are three senses in which something may be a bond. In one sense, these common qualities of the elements are a bond. In another sense, the single cause of bodies [is a bond]. Third, there is the middle between both [of these]. On the one hand, this bond proceeds from the cause, but on the other it makes use of the particular qualities attached to bodies. And this is the strongest bond, as the theologians say, since it has been stretched through all things and connected by a golden chain (*Orph. fr.* 166, Kern). According to the Theologian,[100] Zeus establishes the golden chain on the advice of Night:

> When you have stretched round the strong bond over all things
> A golden chain is suspended from the aether.

Since physical proportion is a thing such as this, let us examine *in* what things and *through* what things it is naturally co-established.

3. The subjects in which physical proportion exists

25 With respect to that *in which* it is found, as Plato says (31c5), it is in numbers, volumes and powers (*dynamis*). Physical numbers are enmattered

[99] Festugière supposes that Proclus means to contrast the Stoic notion of *hexis* as a principle of unity with his idea of a single life and *logos* that permeates everything. Proclus' physiological realization of the bond of proportion – the single life and *logos* – differs from Stoic *pneuma* in being both immanent and transcendent.

[100] Reading παρ᾽ αὐτῷ for ἐπ᾽ αὐτῷ at 24.25 with Kroll.

forms, the things that are divided around subjects. But the volumes are the extensions of these [physical numbers] and their spatialization associated with matter. But the powers are <the qualities>[101] that connect bodies and make them have form. For the form is one thing, but the power that derives from it is another. The form is impartible (*amerês*) and substantial (*ousiôdês*), but once it has taken on extension and volume, it sends forth from itself the enmattered power like an exhalation (*pnoê*) and this is a particular quality. Take fire for example. The form of it and its substance is impartible, since it is the genuine representation (*agalma*) of the cause of fire (for there is something impartible among the things which have parts (Arist., *Metaph*. 968a2)). But though it [proceeds] from the form in an impartible manner, in the fire there comes to be an extension and interval associated with the matter. From this [i.e. extension] the powers of fire have been projected (*proballein*), such as heat or cooling or dampness or some other thing such as this. These qualities are substantial (*ousiôdês*), but they are by no means the being or essence (*ousia*) of fire. For essences do not come from qualities, neither are essence and power the same thing, but rather everywhere the essential (*to ousiôdes*) comes before the power. From this one thing [i.e. the essence] proceed a plurality of powers, and from the indivisible [essence there come to be] divisible [powers]. It happens again in this fashion when multiple activities (*energeiai*) come to be from a single power. For the more that each thing proceeds, the more it is made a plurality and divided, though in relation to its own principle and cause it is impartible and indivisible.

Since these three are in each body – I mean number, volume and power – proportion or the natural bond surmounts[102] [bodies] from above by means of numbers, volumes and powers. It brings together their impartible essence into one in order to bring about a single cosmos. It introduces communion into forms, symmetry into bodies and harmony into powers and in this way it brings it about that all things stand to one another like rational numbers and terms in a proportion.[103] This proportion proceeds from the middle to the first term, and from the third to the middle, from the first to the middle, from this to the last **26** and from the last again to the the middle and from this to the first.[104] This is because a bond of this sort provides procession and reversion

[101] Diehl inserts these words from the scholion to M.

[102] Cf. *Plat. Theol*. III. 19.27 and IV. 113.12.

[103] '*rhêta*' and '*homologa*' are technical terms in mathematics denoting, first, quantities that are rational in relation to one another (Euclid 10, def. 3) and, second, terms that are in the same proportion (Euclid 5, def. 11). Cf. Plato, *Rep*. 546b.

[104] Plato's characterization of the relations involved in continuous geometric proportion, *Tim.* 32a1–5. See n. 77 above.

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 defining feature), but proceeding from the first through the middle to the last (in as much as it extends and develops itself right down to the last things), and then running back up from the last to the first (in as much as it reverts all things through harmony to the intelligible cause from which the division of nature and spatialization of bodies have come about). The reversions toward this cause form a single circle, one order and one series of secondary things depending upon unities prior to them, and make the cosmos maximally similar to the intelligible. For as all things up there in the intelligible realm are unified in relation to one another, so too all things here have been joined together. Further, in as much as the things up there have proceeded from the good and have reverted once again to it through the goodness in them and through the intelligible henads, so too surely these things here, since they have proceeded from the Demiurge, have reverted once again upon him through this bond which has been divided among, and runs continuously through, all of them and binds them together. For the placement of these bodies imitates the order in the Demiurge.

Moreover, in these cases the middle term is present to both extremes and the extremes are present to the middle.[105] For all things are in all and participate in the nature of one another. The sensible cosmos imitates the intelligible cosmos in this respect and, just as in that realm all things are in all but in a manner appropriate to each – intelligibly in the intelligible, but intellectually in the intellect; universally in the wholes, but partially in the particulars – in the same fashion the sensible cosmos also has all things with respect to all the parts of itself.

In fact, fire in so far as it is tangible participates in earth. And earth, in so far as it is visible, participates in fire; and each participates in moisture. Through participating in dampness earth is coagulated and that which is dispersed in it is unified and connected. [At the other extreme] fire is fed and nourished by its participation in dampness.[106] So then, the middle
27 term is [present to] the extreme terms[107] in order that what has been said may be clearly illustrated by a physical example involving things 'more familiar to us' (Arist., *An. Post.* 71b33). And therefore the extremes are present in a way to the middle in as much as they preserve the appropriate form through this and remain such as they are. Again, the wet, in so far as it is coloured and in so far as it is warmed again by heat, participates

[105] Lit. 'the middle is all things and the final terms are the middle'.
[106] Cf. II. 18.8–19 above.
[107] This reverses the word order, but it is surely what the example shows.

in fire.[108] But in so far as the wet is tangible, once again it participates in earth. So that [the wet] is made to have both qualities by the extreme terms.

So much for this – though in a short while these things will be made even more clear to us when, through this harmony and proportion, first Sameness, and after this Unification are revealed. For though bodies themselves in respect of their own natures are divisible and dominated by Difference and Strife, these things nonetheless become akin to Sameness through harmony and through Sameness they in turn become akin to Unity. For the universe is made one through proportion since this has the power to unify things that have been divided, bring together what has been spread around, and connect what has been dispersed.

And it is surely for this reason that the theologians who consider the causes of these things to be with the gods, having shut Aphrodite up with Ares, surround them both with the chains of Hephaestus (*Od.* 8.266) – Hephaestus being the cause of the way differences are connected in the cosmos through harmony and friendship and this whole interweaving.[109] And through these demiurgic bonds they have interwoven Sameness with Difference, harmony with separation, and association with opposition. And Apollo laughs at them, and Hermes laughs, and each of the gods laughs (*Od.* 8.322). For their laughter gives

[108] An odd example. At least with respect to water – a paradigm case of moisture – the commentators generally deny that it has colour; cf. Alex. *DA* 44.6; Simplic. *in DA* 155.10.

[109] The passage from Homer alluded to here is regularly commented on by literary critics and especially the Neoplatonists. In it the bard Demodocus relates the story of Aphrodite's infidelity with Ares and the revenge of her husband, Hephaestus. Hephaestus contrives invisible chains around the bed and then pretends to leave so as to give the lovers the opportunity. They take it and are entrapped. Hephaestus then invites the rest of the gods to look at what he has caught and they laugh at Ares and Aprhodite, applauding Hephaestus' cleverness. Plato's *Republic* condemns this story, along with the seduction of Zeus by Hera (*Il.* 14. 294), as not fit for young listeners (390c). As a result, it becomes important for Neoplatonists who would take Homer as a source of divine wisdom to find readings of this passage and of *Republic* that allow Plato to get along with the greatest of the poets.

The 'theologians' to whom Proclus refers in this passage are probably those who propounded allegorical readings of this Homeric tale. We find an allegory of Aphrodite and Ares in terms of Empedoclean Love and Strife in Heraclitus' *Quaestiones Homericae* §69. (This Heraclitus is, of course, the allegorist of the first century AD – not the Presocratic philosopher.) Proclus' own allegorical reading is given in *in Remp.* I.141.4–143.18. Hephaestus symbolizes the hypercosmic Demiurge of the sensible world, an identification that he seems to have taken over from Syrianus (cf. *in Metaph.* 83.1–11 with Proclus *in Tim.* II. 70.21–31). Ares is symbolically associated with the encosmic division of the universe by opposing forces. Aphrodite, symbolizing beauty, is needed by both for their respective tasks. Since Ares operates at a lower metaphysical level than Hephaestus, his unification with beauty is said to be adultery in relation to Hephaestus' lawful marriage. Cf. Lamberton (1986), 228–30, Sheppard (1980), 80–2.

subsistence (*hypostasis*) to the things in the cosmos and puts power in the bonds.[110] But with respect to these things let us, as they say, observe 'religious silence'.[111]

For the present moment, however, let us review the things that ought to be clear from what has been said. First, since the physical bond is Hephaestean and demiurgic – for the single and perfect Demiurge encompasses the 'works of necessity' (*Tim*. 47e3), this being Hephaestean, and in addition contains the Dionysian[112] production which brings about each whole of the parts of the universe – this bond is such as to bring together opposites and connect material things, unifying their being (*ousia*), measuring their volumes, and harmonizing their powers; accomplishing all things in all and exhibiting the same things in each other in every mode: in the mode of fire, and of air, aquatically and terrestrially.

F. Why there must be at least four elements

Therefore if the body of the universe had come to be as a plane, having no depth, a single middle term would have been sufficient to bind both it and the things with itself (sic).[113] **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.** (32a7–b3)

Our purpose (*skopos*), as has been said (II. 2.9), is to discover what the universe is composed of and how it is conjoined. Since the proposed end is of such a nature, it is possible to see how the account contrives the composition of the four elements in a well-ordered manner. It is

[110] Proclus treats the laughter of the gods in *Iliad* 1.599 at *in Remp*. I. 127.29–128.4. Like the tears of Helios for Phaethon (*in Tim*. I. 114.1 ff.), the laughter of the gods symbolizes their providence. Cf. Sheppard (1980), 81.

[111] Diehl refers to Herodotus 2.171 for this phrase. Certainly some of the Neoplatonists employ it. See Porphyry, *Abs*. II. 36.22 and Proclus, *in Remp*. II.298.7.

[112] Festugière refers the reader to *in Tim*. I. 446.5 ff. where Proclus identifies the Dionysian creation with causes of the forms of things which are monadic but not wholes. It is not immediately obvious how this relates to the passage before us. Perhaps the better explanation of things being brought about in a Dionysian manner is II. 197.18. There Proclus tells us that the Demiurge (again identified with Hephaestus) acts in ways that are simultaneously Dionysian and Apollonian when he produces the soul. He acts in the first manner when he divides wholes – presumably the portions of soul stuff – into parts. But he acts in the Apollonian mode when he harmonizes the divided parts with respect to one another.

[113] The OCT for Plato very reasonably prints τά τε μεθ' αὑτῆς συνδεῖν καὶ ἑαυτήν rather than the τά τε μεθ' ἑαυτῆς ξυνδεῖν καὶ αὑτήν found here in Proclus' lemma. Proclus drops the reflexive entirely when he glosses the passage at 15.31–16.1: ὁ δὲ αὖ Πλάτων προσέθηκεν, ὃς ἂν αὐτόν τε καὶ τὰ συνδούμενα ἓν ποιῇ.

impossible that there should be one simple element only, for then there would be no generation, since all generation is a kind of change (*metabolê*) and all change by nature comes to be between two things. Now, all generation is out of opposites, but a simple element itself is in no way opposed to itself. If it were, it would be such as to destroy itself. If therefore it is necessary that there should be generation, it is also necessary that there should not be just one element. Things are just as Hippocrates said: 'If a man were [composed of] one [kind of substance], he would not feel pain or illness.'[114] For pain is an overabundance of a thing and an absence of measure. Therefore, there being at least two things, there is such thing as pain. In the same manner, we say that if there were only one element, things would not change. For motion and change is not into what is similar, but rather into what is opposite. Therefore it is not the case that there is just one simple element. But if it is not the case that there is **29** one, but rather there are at least two, it is necessary that these things should be opposites. For generation takes place from opposites. So it is necessary that these two elements have a nature opposite to one another. But surely if they are opposites, a kind of bond or middle is needed. For it is impossible that two opposites be well combined without some third thing. In order for there to be a bond in the middle, it is necessary for something to happen to bring them together. Since these things are opposites they will flee from association with one another, and so it is necessary that there be some other third thing to connect them and lead them into a single composition. But it is further necessary that this middle term be dual in form (*duoeides*). If, on the one hand, the elements which were connected were planes, a single middle term would suffice. But since they are solids, they are connected through two middles. Now, as the dyad is such as to originate (*archêgos*) the solids, it is allotted to it to be the primary cause of the things that are bound in it. And on account of this Timaeus called this sort of binding 'harmony' (32b3) because it institutes between the extreme terms a symmetry of association between one another. But the proportion in solids is also brought about through two middle terms; for given two similar solids, there will be two proportional middle terms. So surely if these things have been correctly stated, all the elements will be four in number and not merely one (in order that change should not be abolished); nor will it be the case that there are

[114] *On the Nature of Man*, 2. Hippocrates also argues that generation requires at least two things, but not from the premises that Proclus uses. Rather he points out that even when we have many things (e.g. a man and a wombat) generation may not take place. It requires two animals of the same species. If we cannot then make more things of a particular kind out of just any old plurality, how is it reasonable to expect that there should be generation (of any kind?) from just one thing?

just two opposites without a third thing (in order that there should be a bond between the two opposite elements that contend with one another. For there will be no cosmos composed out of things that are maximally different from one another, but if you should have happened to conceive that there was something of this sort, it will be something susceptible to destruction.) But neither will there be only two things which are *not* contraries, for they will be unable to do anything to one another. For what is white is not affected by a line, but by what is black, nor is what is hot affected by whiteness but rather by coldness.

Therefore once again it must be said that were we to be led back to something more general (*katholikôteron*) from these familiar examples, it is just the proposition that either there is one element or it is not the case that there is one element. But surely if the cosmos is constituted from just one element, the diversity of appearances has been abolished along with the oppositions of the peripheries[115] and the conflict of generation; and either all things will be everlasting or all things will be destroyed. But if there is not [just] one then there will be two or more. But if there are two they will either be opposites or they won't be opposites. If they aren't opposites, then once again none of the bodies will do or undergo anything, nor will there be oppositions or generation among things that supposedly have a generation. If, however, the two existing elements are opposites, it will be necessary for there to be middle terms. But if there are middles, then there must be either one or two of them. Now there can't be just one, for the elements are not two-dimensional planes. Therefore there are two middles. So if there are two middles the total number of elements will be four. From these things it is clear then that such a number of elements suffices for the constitution of the universe.

1. Mathematical exposition

Let us now move on, if you please, and first let us take up briefly as we did before (20.19 ff.) the mathematical facts themselves. Then we will go on to examine the implications for physical theory by looking at individual phrases (*lexis*). Let us consider, on the basis of the numbers themselves, how it is that two similar planes have one middle term while two similar solids have two middle terms. For one must get comfortable[116] with the

[115] Festugière supposes that Proclus has in mind here the different motions of the circle of the Same and the circle of the Different and the corresponding motions of the outer sphere and the spheres of the celestial bodies embedded within it.

[116] Reading ἀσπαστέον with Festugière for ἀσπαστίν.

originary form (*archoeidês*) and innate character (*autophuês*) of numbers prior to geometric necessity.

a. Means between numbers

i. Plane numbers

Let us therefore take two square numbers, 9 and 16, to start with. Clearly the smaller of these has a side of 3 while the larger has a side of 4. By multiplying these we obtain 12 which makes a proportion having these three terms: 9, 12, 16. But now let us take two numbers which, though they are not squares, are nonetheless similar plane numbers – let it be 18 and 32, the first of which is generated from 3 and 6 while the second is from 4 and 8.[117] If we multiply either 3 by 8 or 6 by 4, we get 24 and this creates a proportion between 8 and 32 in the ratio 1 to $1^{1}/_{3}$. The cause of this is that the sides of the planes have the same ratio.

Therefore, if the sides of the assumed planes are such as to lack a middle term that establishes a proportion between them, then the similar planes generated from these sides will be bound together by just one middle term calculated according to the method we have just discussed. **31** But on the other hand, if the sides *do* admit of a certain sort of proportional middle term, the planes generated from them will necessarily have more than one middle term. For let us suppose, if you like, two square numbers – 16 and 81 – the sides of which will be 4 and 9 respectively. Now 6 is a geometric mean term between 4 and 9 since each term is $1^{1}/_{2}$ times the previous term and it is necessary that more than one middle term should fall between them. For 4 multiplied by 6 makes 24. But 6 multiplied by itself makes the square of 6, 36. And 6 times 9 is 54. And so [when one multiplies all the possible combinations] it results that there is continuous [geometrical] proportion in the terms 16, 24, 36, 54, 81.[118] Therefore there is more than one middle term when the sides have a geometric mean. For this reason it seems to me that Plato is entirely circumspect and does not say that universally there is *one* middle term between two similar planes, but rather that it is *possible that* one term will be sufficient. For even when there is more than one, just the one middle term is sufficient to bring them together. So surely 81 is conjoined to 16 by one term alone – that is, 36, since each term exceeds the next by $2^{1}/_{4}$ times. So much then for the case of similar plane numbers.

[117] These are 'similar' plane numbers because 3:6 = 4:8 (Euc. 7, def. 21).

[118] Note that the differences between these terms are in order 8, 12, 18, 27, or 2^3, $2^2 \times 3$, 2×3^2, 3^3. These numbers are taken up in the discussion of cubes, *dokeis* and *plinths* which immediately follows.

ii. Solid numbers

Let us pass on to the case of similar solid numbers and consider the middle term among them. First, let there be two cubes, 8 and 27. The one has a side of 2 while the side of the other is 3. There will be two middle terms for these cubes in the following manner. The one comes to be from 2 × 2 × 3 or 12 and through this composition is called a 'beam' (*dokis*). The other mean comes from 3 × 3 × 2 or 18 and is called a 'brick' (*plinthis*).[119] These make a continuous proportion between the cubes we stipulated in which each term exceeds the next by 1½ times. You can also see how each of the middle terms has two sides from the cube next to it and the remaining one from the other cube. And this fact will prove useful to us in relation to the study of physical nature (II. 39.24).

Moreover, if the numbers were not cubes but only similar solids, it will still turn out that they have two middle terms between them in geometrical proportion. For let there be two similar solids, 24 and 192. The sides of the first one are 2, 3, 4 while the sides of the second are 4, 6, 8. From 2 × 3 × 8 we get 48. But from 4 × 6 × 4 we get 96. There will then be a proportion through the ratio 2:1 connecting the sequence 24, 48, 96 and 192. Now, in this case each of the middle terms has two sides from the similar solid that forms the extreme term next to it, but only one side from the other extreme term. It is just as in the previous case. Therefore, in the case of similar solids, two middle terms are sufficient for a proportion, just as Plato said: two middle terms are required to harmonize solids and one middle term will never do (32b2).

But what about this, someone might object: between the two solid numbers 64 and 729, isn't just one mean sufficient, 216? 64 is 4 cubed, while 729 is the cube derived from 9. 729 is also the three times 216 plus ⅜ of 216. And 64 stands in the same relation to 216, for each has the remaining one 3 and ⅜ times.[120] This is the case not only with respect to these numbers, but with respect to others as well. These, however, are the smallest numbers to admit of this property.

But it also must be said in response to this objection that the numbers under discussion are both cubes and squares at one and the same time. The one, 64, is the square of 8, while the other, 729, is the square of 27. Therefore, there is a single middle term between them not insofar as they are cubic numbers, but by virtue of the fact that they possess this

[119] Cf. Nichomachus *Arith*. II.17, 6 and Theon 41, 8. The names derive from the shapes of the solids that would be generated by considering the factors as determining height, depth and length. Cf. *in Remp*. II. 37.10 and D'Ooge (1926), 256.

[120] Reading αὐτοῦ with Festugière and Kroll rather than αὐτῶν.

defining feature of square numbers. For if you take the square root of 64 (I mean the number 8) and multiply it by 27 (which is the square root of 729), you get 216 as the middle term according to the method that has been described for finding the mean term between squares. Therefore, the person who puts this objection uses solids not just in so far as they are solids when he says they are bound by a single middle term. But if he had considered them *qua* solids and *qua* cubes, he would find that there are two middle terms between them. The one is 144, which is $4 \times 4 \times 9$. The other is 324, which is $9 \times 9 \times 4$.

b. Democritus' problem and its solution

i. The problem explained

Democritus[121] raises a puzzle: how can it be said that one proportional middle term falls between two planes? For if one assumes four lines that are successively proportional, it is possible to show that the quadrilaterals generated from them are proportional. So it will turn out that *two* proportional middle terms will fall between the plane numbers that form the extreme terms.[122] He also says that other people have been thrown into other difficulties through this puzzle and have strayed into the doubling of the cube and other such investigations.[123] But Democritus claims that what Plato says is that it is not between any old planes that there is to be found one middle term, but rather between

[121] A Platonist of the third century referred to by Longinus (ap. Porphyry, *VPlot*. 20.31).

[122] The objection seems confused. Plato's point seems to require, minimally, that while one can establish a continuous geometric proportion between planes through one term, one can only establish a similar proportion between solids through two terms. Democritus points out that we can establish two means between quadrilaterals based on sides that, considered in themselves, are successively in proportion (λαβόντα τέτταρας γραμμὰς ἑξῆς ἀνὰ λόγον, 33.15). Let the four lines in proportion be of length 2, 4, 8, 16, preserving a 2:1 proportion. The squares generated from these – 4, 16, 64 and 256 – will be plane numbers having two middle terms that preserve a 4:1 ratio, viz. 16 and 64. Does this damage Plato's point? No. For there is also a *single* term in geometric proportion between the extremes that preserves the 8:1 ratio, viz. 32. The same thing holds good if the quadrilaterals are not squares but merely similar planes. If, on the other hand, the figures are generated in such a way that the same ratio does not obtain between the lengths of the additional sides in each case, it is not even true that the resulting figures are proportional.

[123] The problem that Proclus refers to here is that of finding a solid, specifically a cube, with a volume double that of a given solid. Hippocrates of Chios is credited with discovering that this problem requires finding two mean proportionals in continuous proportion given two straight lines. Presumably the cause for wandering from Democritus' problem to this one is that both involve a sequence of two geometric means given two lines.

similar planes that have sides in a rational ratio, and ones in rational ratio that accord with determinate numbers.[124] For the things that come to be from the demiurgic god have a rational relation to one another[125] and are adorned with demiurgic numbers, as Plato will go on to say (39c–d). It is necessary to assume similar plane and solid numbers, and when one looks to these one can see the truth of the Platonic doctrine. In addition, at the end of the work we will show how to discover two
34 proportional middle terms given two straight lines, picking out Archytas' construction proof rather than that of Menaichmus, because the former uses conic lines.[126] And similarly I will prefer it to Erathosthenes because he uses the application of a rule.

Concerning the things under investigation, it must now be said that it seems in truth that Plato based his confidence on what has been shown in the case of *numbers*. For in the case of *figures*, it is possible to discover two similar solids with one proportional middle term. Let there be three proportional straight lines, 2, 4, 8, in the 2:1 ratio. The squares generated from these will have areas that are in the 4:1 ratio: 4, 16, 64. And the solids generated from these squares will be in the ratio of 8:1, i.e. 8, 64, 512. Therefore there will be three cubes, and the largest and smallest ones will have one proportional middle between them. And it is obvious that all cubes are similar to one another since their angles are severally equal and are enclosed by similar planes that are equal in number.[127] In addition, we can also show in this fashion that *two* proportional middle terms can be found between two similar solids, as Democritus showed. It is obvious that all squares are similar to one another, for their angles are severally equal and their sides are proportional.[128] Therefore it seems that Plato, working from numbers, shows that **solids are never conjoined by a single middle term but always by two middles**. For in these cases, as you see, the extreme terms in the proportion are at the same time both cubes and similar planes. In our previous example

[124] It is unclear how Democritus' observation is apposite to the non-problem he seems to have raised. It is not generally true of plane numbers that between any two there is a single geometric mean. In fact, as Euclid 8, prop. 20 shows, the existence of such a single middle is a sufficient condition for two plane numbers to be similar.

[125] They are *rheta*, cf. n. 102 above.

[126] For the solutions, including those of Menaichmus, Erathosthenes and Archytas, see Heath (1921), vol. ii, 244–70. The discussion that Proclus proposes to append to his *Timaeus* commentary is not mentioned anywhere else. Cf. Zeller (1963), 840.

[127] Mugler (in Festugière) refers us to Euclid 11, def. 9 and notes that Proclus' condition that the angles be equal is superfluous.

[128] Cf. Euc. 6, def. 1. Note that the concerns about whether Euclid's definition of similar rectilinear figures provides a sufficient condition do not apply to the case of squares since here we may be certain that the corresponding sides are opposite the equal angles; Heath (1956), vol. ii, 188.

one extreme is 512 (which is the product of 16 and 32), while the other extreme term is 8 (which is the product of 2 and 4). And so the ratio of the sides is the same [i.e. 2:1]. Therefore, there is one middle term between these in as much as they are similar planes, not in as much as they are solids. As a result, if you take these things in terms of number, you will have a solution to the problem. For it is possible to seek out *numbers* that are at the same time solid numbers and similar plane numbers, but it is hopeless to take a *figure* to be both a solid and similar plane. In addition, it is also possible to say that, since all of them are cubes, their form is one. Since Plato assumed that the mean terms are similar to the extreme terms, he would thus have been confident in the theorem. For how could it be natural that they require another bond if they all have the same form? And how would the middle terms both have something in common (*koinônoien*) with the extreme terms and yet also differ from them in respect of the sides if all were cubes? It is therefore obvious that he takes the middle terms as genuine (*alêthôs*) middles and thus says that there is never one middle but always two middles which connect the solids – all middle terms purporting to both have something in common and also differ from the extremes between which they are middles. For to say absolutely that all solids are connected through two middle terms makes the middles unlimited in number. So it is surely obvious that he assumes the things that are most widely separated and in every way opposed and have all their sides inconsistent with all the sides [of the other] – the powers corresponding to the physical bodies are like this.[129] He assumes this in order that one of the middles might have a greater association with one of the extremes and a lesser one with the other one, and likewise, *mutatis mutandis*, in the case of the other.

ii. Solutions of Syrianus and Proclus

Unless this is also true, the very thing that our teacher Syrianus said – he said that it is necessary to assume the same ratio in the middle terms as exists between the edges of the extreme terms.[130] For example, if one

[129] Reading οἷαί τινες for αἵτινες with Kroll. The passage refers forward to the theory of the four elements as characterized by three powers each. Fire is tenuous, sharp and highly mobile while earth is dense, blunt and immobile. These powers are treated as analogous to the three 'sides' or factors in a solid number. Since the powers are utterly opposed, there is a sense in which they are in proportion to one another. Thus fire and earth can be treated as 'similar' solids between which we will find two mean terms – air and water. Cf. II.39.24–30.2.

[130] Syrianus' point is not very clearly expressed – 'très elliptique' as Mugler says in his notes to Festugière's translation. The ratio between the edges or cube roots of the extreme terms is 2:3. There is just one number that stands in the ratio 2:3 to 8. This is

cube is 8 and the other is 27, we might discover the middle between them if we were to take the sides of them – 2 and 3 respectively – and were to multiply these by one another and then multiply the product by each one in turn [i.e. 2 × 3 × 2 and 2 × 3 × 3]. The middles that connect the extremes will do so through the ratio 2:3 which is the same as the ratio between the sides in the cubes from which we started. Now, Plato would say, since there is the same ratio between the edges of the cube as between the middle in the proportion, of necessity there are two middle terms. And this is more consistent with the proposed physical theory. For the Demiurge established [rational] relations (*koinônia*)[131] between the qualities of the elements and among the simple forms prior to the composites [generated out of these].

But for our part, we have assumed extreme terms connected by the 8:1 ratio, while their edges [or cube roots] do not have this same 8:1 ratio. If the edges of the middles are in the ratio 2:1, the edges of the extreme terms will have a 4:1 ratio. For example, in the case of the three terms assumed above (34.8), if we were to take a fourth proportional term we will find that since its edge is 8 times the edge of the first term, this fourth cube is conjoined to the first by the ratio 8:1. For example, if we add a fourth term, 16, to the series 2, 4, 8, the cube from 16 is conjoined to 8 [or 2^3] through the ratio 8:1 – the same ratio which 8 has to 64, and 512 has to 64, and 4096 (which is 16 cubed) has to 512. So it turns out that since the edges have the ratio 8:1, as 16 has to 2, and taking middles conjoined through an 8:1 ratio, it will also be the case that two middle terms fall between the extremes.[132] But if a fifth proportional term is included, the sides will no longer be in the ratio 8:1 but rather 16:1, and on account of this there will be three proportional middle terms between two cubes.[133] Therefore, what Plato says is true with respect to specified method.

36

Perhaps the word **harmonize** is used in the fullest sense and it is necessary to say that while there might be just one middle term between

12. As above, the number can be discovered by taking two sides of the closer extreme and one side from the further extreme (i.e. 2 × 2 × 3). Similarly, there is one number that stands in the 2:3 ratio to the other extreme, 18. Naturally, its factors are 3 × 3 × 2 by the same method.

131 Cf. 35.2 above.

132 The series of cubes that Proclus gives – 2^3, 4^3, 8^3, 16^3 – are equivalent to 8, 8^2, 8^3, 8^4. Of course, 8^2:8 = 8:1 and 8^3:8^2 = 8:1 and so on. If we wish to establish a continuous geometric proportion in the ratio 8:1 between 8 and 8^4, there must be two middle terms.

133 By a 'proportional term' I assume Proclus means to continue the series by doubling the roots: 2, 4, 8, 16, 32. Now the ratio between the cube roots of the extreme terms is 16 to 1. However, 32^3 is equal to 8^5, so the 8:1 ratio can find three intermediate terms: 8^2, 8^3, 8^4.

two cubes, nonetheless this middle term cannot be in accordance with a harmonic ratio. So, when the bonding between the extreme terms really (*ontôs*) takes place through these middle terms, it is wholly requisite that there be two middles. It is clear from these considerations that from a mathematical perspective (*mathêmatikôs*) it is the case that a single middle term is required between two similar planes and two middles are needed between similar solids, the latter never being conjoined by a single middle term.

2. *Physical exposition*

Having started from these [mathematical] observations, let us see how the physical conceptions (*dianoêma*) are consistent with them and bring the strictly scientific (*epistêmonikos*) account into harmony with the probable [reasoning about the physical].[134] Let us first ask what the plane is in physical terms and how it is that between planes there is a single middle while between solids there are two middles.

a. Iamblichus' view

The divine Iamblichus[135] – it was principally this man who devoted himself to the subject, while all others were as men in a dream and wallowed about only in the mathematical sense of these words – seems to me to distinguish the simple things from the composite ones and the parts from the wholes and, to put it simply, he distinguished the enmattered powers and enmattered forms from the substances completed (*sumplêroun*) by their presence. The former he called 'planes', but the other 'solids'. For just as the plane is the extreme limit of mathematical body, so surely **37** the enmattered form and the power of <physical> bodies are the shape (*morphê*) and limit (*peras*) of the underlying subject (*hypokeimenon*). As a consequence of these distinctions [we may conclude that] in the case of the simple things one middle term is sufficient because, although there is principle of Difference in the rational forming principles (*logoi*) and in the forms and, indeed, Life, [yet] in virtue of their common bonds of the rational forming principles and the forms and Life [only] one mean arises. Therefore power is uniformly woven together with power and quality with quality by reason of the actual principles of Difference and Sameness of forms. In the case of composite things, however, there are,

[134] For Proclus on scientific knowledge and the likely (*to eikos*) see I. 339.15 ff.

[135] 36.24–37.3 = Iamblichus *in Tim*. fr. 48 (Dillon). I follow Dillon's translation closely and adopt his emendations to the text. This includes adding <φυσκικῶν> before σωμάτων with Kroll at 37.2 and reading διότι <εἰ> τῶν λόγων κτλ at 37.4.

as one might expect, two middle terms, for the Dyad is the thing that supplies (*chorêgos*) both composition and division to all things. But each of the composites is composed from a multiplicity of essences and powers, wherefore the means must be multiple and are double at the least. For the middle with respect to the form is one thing, but the middle with respect to the subject another.

b. Proclus' view

But since we are concerned with *physical* principles, let us say something like this – taking our lead from the premises that Plato will provide as he goes on. We ought instead to work out what needs to be said [about such matters] from a higher vantage point.

Some of those who provide physical theories grant a *single quality* to each of the elements: they give to fire heat, but to air coolness, to water dampness, but to earth dryness. These theorists entirely stray from the truth. First, because they destroy the possibility of an orderly cosmos. For on the assumption that the elements have entirely contrary powers, then unless there were something common between them, it would be impossible for them to be harmonized with one another.[136] Second, the people who give this kind of theory make the things that are most contrary right next to one another – the hot (fire) to the cold (air) and the wet (water) to the dry (earth). But it is necessary to make things that conflict further away than things that are less alien to one another. For such is the nature of opposites. In the third place, the first two elements will in no way have sympathy with remaining two, but will be separated from one another. For what there is in common between dampness and coldness it is not possible to say. And besides all this, since the elements are solids, they will not be conjoined to one another through any sort of middle term. But it has been shown that it is not possible for one solid to be conjoined to another through a *single* term, let alone through none! Unless, of course, they were immediately conjoined (*amesôs*). But this immediate conjunction is allotted only to unextended things.

38 But other people, such as Occelus[137] who was a predecessor of Timaeus, apportion *two* qualities or powers to each of the elements –

[136] Cf. Aristotle *GC* 330a30–3.

[137] Iamblichus' list of Pythagoreans (*V.Pyth.* 36) includes Occelus of Lucania. The work to which Proclus refers, however, is a forgery of the Hellenistic period. Estimates for the date of *On Nature* range from 200 to 150 BC. Its content is strongly Peripatetic. See Harder (1926) for the text and Thesleff (1961) for further arguments on the date of the work. An English translation is provided in Guthrie (1987). One might speculate that Occelus' work provides Proclus with an opportunity to criticize Aristotle's theory

assigning hot and dry to fire; hot and wet to air; wet and cold to water; and cold and dry to earth. And all these things were written by this man in his book *On Nature*. But how can those who say these things strike a false note?

First, since they have proposed to discover the common powers among the elements in order to preserve their status as things that are coordinate with one another, they no more give them association than separation, but rather they have in equal measure preached their conflict and harmony.[138] But what sort of cosmos will there be from this? What sort of order will they have, since they are both most alien to one another and not coordinated and at the same time most akin to one another and arranged together? For they are in equal measure at war and at peace, and both establish and dissolve communion in equal fashion. But if this communion is similarly destroyed and implanted, the universe will no more be than not be.

Second, the people who uphold this kind of theory gave the greatest contrariety, not to the extreme terms, but to the penultimate ones before the extremes.[139] And yet we see everywhere that with respect to the class of homogeneous things, the ones that have been placed furthest away [from one another] have the nature of contraries, not the ones that are less distant. Therefore earth is more opposed to fire than to water since it has been placed further from fire but is less separated from water. But how has nature arranged their seats furthest from one another? Was it not by beholding their contrariety and seeing that the third is more closely related to the first than the final one? And how about their respective motions? Is it not the case that fire is the lightest and moves upwards, while earth is heaviest and moves downward? But where would these most contrary motions come from if not from nature? And surely if the most contrary motions have been apportioned to them it is obvious that the elements are most contrary to one another. For since the motions of simple things are simple and since the things that have simple motions are themselves simple, it follows

of the elements under another name. However, Proclus is not shy about disagreeing with Aristotle. He replies to Aristotle's criticisms of the Platonic theory of the elements (*Cael*. 305a33–307b26) in his 'Inquiry into the objections of Aristotle to Plato's *Timaeus*' (*in Tim*. II. 279.3). Fragments of this work are preserved in Simplicius' *in Cael*., *in Phys*., and in Philoponus' *contra Proclum*.

138 An *ouden . . . mallon* argument. Since the two-power theory gives each element only two powers, elements that are proximate to one another will have one common power and one opposed power. They will thus be no more harmonized than they are opposed.

139 See Introduction, page 17.

that the things that have the most contrary motions are themselves most contrary.[140]

And for this reason one might well be astonished that Aristotle says
39 in his work *On Motion* that earth is most opposed to fire, but in *On Powers*[141] he makes the elements most remote from one another (which possess the motions that are diametrically opposite) more akin than the proximate and similar elements. For as they have contrary places among
5 the range of positions, so they have contrary motions among the range of movements, and so they have contrary powers among the range of forms (that is, heaviness and lightness on account of which they have the contrary motions just mentioned); so too in this way they will also have contrary passive qualities. Aristotle also makes it clear that earth is contrary to fire, for, since he also wishes to show how it is that it
10 necessary for there to be more than a single kind of body, he says something like the following: 'but if there is earth it is also necessary that there should be fire since if one of a pair of opposites exists by nature the other also exists by nature'.[142] So it turns out that Aristotle was not able to show that the elements are many in any other way than by saying that fire is contrary to earth. But once again, since these things
15 are solids, how would they be conjoined through just one middle term? For this is impossible in the case of solids as we said earlier [II. 34.18]. Therefore, those who say these things arrange matters neither mathematically nor physically, but are mistaken with respect to both, and for good reason, for the physical beings are images of mathematical ones.

20 Surely then only Timaeus and anyone who correctly follows his teaching assigns not one or two powers to the elements but *three*.[143]

[140] Aristotle assigns simple motions to the simple bodies (*Cael.* 268b27–269a4). Proclus here goes on to deduce the contrariety of simple bodies from the contrariety of their motions. Aristotle himself is much more ambivalent about relations of contrariety among the elements.

[141] As Festugière notes, the references to Aristotle are a bit of a mystery. *On Motion* or *hoi peri kinêseôs logoi* seems to be Aristotle's way of referring to *Physics* 4–8 (cf. *Mete.* 338a20). But we don't find any firm assertion in *Physics* that fire and earth are opposed – just casual remarks like 214b13. Something like this view may be implied by the argument at *Cael.* 269a9, ff. The text that comes closest to declaring earth and fire to be contraries is *GC* 330b30–331a6. But even then Aristotle goes on to point out that *all* the elements are opposed to one another in *some* degree, since each will possess at least one quality contrary to that of all the others. We have no record of a work called *On Powers* (*hoi peri dynamôn logoi*).

[142] As Festugière notes, this exact text is not to be found in any of the works of Aristotle that we possess. He suggests that perhaps Proclus paraphrases *GC* 330a4–8.

[143] Proclus goes well beyond anything that Plato actually says in the *Timaeus*. However there is considerable warrant for his assigment of powers in 56a. Plato notes that fire is

Fire	tenuousness	sharpness	easy mobility
Air	tenuousness	bluntness	easy mobility
Water	density	bluntness	easy mobility
Earth	density	bluntness	immobility

[The powers are assigned this way] in order that each element may have two powers in common with what is alongside it, but one difference, which it derives from the other of the two extremes, just as was shown in the case of mathematical [solids] (31.27).

It is also assigned this way in order that earth may be arranged in an opposite manner to fire with respect to all its powers, and so that the extreme terms (fire and earth) have two middle terms and so do the ones that are next to one another (i.e. air and water). The middles in the first case are solids themselves (i.e. the air and water are middle terms between fire and earth), but in the second case the middle terms are the powers that air and water have in common (i.e. bluntness and easy mobility). Suppose fire is tenuous, sharp and easily moved, since the substrate (*ousia*) it has is sharp and tenuous in as much as it has a pyramid shape and in virtue of this shape it is such as to be bold and incisive, and also to slip through all the other elements.[144] And it is easily moved since it is both nearest to the heavens and in them, for the heavenly fire itself is the kind of thing that moves swiftly and the fire beneath the moon is sempiternally moved along with it in one circle with a single impulse.[145] Therefore, since earth is the contrary to fire, they will have

more readily moved than the other elements and that it is such as to cut things because of the sharpness of its pyramidal shape. It ranks first in fineness or tenuousness and for this reason has permeated (*dielêlythe*) all things (58b).

144 Proclus does not actually describe fire as having the figure of the pyramid, but says only σχῆμα τοιοῦτον ἔχον 'having such a figure'. But his subsequent use of τμητικόν clearly alludes to *Tim.* 56a. By this point in the dialogue, Plato has assigned the elements to their regular solids. He then explains some of the characteristics of fire by appeal to its pyramidal shape in a way that is similar to Proclus' account.

145 Cf. *in Tim.* III. 111.4–112.19 and super- and sub-lunary fire. Aristotle attributed the heat of the heavenly bodies to the presence of a fiery belt just under the moon (*Cael.* 2.7, 289a30–5; *Mete.* 1.3, 340b3, ff.; 1.7, 34a8–33) and that it, like heavens, moved in a circle. One of the problems that arises with respect to Aristotle's belt of fiery stuff beneath the moon is its motion. If it is a form of fire and if it moves in a circle, then it appears that fire has not one but two natural motions.

It seems possible that Proclus has the fiery belt in mind here since the sublunary fire in, say, a candle is moved upwards, not in a circle. Two speculative comments: first, the Aristotelian astronomer Xenarchus (first century AD) held a view similar to the one that Proclus develops. He believes that only the circular motion of fire is really natural. Its upward motion here is a result of its not having the full existence it has in the heavens where it is – here below it is only becoming fire (ap. Simplic. *in Cael.* 21.33–22.17).

the contrary powers: density, bluntness and immobility. And surely we see all these things manifested in earth. Since things of this sort are in conflict and, moreover, are solids, and specifically are similar solids, their sides – which is to say their 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, for the sides are the powers of the areas determined by the sides.[146]

Therefore, since fire and earth are similar bodies and similar solids, two proportional middle terms will fall between them and each of these middles [will be a solid] having two sides from the extreme term closer to it and one side from the remaining one. So since fire will have three physical sides – that is, the three powers: tenuousness, sharpness and easy mobility – then taking away the middle term, sharpness, and substituting bluntness will make air. Air has two sides from fire, but a single one from air or [we may also say] it has two *powers* from fire, but a single power from earth. So it also turns out that it is fitting that air has more association with what is near it rather than what is the third from it in terms of distance or separation.

Once again, since earth has three physical sides which are contraries to the powers of fire – density, bluntness and immobility – then by taking away immobility and replacing it with ease of mobility, water will be produced. Since water has density, bluntness and ease of mobility, it has two sides or powers in common with earth, but takes only one from fire. So surely in this way these middle terms and the elements will be innately conjoined, communing through two powers, requiring two means for the sake of likeness, but differing in one. And in this fashion each one will always be conjoined to a greater degree with the one that is closer to it than it is with the one that is further away from it. And a single cosmos

Proclus goes further in this general direction, insisting that there is no natural place for fire in the sublunary and that the fire here is an effluxion (*aporroia*) of celestial fire and could really be called the summit or highest form (*akra*) of air (*in Tim*. III. 111.23). Second, it is intriguing that Proclus speaks of a single impulse (*hormê*) by which the sublunary fire is moved in a circle. One of the terms that John Philoponus uses for 'impetus' is *hormê*. He supposes that the fire belt has its circular motion because of a force impressed in it by the rotation of the spheres of aether (*in Phys*. 198.12–16, 384.11–385.11). See Sorabji (1987), 7–13.

146 Proclus here relies on the fact that '*dynamis*' also has a mathematical sense in which it can mean 'root'. Though it is typically square root, it can also be that the sides of the cubic numbers are its powers: cf. LSJ s.v. *dynamai* II.4.

will result through all the elements and a single harmonic order from the dominance of proportion.

It is like this too in the case of the middle terms between two cubes like 8 and 27. 12 (which is the middle term that is alongside 8) will have two sides from 8 but only one from 27, for 12 is $2 \times 2 \times 3$. But it is the other way around with 18. Since it is $3 \times 3 \times 2$, it has two sides from 27 (the two 3s) but one side from 8 – that is, the 2. Plato's beliefs about the physical nature of the elements of the universe are thus in concord with mathematics.

3. Lexis

Having distinguished these things by such considerations, let us apply them to Plato's words from the point of view of physics. Therefore let us call the unit that has only two powers a plane, as some have done, but let us call what has three powers a solid. And let us say that if we were to construct bodies from two powers, a single middle term would conjoin the elements to one another, but since there are three powers, as we said, they are bound together by two middle terms. For there are two common powers between the adjacent elements, but a single differentia. And even the extreme terms themselves, if they were constructed out of two powers, would be conjoined through a single middle term. For let it be the case, if you like, that fire is only tenuous and easily moved and let earth have the contraries of these qualities, density and immobility. Now for these things it is sufficient for the existence of a middle term if there is only one entity. For either one which combines density together with ease of movement or one which combines tenuousness together with difficulty of movement would be all that is needed to bind the two of these elements. But since each of the elements is [characterized by] triple [powers], it is necessary for the extreme terms to have two middles and these are bound to the adjacent terms through two powers. **For solids** – that is, those things which have three powers contrary to one another – **are never brought into harmony by a single middle term.** (32b3)

42

G. Views about the fifth element

Thus the god put water and air between fire and earth and made them proportional to one another in so far as this was possible, so that as fire is to air, so air is to water and as air is to water, so water is to earth, and he bound them together and assembled the visible and tangible universe. (32b4–8)

Some of the Platonists, having been repelled by the writings of Aristotle, extend throughout the universe a single passive matter (*pathêtê hylê*) underlying the elements, granting nothing different to the heavens. This they do in the belief that this is the view that Plato urges, and they banish the tradition of the fifth element, dismissing it as a barbarian teaching. They explain that Aristotle followed these [teachings] when he introduced the fifth element. And in a certain way he hints at their origin since he appeals to the observations of the barbarians as evidence of the eternal motion of the aether's own substance.[147]

But others have said that the heavens are composed of another substance, since it also has a different form of life, as well as a more simple movement and more everlasting nature,[148] but that Plato is now surely discussing the sublunary elements and it is *these* elements that he adorns by proportion. These people speak correctly both with respect to the things themselves and also with respect to Plato's teachings – there *is* a difference between the celestial nature and the changeable and genuinely enmattered things – but they do overlook our view and the words of Plato where the philosopher says that he bound together and assembled the universe through the proportion of the four elements, and again later that the Demiurge **made the greatest part** of the stars **from fire** (40a2).

43 Let us therefore carry on, if you please, and while preserving both of these claims – that the whole cosmos is composed out of the four elements and yet the heavens have a different essence – consider how the words presently before us show this and distinguish these two in the first place. For it is necessary that either:

1. The heavens are composed of a fifth element entirely different from the four elements, as some say, or
2. They are made of [all of] the four elements, or
3. They are made of some particular one of the four elements, or
4. They are made from more than one.

[147] For Aristotle's references to Asian astronomical observations, Festugière cites *Cael.* 270b6–24; *Mete.* 339b17, ff. Cf. Rose, fr. 6 = Diogenes Laertius 1.8.

[148] The comparative form *aïdiôteron* for 'more everlasting' is seemingly incoherent. Aristotle uses it at *Cael.* 284a17 to mean that a force that moved the heavens would have to be even greater to the extent that what such a force would move is everlasting. Proclus seems to use the comparative form as a genuine comparative. Here, however, the idea of something being 'more everlasting' is attributed to others. At II. 283.19, it seems to be used rhetorically: 'What could be more everlasting than this?' Alas, III. 164.14 seems to be seriously intended and thus seriously confused.

If they are composed of the four elements either (2a) they have the same form as the sublunary elements or (2b) they have a different form. But if (1) the heavens are composed of something other than the four elements, how is it that Plato says that the whole cosmos is from the four? And if (3) it is made from one of the four, how can he say a bit later (40a2) that the stars are *for the most part* fire? And if (4) it is composed of more than one [but not all], how will the divine body not be imperfect or incomplete by not having all things while even the Earth and generally the things below the moon do have all the elements? But on the other hand, if (2) it is composed of all of them, how will the composite from them that exists there above be indissoluble while composites of the four elements here below are subject to dissolution? For it will not be indissoluble because the four elements in the heavens have equal dominion, since if there were equal dominion, where would the diversity [seen in the heavens] come from?[149] Moreover, if there were equal dominion among the elements, how is that Plato says that up there things are for the most part fire? And if it is composed out of others, how is it that, though they [i.e. the stars] are composite they are moved with a simple motion?[150] And where will 'the wholenesses' (*holotês*)[151] of the things that have been intermingled up there be?

The nature of the problem cases being such as this, the better option is to say that the whole heaven is composed predominantly of fire, but it includes in a preparatory way (*kat' aitian*) the powers of the other elements – for instance, the solidity and stability of earth; the adhesive and unifying quality of water; the tenuousness and transparency of air – and just as the earth encompasses everything in a terrestrial fashion, so too the heavens encompass everything in a fiery way. As a result, the one dominant [element] includes the others within itself in a preparatory way. One should consider that the fire there is not the same as the fire here below the moon, but rather up there is divine fire which is an imitation of intellectual fire that has been woven together with life. The fire down here, however, is genuinely enmattered and generated and destructible. So the pure fire is in the heavens and up there fire exists as a whole.[152] But **44**

[149] Perhaps Proclus is playing on the sense of ποικιλία, evoking the passage in *Rep.* 529c where Plato refers to the stars in these terms: ταῦτα μὲν τὰ ἐν τῷ οὐρανῷ ποικίλματα, ἐπείπερ ἐν ὁρατῷ πεποίκιλται.

[150] Proclus asserts at II.38.31 the bi-conditional that a thing's motion is simple if and only if it is simple, as does Aristotle, *Cael.* 268b28–69a2.

[151] See below 44.7 and n. 151.

[152] 44.1: καὶ ἐκεῖ τὸ ὅλον πῦρ. See Festugière 72, n.3. Proclus distinguishes three modes of existence for each predicate in *ET* 65: in a preliminary way (*kat' aitian*); in a way that involves being (*kath' hyparxin*); and by participation (*kata methexin*). These modes correspond to the distinction between an unparticipated form, the participated form,

earth is up there in a preparatory way (*kat' aitian*), being another form of earth such as would be expected if it is connascent with the divine fire, having only abstract solidity (*auto to stereon*) as fire has luminosity [alone]. And as the [celestial] fire does not burn, so the earth there is not dense – it is the highest kind of each. As the fire there is pure and really real, so too here below is the really real earth and the wholeness of earth, but the fire here is enmattered and exists through participation (*kata methexin*) just as the earth is up there in a preliminary way (*prôtôs*). The other one is present in each in an appropriate way – where the pinnacle or highest kind of earth is, there is the sediment of fire.[153] The moon is also an indication, having a solid and dark quality, and blocking out the light (for it is in earth's nature only to block out) and the stars which stand in the way of our attempts to see beyond, as if making a shadow above themselves. And it is clear that as these two are there on high – fire and earth – the things that are intermediate between them must also be there: the primarily (*prôtôs*) transparent (that is, air, like the brightest kind down here) and water (like the lightest of vapours down here or something still more pure) in order that all things should be in all, but each in an appropriate fashion. For it is on account of this that we characterize fire by its visibility which is the defining property of every kind of fire, and this is reasonable; for as earth is primarily tangible, so fire is primarily visible because it needs none of the other elements in order to be seen (as do the others, which need fire to illuminate them in order to be seen), but it comes to be visible in and of itself, and this is the common property of all fire. So the problem under investigation is solved.

and the quality in the participant. The unparticipated form or the monad of a series is F in as much as it is the cause of all that is subsequently F in any way. The participated form is universal common to all the instances and it is F in a way that does not depend upon its participation. Participants are F only by virtue of participating in this second form.

Festugière believes that Proclus' *Timaeus* commentary puts the same points in somewhat different vocabulary: *kat' aitian* = 'existing primarily' (*prôtôs*), while *kath hyparxin* = 'as a whole' (*kath' holotês*). The shift in vocabulary would be natural since the mode of being *kath' hyparxin* is correlated with 'the whole of parts' (*holon ek tôn merôn*), as well as with the status or order of 'participated things' (*metexomena*), cf. *ET* 67.

153 For *hypostathmê* used in the sense of sediment or dregs of the elements, cf. II. 46.28; *Phdo* 106e. The logic of argument requires that ὅπου μὲν . . . ὅπου δὲ . . . refer not to different locations but to the same one. For similar uses of this construction in Proclus in contexts where location is less relevant, but which nonetheless involve the "distribution" of all in all appropriately, cf. *ET* 103.3, 159.6.

1. The procession of the elements and their gradations

a. General remarks

In order that the entire procession of the elements and the question of how many lower forms they have may become sufficiently clear to us, we must resume the consideration of them in the order of their descent (*anôthen*). Now, these four elements – fire, air, water and earth – exist primarily (*prôtôs*) in the Demiurge of wholes [and are there] in a preliminary way and in a unitary manner (*kat' aitian kai henoeidôs*). For all the causes are antecedently comprehended (*prolambanein*) in him in the manner of a single aggregate – the *power* of fire at its acme, intellective, divine, immaculate; the *causal* force of air which is connective and life-giving; the fecund *existence* of water which rises into bloom, and the stable, steadfast, unchanging, unswerving *form* of earth. Therefore, since he knows these things, the Theologian[154] says concerning the Demiurge:

> His body burns as *fire*, unmoved and vast;
> Those godly shoulders, breast, and back – the *air*.
> Of *water* is his waist, the Ocean's share;
> And, roots beneath the *Earth*, his feet stand fast.

From these demiurgic causes a procession of the four elements into the universe comes about – though not *im*mediately (*euthus*) into the cosmos below the moon. For how will the things that are most immaterial cause the existence of that which is most enmattered in a way that involves no *median* (*amesôs*)? And how will things that are unmoved cause the existence of things that are moved in every way? For the procession of objects is never without middle terms, but rather takes place according to a properly ordered decline, and generation is accomplished through terms that are next to one another – just as is the case with the elements themselves: after fire we do not find water, which has less in common with it, but rather air. Nor is earth next to air itself, but rather water is. This is so in order that the procession down to the last things may come about through appropriate and related steps that produce the smallest possible changes for the worst (*parallaxis*). How then is it that the generation of the intellectual, demiurgic and whole elements will bring into being these enmattered, scattered and dark things? For these things are able to be done by the younger gods, and especially in as much as their composition is tangible. But the Demiurge is the father of greater and finer things.

[154] *Orph. fr.* (Kern) 168, ll. 22, 24, 28–9.

Now since the elements in the Demiurge himself are intellects and intellectual and unparticipated powers, what will be the initial procession from them? It is obvious that, while remaining intellectual powers, they will be participated in by the encosmic elements. For the procession is **46** from unparticipated intellect by proximate stages to the participated, and in general [procession takes place] correctly from unparticipated causes to participated ones and from hypercosmic forms to things within the cosmos. What then are these things which even as they remain intellectual, are yet participated? And what will be the degrees of the decline? To be sure they will no longer be intellectual things – I call 'intellectual' those things that are forms of intellect or of genuine intellectual substance – but at the same time participated. And not being intellectual it is obvious that they will not be immovable. And not being immovable, they will be self-moved. For these things immediately devolve from immobile things, and the procession goes from what is intellectual in essence to what is so in respect of participation, and from what is immovable to things that move themselves. Therefore by their self-motion these participated intellectual elements will have their essence in life.[155]

And it is clear I suppose what will proceed from this. For the descent is from life (*zoê*) to being alive (*zên*) – for this is next to life – and from what is self-moving in essence to what is self-moving through participation in life. And in so far as they have gone from life to being alive, they have been transformed, but in so far as they go from 'the immaterial' to 'immaterial things'[156] – I mean these things are immaterial in relation to the matter that is subject to change – and from divine life to divine being (*ousia*), they are assimilated to the substances prior to them. Hence taking away the former immaterial and unchangeable [nature], you will make what is changeable and enmattered. And by this they have been diminished in relation to the things prior to them, though with respect to the order and symmetry of the motions and with respect to the unchangeable [features] among changeable things, [these diminished elements] have been assimilated to the things prior to them. So if you were to take away this order and see the great discord and instability of the elements, you will have the last of all things [in the procession] and those things that have as their lot the extreme of separation, and are the sediment of all that has gone before them.

[155] I follow Festugière in reading <τῷ> in the lacuna at 46.11: ἔσται οὖν ἐν ζωῇ τὰ στοιχεῖα ταῦτα νοερὰ κατὰ μέθεξιν <τῷ> αὐτοκινήτῳ. Additionally I supplement the translation, as he has done, by reference to the subsequent τὰ δὲ αὐτοκίνητα καὶ ἐν ζωαῖς ἔχοντα τὸ εἶναι at 46.30. Proclus distinguishes between a thing having its being in life and its actually being a living thing.

[156] Reading ἀπὸ <τοῦ> ἀύλου ἐπὶ τὰ ἄυλα at 46.17 with M and Festugière.

Therefore, to sum up the [grades of] the elements

1. Some are immovable, unparticipated, intellectual and creative.
2. Some are intellectual in essence and immobile, but participated by the encosmic elements.
3. Some are self-moving and have their being in life.
4. Some are self-moving but are things that live and do not merely have their being in life.[157]
5. Some are moved by something else, but moved in an orderly fashion.
6. Some are disorderly, turbulent and have been mixed up.

47

Such being the differences, what makes it necessary to complicate an account of the elements as things that exist in one form only (*monachôs*)? For there are as many middle terms between the Demiurge and the things in the sublunary realm as there are ways in which it is necessary for us to consider the [grades of] the elements, since the procession goes to the elements [as we find them here] through these middle terms. Therefore the elements are in the heavens, though not in the mode in which they are found in bodies which are the works of genesis (*genesiourgos*). But neither are they in the heavens in the manner in which they are in the Demiurge. Moreover, there is heavenly fire – [the fact that there is] light shows this, this being a form of fire – and also earth – else how does it come about that when the moon is illuminated a shadow is cast and the light of the sun does not pass entirely through it? [These facts show that] it is necessary for the middle terms to be in them, though different ones are more abundant in different places. For example, in some places, on account of solidity the fiery nature shines forth, as in the case of the bodies of the stars; in other places, on account of its tenuousness it escapes our notice, as in the case of the spheres that carry the stars around. (Certainly[158] it is the defining feature of all fire to be visible, but it is not essential for it to be hot or for it to be the kind of thing that rises to the top. And as for earth, all of it is solid and tangible, but it need not exhibit weight or be such as crouch below and move downward. If we take these things [i.e. visibility and tangibility] as the defining features, we will discover in the heavens both fire and earth in proportion – fire determining the essence, but the others co-existing (*synÿparchein*) [with it].)

[157] Taking οὐχὶ ζωαὶ ὄντα at 46.31 to be equivalent in meaning to the negation of ἐν ζωαῖς ἔχοντα τὸ εἶναι in the previous line.

[158] 47.16: γὰρ οὖν. The whole passage is not very coherent. ἔστιν ἄρα . . . at 47.6 summarizes the conclusion of the previous section. But 47.9 πρὸς δὲ τούτοις . . . adds an additional empirical argument which, in turn, leads to a rejoinder to a potential objection at 47.16.

To reinforce again what was said earlier,[159] it is necessary to say that the causes and the things that are productive of something in every way antecedently comprehend the powers of the things arranged and made by them, especially when they produce things according to nature.[160] For nature thus has the form of tooth, eye and hand by which it shapes the matter and not every eye is extended, but there are cases where something has the form even indivisibly. Again, the soul is one thing but it contains within itself both the divine and the irrational, and in the divine it encompasses the irrational powers in a rational manner (*logikôs*),[161] and by means of these powers it guides and orders the irrational [element] as it ought to be. And the unity of the soul has not been destroyed through possessing the different substances (*ousia*) nor has the plurality been destroyed <through the unity in it>,[162] for these things exist in one way in the superior part, but in a different way in
48 the inferior part. Now surely by the same argument the cosmos is one and many.[163] For the heavens are one thing, but realm of generation is another; and the realm of generation is arranged and ordered from the heavens. These elements then exist in the heavens but they do so *celestially* (*ourasniôs*), and they are in the soul *psychically*, and in the intellect *intellectually*, and in the Demiurge *demiurgically*. For otherwise how were [the sublunary elements] intended to be directed by emissions (*aporrhoia*) from up there if they were not up there in a different mode? Thus one also sees that among the crafts the doctor is not set over the builder, for the doctor does not antecedently comprehend the matters that pertain to building; nor is the engineer set over the cook, for the engineer does not antecedently comprehend the things that pertain to cooking. Rather it is appropriate for what antecedently comprehends the whole capacity [for something] to direct that thing. But the engineer wholly comprehends the builder, just as the doctor obviously comprehends the cook.[164] So

[159] 47.22: καὶ γὰρ αὖ καὶ ἐκεῖνο ῥητέον κτλ. The προείληφε in 47.23 harks back to προείληπται at 45.1. The common theme is the way in which causes antecedently comprehend their effects.

[160] Cf. *ET* 18 for this general principle.

[161] There is a double sense to *logikôs* here. At *ET* 195 Proclus tells us that the soul antecedently comprehends all sensible things *kat' aitian* and possesses their rational forming principles or *logoi* immaterially. Thus the *logikôs* here concerns both the manner in which the rational soul contains and what it contains – the *logoi* of the irrational aspects of soul.

[162] Diehl marks a lacuna at 47.32 and Kroll suggests <διὰ τὴν ἕνωσιν>. Cf. *in Tim*. II. 164.3 ff.

[163] Recall that the human being is a small cosmos (*in Tim*. I. 5.11). Here we infer an analogous situation in the cosmos to that found in the human soul.

[164] Proclus has in mind the idea that the good of the subordinate skill is only fully realized when it is under the direction of the superior skill. The builder may construct a perfectly

if the heavens guide the entire realm of genesis, the elements will exist primarily (*prôtôs*) in them. 15

b. The Pythagorean theory

The Pythagoreans said that the elements are seen in the heavens in two ways: in one way above the sun, but in another way after the sun.[165] For

good shed on this site, but if what is needed is a city wall and not a shed at this particular location, then there is a sense in which good produced by the builder is not optimal. In *Gorgias* 463a ff., cooking is merely a "knack" that aims at pleasure unless it is under the direction of the doctor who instructs the cook to prepare the kinds of food that are conducive to health.

165 This passage presents a curious variation on the Pythagorean order of the heavenly bodies. In context, Proclus' πρὸ ἡλίου and μετὰ ἥλιον must mean 'above the sun' and 'below the sun'. The Pythagoreans thought that there were ten heavenly bodies – a decad, naturally. They added to the normal Greek catalogue a 'counter-earth' and a central fire in addition to the sun. According to Aëtius (DK 44A16) and Alexander (*in Metaph*. 40.24) the standard ordering of these heavenly bodies was as follows.

Standard order	Element	"Chaldean order"	Element
Fixed stars	cel. earth	Fixed stars	cel. earth
Saturn	cel. water	Saturn	cel. water
Jupiter	cel. air	Jupiter	cel. air
Mars	cel. fire	Mars	cel. fire
Venus	aeth. air	Sun	aeth. fire
Mercury	aeth. water	Venus	aeth. air
Sun	aeth. fire	Mercury	aeth. water
Moon	aeth. earth	Moon	aeth. earth
Earth	terr. earth?	Earth	terr. earth?
Counter-earth		Counter-earth	

Proclus' ordering of the elements into two quartets of celestial and aetherial elements does not fit well with the standard ordering. His assignment of elements to heavenly bodies puts water (Mercury) next to fire (Sun). It does, however, fit with an alternative one that Plutarch attributes to the Pythagoreans (*De An. Proc.* 1028B). Burkert (1972), 318–19 claims that this ordering, which some call 'Chaldean', is not found prior to Archimedes, though it was fathered on the Pythagoreans. It was later widely adopted and associated with astrology. Cf. Heath (1981), 106–7. It therefore seems likely that Proclus, like Plutarch, is attributing the Chaldean order to the Pythagoreans. He goes on to criticize this view because it departs from the Platonic ordering of the heavenly bodies. But Plato seems to place Venus before Mercury and thus disagrees with both versions of the Pythagorean ordering.

It is interesting to ask where this allegedly Pythagorean theory originates. Proclus introduces this theory by stating that 'the moon is an aetherial earth'. He then confirms this not by reference to a direct quotation from a Pythagorean source but by a quotation from the Orphic literature. In fact, he has paraphrased this line earlier in the commentary when discussing *Tim*. 23e2–4. He there reports that Porphyry says that the Egyptians call the moon an aetherial earth. In that context, Porphyry is discussing

the moon is an aetherial earth. Certainly the Theologian has also stated this quite clearly:

> Another limitless Earth he resolved to make
> Which immortals laud as Selene, but mortal men the Moon
> Having many mountains, many cities, many dwellings.
> (*Orph. fr.* 91 Kern)

The Pythagoreans say that Mercury is aetherial water, while Venus is air and the Sun is fire. Moreover, Mars is heavenly fire, but Jupiter is heavenly air and Saturn heavenly water, while the fixed stars are heavenly earth. And having thus divided these things, they everywhere make fire and earth the extreme terms, but connected through the middle terms – that is, through Venus and Mercury, [they connect] the aetherial [planets], for they both have a power of bringing together and making things one. But the celestial bodies are connected through Saturn and Jupiter, for the holding together of wholes and the symmetry in all things is brought about through them. And we say that these views are in accord with the traditional accounts given by many.

As you will surely recall, it is obvious that the heavenly bodies have not **49** been placed according to the Platonic manner of distribution. For Plato arranges the sun immediately above the moon, then Venus and after this Mercury (*Tim.* 38d). Whatever the case may be (*d' oun*) it is necessary to conceive that all [the elements] are also present in each sphere since in the case of the sublunary elements as well, each one participates in the other ones – even so far as fire participating in earth. Since it is easily moved, it would have quickly gone out of existence if it had had no share at all of stability. And earth participates in fire. Since it is moved

the assignment of numbers to souls and souls to heavenly bodies. In this respect, it is similar to the passage from Plutarch in which the "Pythagoreans" assign different numbers to the heavenly bodies. The sun seems to be moved to a position seventh from the central fire (rather than seventh from the fixed stars) in order that we should have this sequence: 1 (central fire), 3 (Counter-earth), 9 (Earth), 27 (Moon), 81 (Mercury), 243 (Venus), 729 (Sun). In such a series, the seventh member is always both a square and a cube number, a result likely known to Proclus (cf. [Iamblichus], *Theol. Arith.* 54.13–55.1). The neat and tidy pattern would have the Sun as a number that is both square and cube, while the other heavenly bodies correspond to numbers in the sequence that are cubes but not also squares. But alas it doesn't work that way. Jupiter (6,561) and the fixed stars (19,683) are also the squares of 81 and 243 respectively.

It seems to me not unreasonable to suppose that there were plenty of Neopythagorean variations on these themes that tried to capture the "right" numerical relations between the heavenly bodies. This might go some way to explain Proclus' (rather defensive?) remark at 48.31: καὶ ταῦτά φαμεν κατὰ τὴν παραδοθεῖσαν ὑπὸ πολλῶν ἱστορίαν.

with difficulty, it is in need of heat to rekindle and rouse it up[166] again. Now when things are thus even *here* among the sublunary elements, how could it not be even more so up *there*, where all things are present in each sphere? (Even if some participate to a greater degree in fire, while others participate more in air, others in water and others in earth.)

c. Summary of the view on the fifth element

Once more let us sum up from the beginning and affirm that the elements exist in one way as unmixed objects of thought, but in another way as things that have been intermingled. The primary mixture of them which creates the heavens has all things in a fiery fashion and in it are the highest forms of all things. But the secondary mixture comprises the elements as they are found below the moon, in which case all things exist in the manner of a middle term (*mesôs*). The last mixture comprises the things below the Earth, where the sediments of all things exist: Pyriphlegethon, they say, and Acheron, Oceanus and Cocytus.[167]

It is permissible to say both that there are four unmixed elements everywhere, and also that there are five – taking, on the one hand, the whole heaven as one thing, on the other taking the elements which are encompassed within the terrestrial region as the remainder. But the five elements are said to be elements of the cosmos, surely on account of the fact that the cosmos has been constituted from them, while the four elements count as the elements of each of these [five]. For the heavens are composed out of the four and so is the realm of generation. Therefore, the heavens are a fifth *substance* (*ousia*) besides these four elements, since it is a combination from the simple elements. For in the heavens the elements are not the same [as they are here] but are rather the highest forms of them and the four elements of all things are unmixed and are bounded in relation to one another by their appropriate forms.

Furthermore, these claims are entirely consistent with what Plato says now – that the heavens are composed of the four elements that have been bound by proportion and establish the whole cosmos – and a short while later when he fashions the five regular solids (54d) and calls them 'five cosmoi' (55d) (these things give to the heavens a fifth substance and introduce (*eisagein*) the tetractys of the four elements). And these claims are attended by truth; for all the things up there are fiery because

[166] Cf. II. 45.4

[167] Cf. Plato, *Phd*. 112e ff. and Olympiodorus *in Phd*. 192.21, 202.12. For Acheron, Oceanus and Cocytus and their position under the earth in the Orphic poems, see Kern *Orph. fr*. 222 cf. 123, 125.

the heavens are a simple body. Because it is something different from the things down here and encompasses everything, the things up there are other than the genuinely enmattered things with volume down here. Therefore, we shall neither grant that all earth is heavy nor that all fire is light, but instead we may admit that perhaps the *sublunary* grades of these elements are such as this, but the earth and fire in the heavens exist in a different manner. For the solidity and stability up there are derived from earth, and so each of the spheres is not changed in its entirety.[168] But the light and the ease of movement [enjoyed by the heavenly spheres] are derived from fire; the connective capacity and transparency are due to air; and the level and smooth character is due to water. That Plato provides us with the resources for making these inferences is safely shown by what he says a little later: **the builder built it from all the [kinds of] fire, water, air and earth there are, and left no part or power of any of them out** (32c6–8).[169] For he did not say that he made [the cosmos] *simply* out of fire or simply out of water, but that he made it out of *all the fire* and all the water. Through this he indicates that there are many and different [grades] of fire in the universe, and many [grades of] water and that they have been utterly changed in respect of their substance.

Moreover, the theology of the Assyrians[170] transmits the same teachings, which are in fact divine revelations. For in these [oracles], the Demiurge is said to make the whole cosmos 'from fire, from water, earth and all-nourishing aether' (*Or. Chald.* 67). And the Creator is said to fabricate the cosmos with his own hands (*hôs autourgôn*)

> For whatever other mass of fire there was, the All he worked with his own hands, so that the world body might be fully completed and the world might be visible and not seem membrane-like (*Or. Chald.* 68)[171]

which is to say the same thing as 'in order that it should not carry only feeble and indistinct traces of the forms' since 'the membranes' signifies the indistinct or confused [gradation of] the universals (*holôn*). At any rate,

[168] 50.9 καθ' ὅλην ἑαυτὴν ἑκάστη κινεῖται τῶν σφαιρῶν. Proclus' point seems to be that the heavenly spheres do not undergo any qualitative changes in spite of their motion. The earth in them brings it about that they remain stable in this sense.

[169] The line from Plato is translated as Proclus understands it. The interpretation according to which Plato is here insisting that the Demiurge uses all the kinds of fire, etc. (and not merely the totality of available quantities of the elements, so that there is none left over) seems somewhat forced. Proclus has *apoleipôn* here, but quotes Plato's text as *hypoleipôn* in the lemma at 56.16.

[170] The *Chaldean Oracles* are meant. See Lewy (1956), 444.

[171] Trans. Majercik (1989), cf. Lewy (1956), 120.

we have said that the Oracles testify to the teachings of Plato because both present the universe as generated out of all four elements.

2. *The proportion between the elements (Tim. 31b5)*

Concerning the agreement of the philosophers[172] on such points, enough has been said, for if there is some difference with respect to the teachings of Plato, we will see it presently. But it is absolutely clear that the elements everywhere have been bound to one another by proportion. For, just as we said (II. 13.19 and 23.5), proportion imitates the divine unification and is a demiurgic bond. But while the proportion found among mathematical things has exactness and is subject to scientific knowledge, since the ratios (*logoi*) are without matter, the proportion among physical things no longer has these attributes in a similar fashion (though such proportion as is present in the things in the heavens does and it shares in a certain sort of accuracy). But the things below the moon [have this accuracy] to a lesser degree in as much as they have been twisted or distorted in matter. Once again, then, the order of the elements is made apparent and Plato quite rightly introduces conviction (*pistis*) into physical rational forming principles (*physikos logos*) from mathematical [ratios][173] – for the latter are causes and the demiurgic procession is accomplished through soul, and the generation proceeds in an appropriate manner (*oikeiôs*) through the middle terms – and as the things in the heavens are in a certain way more akin to the precise ratios, the things below the moon have an obscure sort of truth.[174] **51**

Surely it is because he knows these things that he has written **in as much as possible** (32b5), in order that you might not demand the same accuracy concerning such physical rational forming principles as one would expect in the case of mathematical ratios. For if you were to agree to examine each of the elements, you would see many things co-mingled in each. For example, air is not simply tenuous, for it also

[172] As Festugière points out, this term surely seems to refer to the *Chaldean Oracles*. However, this use of 'philosophers' to denote the *Oracles* does not seem to be repeated elsewhere in the *Timaeus* commentary and is missing from Lewy's inventory of terms by which Proclus refers to them.

[173] The passage relies on the double sense of *logos*. It means 'ratio' in the case of mathematical entities, but also the Neoplatonic notion of 'rational forming principle'. Cf. Witt (1931).

[174] The whole passage is redolent of the doubly divided line in the *Republic*. The mathematicals form a bridge between what is subject to an accurate knowing and the lesser kind of cognition that we have of sensible things (*pistis*). Notice further that the idea that the truth of these things is in proportion to their knowablity is also found in *Republic* 510a.

has a certain density, mistiness and liquid character. Neither is water simply such as to be easily moved, for the final, earthy part of it is only moved with difficulty. And in the case of fire itself, the part that is co-
25 mingled with air resembles the bluntness of air, and this happens of necessity for it is requisite to connect the highest forms of the secondary [elements] to the sediments of the primary ones.

Furthermore, we must comprehend in what manner Plato establishes the proportion. For he both begins from the middle terms and yet preserves their [hierarchical] order,[175] just as the Demiurge made
30 all things in one another, along with the preservation of their distinctions. And in this manner he calls the entire thing that has been woven together something that is bonded and a composite.[176] It is something that is bonded in as much as the unification and proportion from the
52 demiurgic cause encompasses it, but it is a composite in as much as it is something produced from up there in accordance with Being itself (*kat' autên tên ousian*). For a person may bind together that which he did not himself compose. But it is not so in the case of the Demiurge. Rather he is the father and he is the one who makes it one and he is the guardian of all of his own works.

5 Besides this, one must comprehend that in these matters Plato assumes the geometrical middle and has signified this fact (32b5) as we have said (20.25) (for to go up in the same ratio (*ana ton auton logon*) is the defining feature of geometrical proportion, and on account of this some people call this proportion (*analogia*) in the strict sense of the term).[177]
10 In fact the other proportions with causal influence seem to provide the cosmos with some more fragmentary benefits, and not the order that penetrates through all things, nor the [causal] sequence (*heirmos*), nor continuity. This is so since, even in the generation of Soul, the other proportions are assumed for the sake of the binding of the geometric ratios and are encompassed in the mean as they are in the universal geometric proportion, this alone being real proportion.[178]

[175] Proclus here anticipates 32b5–8 where Plato presents the elements as ordered in a proportion: 'so that what fire is to air, air is to water, and what air is to water, water is to earth.'

[176] For Proclus' 'something bonded' (*syndesmon*), cf. Plato's *synedêse* and for 'composite' (*systasis*), cf. Plato's *synestêsato*).

[177] Diehl 52.5–8: ὅτι τὴν γεωμετρικὴν μεσότητα ἢ ἀνα λογίαν, ὡς εἴπομεν, ἐνταῦθα παρέλαβε καὶ ἐπεσημήνατο—τὸ γὰρ ἀνὰ τὸν αὐτὸν λόγον ἐκείνης ἐστὶν ἴδιον—ὅθεν καὶ ἀναλογίαν τινὲς κυρίως ἐκείνην ἐκάλουν. Festugière seems right to insist that the punctuation is mistaken. The m-dashes are either unnecessary or the second one should follow ἐκάλουν.

[178] Festugière translates: 'puisqu'aussi bien dans la Psychogonie ces autres proportions ne sont assumées que pour conjoindre les rapports géométriques et qu'elles sont comprises

H. Lexis

1. From these . . . four in number

From these and from that which is like them and four in number,[179] **the body of the world was generated and was harmonized through proportion, having friendship as a result of these things, so that, having come together into a unity with itself, it could not be undone by anything other than the one by whom it was bound.** (32b9–c4)

That the tetrad[180] of the elements has proceeded primarily from the All-perfect Living Being – for this was [seen to be] an intelligible tetrad[181] – and that, because of this, all things exist in a fourfold manner

dans la médiété géométrique comme dans la médiété totale, dès là qu'elle seule est vraie proportion.' In English: 'since in the generation of the soul too these other properties are only taken up to bind together the geometric ratios, and [since they] are encompassed by the geometric mean as by the entire proportion, which is the only true proportion.'

This requires that we displace the word 'geometric'. I have tried to translate more literally, but it is still a puzzle what it means. I think the sense must be something like this: geometric proportion is true proportion in the sense that it preserves the same ratio between the terms. In arithmetic and harmonic proportion, the same amount and the same part respectively are preserved (cf. Introduction pp. 10–11). Thus one might think that the key concepts in each of these latter proportions is already given when we have geometric proportion. After all, the terms that stand in this proportion will also exceed one another by a certain amount and their parts (i.e. their factors) are present in them. So the relations that are preserved in the secondary proportions are already implied in the presence of a geometric middle between two terms. The geometric middle encompasses these other kinds of proportion in the same way in which the end points of the Platonic geometric progressions 1, 2, 4, 8 and 1, 3, 9, 27 encompass all the other middle terms that Plato identifies.

[179] Proclus' text of the lemma at 52.15 (ἔκ τε δὴ τούτων καὶ τοιούτων καὶ τὸν ἀριθμὸν τεττάρων τὸ τοῦ κόσμου σῶμα ἐγεννήθη) differs from that printed in Burnet (ἔκ τε δὴ τούτων τοιούτων καὶ τὸν ἀριθμὸν τεττάρων τὸ τοῦ κόσμου σῶμα ἐγεννήθη) where the first καί is omitted. Burnet's apparatus shows that the first hand of A and F (the two key witnesses for the *Timaeus*), a lesser manuscript, Y, and two indirect testimonia (Plutarch and Eusebius) do not include this first καί either. However a correcting hand of A, the manuscript P, and three indirect testimonia (one of whom is Proclus) do have this first καί. The variant seems to go back to an ancient stemma of which M is our best *exemplum* (at least in the case of the *Republic*). Proclus' deliberate modelling of 53.12 (noted by Diehl in the apparatus) is proof that at least on some points his text veered away from A. But at other points it sticks very closely to A.

[180] Cf. II. 18.14 where Proclus claims that the 'tetrad will soon be revealed'. The tetrad or the numbers 1 through 4 hold a special place in the Pythagorean tradition. Cf. Sextus Empiricus, *adv. Math*. 7. 94–5. The relevant consideration in this context is that the numbers 1, 2, 3, 4 "contain" the decad since their sum is 10.

[181] At *in Tim*. I. 432.16 ff., Proclus correlates the All-perfect Living Being with the tetrad presumably on the grounds that it contains the four kinds of intelligible living things (*Tim*. 39e). The Paradigm or All-perfect Living Being belongs to the third triad within

(*tetradikôs*) becomes clear, I think, from the preceding words. And also because generation proceeded from the monad through the dyad and triad to the tetrad. The cosmos is, as we have seen, the only one of its kind and unique [i.e. a monad]; next we discover that it is necessary that there is the visible and the tangible in it [i.e. two or the dyad]; next that since there is considerable separation between these things, some third thing is needed [in order to bring them together]; next we find out that
53 the middle term involves two forms (*dyoeides*), and thus we arrive at the tetrad. This therefore was what the Pythagorean hymn to number said as well: 'that it proceeds from the [inviolate] abyss of the Monad, until it should arrive at the sacred Tetrad' and this gives birth to the Decad which is 'the mother of all things'.[182] The father of the *Golden Verses* also glorifies the Tetrad calling it 'the fountain of ever-flowing Nature'.[183] For the cosmos was ordered (*kosmein*) by the tetrad, which proceeded from the monad and triad, and it is completed at the decad in as much as this is inclusive of all things.[184] And that through proportion the world is a single existent composed out of these things – being constituted of these elements which are of such a kind with regard to their powers

Being – the activity of Being (*Plat. Theol.* III. 52.13 ff.). The Demiurge, who first emerges at the level of Intellect, is correlated with the Decad. The relation between the Tetrad and the Decad is thus analogous to that between the Paradigm and the Demiurge: each contains all things, but the latter contains all things in a manner that is 'more divided'.

[182] The *Hymn to Number* is sometimes attributed by Proclus to the Pythagoreans (as here), sometimes to Orpheus (*in Remp.* II. 169.25). Fragments from various sources are collected in Kern, *Orph. fr.* 309–17. Proclus would be untroubled by what might seem to us a confusion between Orphic and Pythagorean sources for this wisdom, since he doubtless follows Iamblichus in thinking that Pythagorean number theology was foreshadowed in a certain fashion in Orphic writings (*VPyth.* § 28. 145.14 (Klein)) – a view also attested in the dubious *Theol. Arith.* 48.7 (de Falco). Proclus accepts that Pythagoras was well-acquainted with Orphic philosophy (III. 168.7–18). On Neopythagorean Orphica in general, see West (1983), 29.

This particular line is one of Proclus' favourite quotations. It occurs here and at I. 316.18, II. 233.23, III. 107.14 and *in Remp.* II. 169.24. Cf. Syrianus *in Metaph.* 106.14. I follow Festugière in supplying ἀκηράτου to fill out ἐκ κευθμῶνος as it does in the other quotations.

[183] *Golden Verses* 47–8, cf. Aëtius 1.3.8 (DK 58B15). It is possible that Proclus himself wrote a commentary on the *Golden Verses*. There is an Arabic manuscript that contains a commentary attributed to Iamblichus and another commentary attributed to Proclus. But it is also possible that the Proclus to whom this commentary is attributed may be Proclus Procleius of Laodicea. See Linley (1984), O' Meara (1989) appendix II, and Westerink (1987).

[184] Reading ἀποτελεῖται δεκάς for ἀποτελευτᾷ δὲ δεκάς at 53.8 with Kroll and Festugière. Festugière refers the reader to Hierocles' *Commentary on the Golden Verses* 47 (20.14 (Köhler)).

and of such a number with regard to their quantity[185] – has been made sufficiently clear by the fact that Plato does not say that the body *below the moon* came to be from the four elements, but rather he says that the body *of the universe* (32a9) came to be from them.

2. *having friendship from these things . . .*

Now the end (*telos*) of proportion is the friendship (*philia*) of the cosmos through which it is preserved by itself through itself.[186] All that partakes of the friendly seeks to preserve that to which it is friendly, but all that is alien turns away [from the object of its enmity] and does not even want it to exist at all. So that which is friendly to itself is such as to preserve itself. Now, the cosmos is friendly to itself on account of proportion and sympathy, so it preserves itself. But it is also preserved by the creation, receiving from it an 'unbreakable' protection.[187] For this reason the Theologian calls the bond that comes from the Demiurge 'mighty', as when Night is made to say to the Demiurge:

. . . when round them all a mighty bond you have strung. (*Orph. fr.* 166)[188]

Proportion[188] gives this friendship to the universe, connecting and including the powers of the elements in it.[189] But Universal Nature also

[185] 53.10–12: ἐκ τούτων τε τῶν στοιχείων καὶ τοιούτων κατὰ τὰς δυνάμεις καὶ τοσούτων κατὰ τὸ ποσόν, Festugière takes τε not as coordinate with καὶ . . . καὶ (which renders the sentence meaningless), but as coordinate with δὲ in line 9. (Note that only the recension 5 omits δὲ). On this reading the καὶ . . . καὶ clauses are in apposition with στοιχείων; cf. Smyth §2968. This awkward phrase seems intended to echo Plato's rather odd 'from these and from that which is like them and four in number' (ἔκ τε δὴ τούτων καὶ τοιούτων καὶ τὸν ἀριθμὸν τεττάρων) in the preceeding lemma.

[186] Aristotle's discussions of friendship associate it with proportion, but not quite in the way that Proclus does. In *EE* 1241b33, Aristotle claims that numerical or proportional equality generate different kinds of justice, friendship and association. An example of a friendship based on proportional equality is that between father and son. In *EN* 1163b32, Aristotle claims that in friendships between unequals, proportion equalizes the parties and preserves the friendship.

[187] Cf. *in Tim.* I. 84.3 and 157.4.

[188] West (1983, 237) translates this line and its context (frs. 165–6) as follows. Night answered:

> Catch all in infinite aither round about,
> therein the sky, the boundless earth, the sea,
> and therein all the encircling signs of heaven.
> When you have strung a firm bond round them all,
> to the aither fasten then a golden chain.

Proclus refers to these fragments frequently. Cf. I. 207.9, 314.5, 315.13, II. 24.27, 112.6, 256.20.

[189] Festugière proposes to read ταύτην δὴ <δὲ codd.> τὴν φιλίαν τῷ παντὶ δίδωσι μὲν καὶ ἡ ἀναλογία etc, on the grounds that this line in effect restates the claim at 53.13. This

gives [this friendship], engendering sympathy and the harmony of opposites. But prior to this, Soul [gives friendship], weaving a single life of the cosmos and bringing all the parts of the whole into a shared harmony. And even prior to this, Intellect [brings about cosmic friendship], creating in it order, perfection and a single connection. And even prior to the intellectual essence, the single divinity of the universe and all the gods allotted to the cosmos are originative (*prokatarchesthai*) of the unification found in it. And even prior to the many, the One Demiurge. And this greatest and most perfect bond which the father throws all around the cosmos is productive of friendship and of harmonious association between the things in it – 'the bond of Love, heavy with fire' as the *Chaldean Oracles* say.

For after he thought his works, the self-generated Paternal Intellect sowed the bond of Love, heavy with fire, into all things.

And the reason they give for this is:

In order that the All might continue to love for an unlimited time and the things woven by the intellectual light of the Father might not collapse.

And through this love, all things have been joined to one another:

With this love, the elements [or stars, *stoicheia*] of the world remain on course. (*Or. Chald.* 39)[190]

Therefore the elements – the cosmic[190] ones that is – have been bound and have friendship, and this friendship is indissoluble through an unlimited time by virtue of the will of the Father. But if, even prior to this, one were to consider the hypercosmic cause of the friendship, you would discover this too is glorified by the theologians, for the Demiurge has brought forth Aphrodite in order that her beauty might shine forth and bring order, harmony and communion to all the things within the cosmos. And he also brought forth as her attendent Eros, who makes a one from the wholes. But he has in himself the cause of Eros, for

Counsel is the first creator and Eros of many delights. (*Orph. fr.* 168, v. 9)

has some merit. More importantly, he notes that καὶ should not convey the sense of 'also' if this line is not making a new point. Proclus inserts an extra καὶ when he begins a list where additional items in the list also do what the first item in the list does. In this instance, Nature, Soul and Intellect also confer friendship upon the universe.

190 Trans. Majercik (1989). Lewy (1956, 127) argues that Proclus misconstrues this oracle for his own purposes. The word *stoicheia* here refers to the stars, not the elements. He does it in the *Republic* commentary as well (*in Remp.* II. 306.1). Lewy thinks that Olympiodorus gets it right, however (*in Phd.* 239.3 = Majercik 62).

Hence it is reasonable that he is the cause of friendship and agreement among the things he has created. And perhaps in view of this fact, Pherecydes said that Zeus had changed into Eros when about to create, for the reason that, having established the cosmos out of contraries, he brought them into agreement and friendship and implanted sameness in all things as well as unification which is distributed thoughout the whole (Pherecydes, fr. 3).[191]

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3. it could not be undone by anything . . .

On account of these factors, and also through the one who has made it, the cosmos is indissoluble.[192] For how can it be that what generates all things by its very being should be the cause of corruption for all things? Especially in view of the fact that corruption takes place either when a thing is corrupted (1) by the matter or (2) by the form or (3) by the thing that made it. And each of these, in turn, takes place in two ways. For in the case where a thing is corrupted through what made it, it is either (3a) because the creator was weak (as in the case of partial nature) or (3b) because its mind has changed (as in the case of the partial soul). But in the case where a thing is corrupted through form, either (2a) it was not well put together from the beginning or (2b) it has been dissolved through the passage of time. In cases where a thing is corrupted through matter, either (1a) it comes from within through having matter that lacks symmetry or (1b) from without by enduring some force.[193]

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[191] Translation after Kirk, Raven and Schofield (1995). Kirk, Raven and Schofield are rightly sceptical of the evidential value of Proclus' claim about Pherecydes' reasons for thinking that Zeus changed into Eros. Pherecydes was a theogonist of the sixth century BC. Porphyry's *VPyth*. 56 asserts that Pythagoras was a pupil of Pherecydes and came to care for him when he was ill. Whether or not *we* regard this as plauisble, Proclus is likely to have considered Pherecydes to hold views that were consonant with Pythagoreanism and Orphism. In any event, even Proclus concedes that Pherecydes is 'enigmatic' (*in Tim*. I. 129.16).

[192] Festugière poses the sensible question: 'Why does Proclus credit two factors in the world's indestructibility?' On the one hand, there is the innate friendship or association between the elements that make it up. This means that it preserves itself (53.19). But there is also (*kai*) the 'will of the father' (54.17).

In fact, there is a third explanation for why the cosmos is everlasting and indissoluble: the fact that there is nothing outside it (59.24–61.13). At 59.10–24 we learn that this is the material cause for its everlasting chararcter. The *philia* that the cosmos has for itself is, I believe, the formal cause. Note that the *analogia* which gives rise to the cosmos' friendship with itself is equated with *form* at 55.20.

[193] Cf. *de Aet*., argument 6.

There are thus six ways in which corruption can come about, and Plato eliminates all of these possibilities in the case of the cosmos. For the cosmos is not corrupted by its (3) maker in either of the ways considered. (3a) It cannot be on account of [any lack in] his power to put it together because the Demiurge is the best possible [maker], and weakness has neither place nor reason to exist in him, since he rules the universe with 'implacable powers' (2.7 above). (3b) Nor is it corrupted because he has changed his mind, because he does not decide one thing [at one time] and another [thing at another],[194] and moreover because to decide to destroy that which is finely and well put together belongs to what is evil, but the Demiurge is good and the universe is finely put together. It would come to much the same then for the Demiurge to decide that the universe should not exist and that the Demiurge should not himself be good. (2) Nor [is it possible that the universe be corrupted] through its form, for the cosmos has been joined together through proportion and is one and perfect. On account of its harmony, the form dominates, and through its wholeness and unity[195] it will never be discordant or divided. (1) Nor [can the universe undergo corruption] through its matter, for (1a) the proportion annuls the internal asymmetry and (1b) the uniqueness rules out any external force. Therefore the universe is in no way capable of being destroyed.

4. other than the one through whom it was bound

But then why does Plato go on and add the words '**except by the one who bound it**' (32b4)? It is obvious that in all cases the power to destroy a thing belongs to the one who binds it together, and you could assume from this that the cosmos was created [in this way] so that it has subsistence only from another cause.[196] For just as there is no destruction of it other than by the one who generated it, so too there is no creation of it other than from the one who bound it, 'binding' implying (as we have said) that it has the causal power to loose what has been bound.

[194] Cf. *de Aet.*, argument 16. It is impossible for the will of the Demiurge to change since the Demiurge is outside time.

[195] Reading ἄνωσιν with P and Festugière for the μίνωσιν found in MQ and Diehl. As Festugière points out, if the issue is the uniqueness of the universe, then the argument in case (2) doesn't seem different from the argument in case (1b). In any case, it is unclear how the reply considered here covers destruction through not being well put together or through the procession of time as separate cases. Presumably the cosmos is so well put together that the passage of time doesn't matter at all.

[196] Unlike the soul (*ET* 189), the world-body or the composite of world-body and soul is not self-constituted (*authypostatos*). As such, it is not imperishable considered in itself (*ET* 46).

But the statement has another implication too. For the universe is indestructible by everything except the one who bound it, for to him it is not indestructible – it would be for him the work of a moment. Quite the contrary though, it is bound by him through all eternity (*diaiôniôs*). Therefore it is as if Plato said that the one who has scientific knowledge is immune to mistake (*aparalogistos*) in every way except intellect, since he is not immune to mistake by intellect. But it is not enough for intellect not to lead into error: really it should make the soul wise.[197] In the same way the cosmos is not indestructible for him who bound it, but it is actually all the more bound by him on account of this. While to others it is indestructible, it belongs to him not merely to refrain from destroying, but rather to hold the cosmos together, just as it belongs to the sun to illuminate things and not merely to fail to darken them, for this latter capacity is had by other things as well. **56**

III. The third gift of the Demiurge: a whole of wholes

The composition of the world took up the entirety of each [lit. 'one whole each'] of the four elements. The builder built it from all the [kinds of] fire, water, air and earth there are, and left no part or power of any of them external to it. (32c5–8)[198]

A. Theoria

These words relate to what we said earlier (50.16) – that Plato knew that there are many different [grades of] fire and water and the other elements, out of *all* of which the cosmos has been composed. This is the third demiurgic gift to the cosmos. So we ought not to be surprised if he leaves the highest grades of the four elements in the heavens, the middle grades in the region below the moon and the final dregs in the region below the earth (49.12), distributing the elements in a manner analogous to the three demiurges, referring these to Zeus, Poseidon and Pluto respectively.[199] For in each case, the whole of them is received and the universe is [composed] out of all of each one. [This is so] whether

[197] Reading ἀλλὰ φρενοῦν with Q rather than ἀλλὰ καὶ φρενοῖ with Diehl at 56.6. I take ἀρκεῖ as an impersonal verb governing the accusative plus infinitive. It is possible to suppose that the second clause turns around and uses the indicative, in which case the sense would be 'whereas in fact what it does is make the soul wise'.

[198] Here again (cf. n. 168) the lemma is translated according to Proclus' understanding of it, though it is perhaps not the most natural interpretation of what Plato has actually written.

[199] Festugière refers us to *in Tim*. I. 74.15. The three demiurges are not named in this passage, but see *in Crat*. 148.

you speak about the first and celestial fire, or the middle [gradation of fire] or the final and discordant kind which is merely tinged with certain fiery qualities. For whatever we suppose discord and disorder to be, each of the elements below the earth surely manifests this sort of nature. This is because when creation proceeds, after a short while it tails off into that which is unordered (*to akosmêton*) and that which participates in order to the least degree. These things, then, are all cleared up.

We say that when Plato writes that the builder **left no *part* or *power* of any of them external to it** there are two different things at issue. A *part* of one of the elements is of the same sort of substance as the whole element of which it is a portion, but a *power* completes each of the elements. So, a part of [the totality of] fire is fire, but a single power is one of the many defining features of fire – the power of movement or the power of sharpness or the power of tenuousness. From these powers there results one single fire, and all the [kinds of] fire and all the powers of fire and of the other elements are included in the cosmos.[200]

1. Problem: Plato's teaching and the Chaldean Oracles

How about this? Suppose there were someone prompted by foreign theosophy who divides all things into an empyrian region, an aetherial region and a material one, and calls only the visible region 'material'.[201] [This person might ask:] 'What shall we say about firmaments (*stereômata*) *above* the world, whether it is necessary to call them Olympian or empyrian or aetherial?' Well, perhaps it will be enough to say that even if these firmaments are not made out of the four elements, it is nonetheless true that there is no part of the four elements outside (*exo*) the universe – or rather let us say **external** (*exothen*), as Plato says. For 'external' is more emphatic since it makes clear the force that

[200] Festugière notes that πᾶν πῦρ at 57.8 is intended in the same way as πυρὸς παντὸς at 50.17. Proclus is keen to argue that Plato means that the cosmos includes the total quantity of the four elements, as well as every gradation of them.

[201] The 'foreign theosophy' in question is the *Chaldean Oracles*, cf. Lewy (1956), Excursus I. The *Oracles* divide the universe into three regions, as Proclus says. The Empyrian is regarded as an intelligible realm and is physically associated with the outermost of the world circles. The Aetherial is identified with the fixed stars and the planets while the sublunary realm is called 'material'. Assigned to each of these regions are Rulers. Among other functions, these Rulers play a role in theurgic practice. Hence Proclus later calls the one assigned to the Aetherial region 'Ruler of Souls' (*psychokratôr*) and 'Ruler of Mysteries' (*teletarchês*). For more detail on this aspect of the *Oracles*, see Lewy 137–57. Proclus further integrates these Chaldean entities into his own ontology, identifying the *Teletarchês* with the third triad of the intelligible and intellectual order.

these elements would exert against the cosmos if they were not within it but acted upon it from the outside. For the elements in question are also fiery and are included within the whole cosmos. And once again it is true that none of the fire is external to the universe, but rather the universe includes as much as there is of it, whatever sort or quantity there might be,[202] and the account given by Timaeus is entirely true.

But for what reason, someone might ask, does Plato establish the universe beginning from the inerrant sphere?[203] It is because it belongs to the *physical* theorist to generate accounts of the things that are visible or, more generally, things that are apprehended by the senses. But perhaps he very reasonably brought only these things to mind since only [the visible realm] falls within the scope of Demiurgic creation. For of these firmaments, the first is zoogonic (that is, life-giving), the second relates to the Father, but the material realm is Demiurgic. As the *Oracles* say:

For the First Transcendent Fire does not enclose its own Power in matter by means of works, but by Intellect. For Intellect derived from Intellect is the Craftsman of the fiery cosmos. (*Or. Chald.* fr. 5)[204]

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Unless maybe one ought to say this [in response to the current puzzle]: that Plato has produced the Soul in proportion to the aetherial region, but the Intellect in proportion to the empyrian region. It is on account of this fact that he says that the Soul has been composed from three parts (35a6, 37a4), while the Intellect is impartible. For the aetherial region is also threefold, and the Ruler of Souls who rides upon the aetherial is Ruler of Mysteries (*Teletarchês*).[205] And the empyrian region is one and is intellectual by virtue of its substance (*ousia*), as we have had it related. But we must look into these matters afterwards, for they involve many puzzles about the manner in which they accord with the teachings of Plato.[206] For now let us pass on to the next words.

[202] Deleting the second occurrence of τὸ πᾶν in line 22: ἀλλ' ὅλον ὅσον ἐστὶ περιέχει τὸ πᾶν, οἷον <ἂν> ἢ καὶ ὅσον {τὸ πᾶν}.

[203] The unwandering or inerrant (*aplanês*) sphere is the sphere of the fixed stars, identified with the circle of the Same in the coming psychogony. Festugière points out that this aporia depends on the previous one: if there really are firmaments above the sphere of the fixed stars, why does Plato not start with them?

[204] Trans. Majercik (1989). Cf. Lewy (1956), 113.

[205] Cf. n. 200 above.

[206] The Suda attributes a work entitled 'On the agreement of Orpheus, Pythagoras and Plato with the books of the Chaldeans' to Proclus. It also attributes such a work to Syrianus. It is possible that Proclus' version is simply Syrianus' text with additional scholia. See Dodds (1963), xiv.

B. Theoria

Thinking these things through,[207] he intended first, that as a living thing it should be as whole as possible and complete, made up of complete parts. Second that it should be just one universe, in that nothing would be left over[208] from which another one just like it could be made. Third, that it should not get old and diseased. He realized that when heat or cold or anything else that possesses strong powers surrounds a created body from outside and attacks it, it destroys that body prematurely, introduces disease and old age upon it and so causes it to waste away. (32c8–33a6)

1. Exposition

Plato provides three reasons why none of the elements remains outside the universe. I sum them up as follows: its completeness (*teleiotês*), its singularity (*henotês*) and its sempiternity (*aïdiotês*). All these terms are convertible with respect to the subject.[209] If the universe is *complete*, then there is nothing external to it. (For the complete is that which has all its parts and the things that fill it out within itself.) [And the converse,] if there is nothing outside the universe, it is complete. (For that which has received all things is complete.) Next, if the cosmos is *single*, there is nothing outside of it. (If there were something outside it, another cosmos would come about – for why should it be the case that a cosmos has come about from these elements here, but one would not likewise come about from those external elements? [And the converse,] if there is nothing outside the cosmos, the cosmos is single. And in the final case, if the universe is *everlasting*, there is no body external to it homogeneous with the elements in it. If there were something, then in attacking it, [the external body] would distress and dissolve the universe – for being external, it would be alien to the cosmos; and being alien, it would trouble the universe. Moreover, if there is nothing external to

[207] Again, the lemma is translated as Proclus understands it. One would ordinarily render τάδε διανοηθείς as something like 'his intentions were as follows'. But at 61.15 Proclus will claim that Plato consciously adverts to the discursive character of the Demiurge's thinking, contrasting it with the 'simple conception' (δι' ἁπλῆς ἐπιβολῆς) which is a product of *nous* rather than *dianoia*.

[208] Proclus has ὑπολελειμμένον here and again at 62.9 while the OCT of Plato prints ὑπολελειμμένων. When Proclus reprises the lemma a second time at 62.18, he uses ὑπολελειμμένων.

[209] Proclus' argument suggests that the predicates 'is complete', 'is single', 'is perpetual' and 'is such that nothing is outside it' stand in a particular relation to the subject, the universe. One is predicable of it if and only if all the others are. Ross (1965) distinguishes six senses of 'conversion' in Aristotle's logic (ad *An. Pr.* 25a6). Proclus' use here suggests that he is thinking of the conversion of terms.

it, the cosmos is everlasting, for it will have no destructive agent (*to phthartikon*).

The true explanation[210] of the uniqueness, sempiternity and completeness of the world was earlier derived from the Paradigm.[211] For the Paradigm was all-perfect (*pantelês*), uniform (*monoeidês*) and eternal (*aiônios*). It has the second of these features on account of the One-Being, through which it is the only one of its kind (*to monogenes*).[212] It is by virtue of the Eternal that it possesses the property of being everlasting (*to aïdion*). But it is perfect or complete on account of the fact that it includes all the forms of the Intelligible Living Beings. This remaining feature is the defining feature of the All-perfect Living Being. So there is the all-perfect cause of completeness, the uniform cause of uniqueness and the eternal cause of sempiternity – since every productive cause produces an effect (*to deuteron*) similar to itself, and especially if it should create in accordance with its essence (*kat' ousian*) and if it should possess its essential activity.

But at the same time each of these [properties] is also shown to follow from these things in as much as they are material causes. For if there is nothing outside the universe, if it has gathered together all the parts that are akin to it, <it is one, if . . . >[213] it is perfect and it is everlasting.

2. *Problem: Why infer the absence of things external to the cosmos from the fact that it is everlasting?*

But someone might raise the following puzzle: how is that Plato attempts to infer that nothing has been left outside the universe from the fact that

[210] Festugière refers to I. 440.26 for another example of this sense of *hypomnêsis*.

[211] Cf. I. 441.21 ff.: 'All of the paradigms exist in monadic and eternal essences, and the superior parts of the universe imitate their causes to the highest degree and in every respect have become most like their models – in respect of their singularity (*to monadikon*), their being, and their eternity etc. . . .' The features that Forms possess qua Forms (eternity, uniqueness, perfection) can, in the highest elements of the cosmos, themselves become determining characteristics that are imitated.

[212] The One-Being (*to hen on*) refers to the subject introduced in the second hypothesis of the *Parmenides*. Proclus and Syrianus regard it as the monad of the level of Being. The Paradigm, from which we are here told that the cosmos derives its uniqueness, is the final member of a triad whose first terms are the One-Being and Eternity (*in Tim*. III. 15.11–16.1). Note that in the passage before us here, the Paradigm derives features from both of these previous terms, while it has its defining characteristic in its own possession of all the forms of living beings. These forms, of course, are four in number (*Tim*. 39e). So we are once again presented with the decad. Cf. n. 180 above. This is the first reference in Book 3 to the One-Being. In Book 1, Proclus discusses its position in the procession from the one relative to *to aei on* or 'what which always is'. Cf. I. 230.10 ff.

[213] Diehl marks a lacuna of several words here. ἕν ἐστι is supplied from the *recensio vulgata*.

it is everlasting? For there are other things that are everlasting, and yet there is something outside of *them*,[214] as, for example, in the case of the heavenly bodies.

One should say that in the case of the heavens, the other things are both outside and not outside. On the one hand, in as much as they are naturally separated from them, they are outside. But on the other, in as much as they stand in a relation of sympathy to them and are encompassed with them by a single nature because they are the most proper parts, the other things are not outside the heavens. But if there were anything *really* outside the universe, it would be outside in an isolated fashion (*monôs*), having no relation of sympathy to the cosmos but having an alien existence and would have been deprived of the life in the cosmos and cut off by the intervening void.

But surely if someone were puzzled about the psychic vehicles – how they are impassive with respect to the elements here below when they do not rule over them as do the divine bodies – we will have to reply that they would be affected by them if they were similar to the elements out of which the vehicles have been composed. But as it is, since they have been composed of other things, they remain *indissoluble* according to our hypothesis. But at the same time they are not entirely *impassive*, but as material bodies get stuck onto them, they wreck their natural motions and they are moved in an unharmonious fashion. On account of the material bodies that have stuck to them, they cannot move in a circle, but neither are they able to move in a straight line on account of their own nature. And surely it is from this that Plato calls the revolutions within us perturbed (47c1) – not only on account of the psychic movements, but also through the motions of the [psychic] vehicles, that is, such motions as arise out of the adherence of these bodies to them.

If therefore, the universe is everlasting and if it should be regarded as always in a natural state, then it is requisite that there should be nothing outside it. For since this thing would be entirely alien to the universe, then in striking against it from without, it would be a cause of its destruction (59.7 above). One would also be able to assert the converse:

[214] Proclus has argued that if there were anything external to the universe, the universe would not be perpetual. He now considers two perpetually existing things which do nonetheless have something external to them: the heavenly bodies (which at least have the things here below separate from them, if not external to them) and the vehicles of the souls' descent into bodies. His solution to the first objection is that the things here below are not outside the heavenly bodies in the same way in which something outside the cosmos would be outside of it. Festugière thinks that Proclus' response to the second problem is that the astral bodies are composed of gradations of the elements distinct from those that are here below, and though they may trouble them, their action external to these bodies cannot dissolve them.

that 'in order that the universe might be everlasting' is the conclusion, and the middle term and cause of this is that there is nothing outside the universe. For because there is nothing outside the universe, nothing is capable of introducing destruction to it as something alien. As a result, it is everlasting. While this is the cause of sempiternity to *the universe*, it is not a cause whereby the *parts* of the universe are everlasting. Rather in their case something else is the cause of indestructibility; for example, the fact of having been instituted by the one Demiurge. For to all things simpliciter, he is the cause of immortality. So it turns out that the universe is indestructible to a greater degree, since it is so through the Demiurge and also through there being nothing outside the universe. And in this way it is also possible to infer the converse propositions with respect to the other predicates too. For example, that since there is nothing outside the universe, it is one of a kind – so that the universe may be one of a kind from three reasons: on account of the Paradigm; on account of including all the matter there is; and on account of there being one Demiurge. And [in the other case] that the universe is all-perfect because it has grasped everything.

Each of these things then is clear. But in the case of the converse propositions to these (for example where the proposition is 'if the universe is one of a kind, then there is nothing outside it') once again there is the same objection as before (59.24) and it is resolved in the same way – it is assumed that the universe is one of a kind in a transcendent way, which involves the existence of no other thing.[215] But if it is perfectly complete, it has nothing outside it and [the argument] 'if the universe is complete, there will be nothing outside it' is not true in an unqualified way (*autothen*) except in the case of the universe. And if this were so, the particular demonstrations would be like this:

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1. The universe is one of a kind. If it is one of a kind, then it could have nothing outside itself out of which another such as it could come to be.
2. The universe is indissoluble. If it is indissoluble, then nothing alien to the things out of which it is made could be external to it.
3. The universe is all-perfect (*pantelês*). If it is all-perfect, then there is nothing outside it, for what is all perfect has nothing left out. For this reason Aristotle[216] also says that the universe alone is perfect

[215] The universe differs from the example of the heavenly bodies in as much as the existence of, say, one heavenly body presupposes some further things in the heavens of which it is a part.

[216] Diehl tentatively suggests *Cael.* 268a20. The general principle about perfect wholes and incomplete parts seems endorsed by the remark about the construction of the temple at *EN* 1174a25.

> or complete (*teleios*), but all the things in it are incomplete, since they are [only] *parts* of the universe.

These are the matters, as one might summarily say, about which Plato has given us an account. But if you are willing, let us carry on to consider particular words themselves.

C. Lexis

By the words '**thinking these things through**' Plato adverts to the fact that the thinking in the Demiurge is divided into moments, calling it 'discursive thought' (*dianoia* cf. *Rep*. 511d), since he takes it up discursively and not through a simple conception (*di' haplês epibolês*). The splitting of causal accounts into many parts,[217] is the function of discursive thought, but the function of intellect is to apprehend what is uniform and to grasp all things in a single act of intuitive thought. Making himself the herald of the causes antecedently comprehended within the Demiurge, Plato has ascribed his own discursive thinking to the uniform intuitive thought of the former. Surely the *Oracles* also call the divisible intellections (*meristas noêseis*) of the Demiurge discursive thought (*dianoia*) in what follows:

> After the Paternal thoughts (*dianoia*),
> I, the Soul, am situated, animating the All with my heat.
> (*Or. Chald.* 53)

But the words '**as whole as possible**' and '**complete and made of complete parts**' liken the cosmos to the wholeness (*holotês*) that is intellectual and to the totality (*pantotês*) that is intelligible. For the parts are said with reference to the whole and are not complete on their own, but have the completeness such as parts may have, while being deprived
62 of perfection or completeness in the absolute sense. But the universe is strictly said to be a whole – for the whole that exists in the manner of a whole (*holikôs*) is one thing, but the part that exists in a whole manner is another. The whole that exists partially (*merikôs*) is yet a third thing. And last of all is the part that exists in a partial way.[218] The universe is a

[217] 61.17–18: τὸ πολυσχιδὲς τῶν τῆς αἰτίας ἀπο λογισμῶν διανοίας ἔργον ἐστί. One is tempted to translate 'the calculation of causal chains'.

[218] At *in Tim*. I. 310.15 ff. this fourfold distinction is applied to creative responsibilities of the Demiurge and the subordinate partial fathers. Proclus claims to be reporting Syrianus' views on the identity of the Demiurge, but it is unclear that the vocabulary of *holikôs* and *merikôs* is his. The closest parallel outside Proclus' writings occurs in Porphyry's *Sentences* 22. The distinction certainly comes to the fore when Proclus is discussing the Demiurge's activity, cf. *Plat. Theol*. V. 42.17 ff. The only point at which

whole that exists in the manner of a whole, in as much as it is 'a whole composed out of wholes' (33a7). But each of the [heavenly] spheres is a part that exists wholly according to a secondary form of wholeness. The partial living things are wholes only partially, for a third form of wholeness is present in them, but along with the defining feature of what is partial. Finally, the parts of partial living things are parts that exist in a partial fashion, for they are only parts [and not wholes in any way at all].

The words '**in that nothing would be left over from which another one just like it might be made**' is an account of the cause in virtue of which the cosmos is unique – that is, of the material cause (59.2). For if there were anything of this sort left outside, another cosmos greater or smaller than this one might be made out of it. For the Demiurge would surely not send this extra-cosmic material forth unordered (*akosmêtos*) since he decided all things should be good and nothing bad (30a1). But if the cosmos is one in number, there is nothing such as it was generated out of left over outside it.

Perhaps Plato adds this as well because of the heavenly bodies and unique things (*ta monadika*) generally. For the heavenly spheres are unique things, there being nothing else left over outside them from which any more like them could be made. Each has been composed out of those things which, by their magnitude, power and number, are productive only of the heavenly spheres and nothing else. For this reason, they are said to be unique – because only from such things can the heavens be made and from these things only the heavens and nothing else can be made.[219] Nor is any other of the simple bodies entirely such as

the contrast is invoked in *ET* is at 158, 12–15. Here Proclus provides one meaning equivalence: each of the particular intellects discussed in 170 is all the others 'in one aspect' (*kath' hen*). This is the same thing as specifically (*merikôs*). So, 'the whole is in this sense contained in each specifically, being delimited by some specific aspect which dominates the entire content of a specific intelligence (*ET* 180, 7–8, trans. Dodds: τὸ ἄρα ὅλον οὕτως ἐστὶν ἐν ἑκάστῳ τούτων μερικῶς, καθ' ἕν τι τῶν μερικῶν ἐπικρατοῦν ἐν τοῖς πᾶσιν ἀφοριζίμενον). It is unclear whether such a relatively technical meaning can be extended to all treatments of the contrast in Proclus' *Timaeus* commentary. Cf. I. 5.19, 39.32, 79.4, 244.27, 270.29, 310.16, II. 26.27, 236.20, 239.32, III. 193.22.

[219] I cannot think of any English sentence that captures the double use of μόνος and connects Proclus' explanation to the word monadic: διὸ καὶ μοναδικὰ λέγεται, διότι ἐκ μόνων ἐκείνων μόνον συνέστηκεν (62.21–2). Why does Proclus think that unique and perpetual entities like the heavenly spheres are such that (a) nothing else could be made from the material that makes them up and (b) they can only be made from the material that makes them up? One suspects that the reasons may be something akin to those offered for the eternity of the world in *de Caelo* I. 12. If it were possible for the material from which the heavenly bodies are composed to enter into any configuration other

to be able to be the element of each of these [heavenly bodies]. And this was [in keeping with] the highmindedness of Plato: that one thing is only destroyed by what has been placed around it on the condition that what surrounds it is composed out of the same sort of stuff as the former thing is. Thus, there will be as many different sorts of fire, and each of the other elements, as there are unique things out of which the universe is composed. And the Demiurge established just as many forms of simple bodies as the number of composites he intends to introduce, in order that all of them will bring about the completion of some particular single thing and so that nothing else may be generated out of them.

The words **that it should not get old or diseased** have an obvious
63 explanation. For disease arises from the asymmetry of what is introduced – with this or that [foreign] thing assimilating itself to this or that organ and destroying the proportion between that part and the remaining parts from which we will then be composed. Through this, an excess and deficiency of the humours insinuates itself. And old age follows on the weakness of our nature when it has fought against many external things and has spent itself in contest after contest, just as Plato says (81d) in what follows. For these things are not without effort – the digestion and assimilation of nourishment, purgation, and all such natural functions. And you may further assume from these considerations that the Demiurge possesses the font of the Paeonian[220] series since he brings it about that the cosmos is free from illness and age. For it is requisite for the health that truly is to be prior to the generated kind of health, this being in a singular manner (*monôs*).***[221] Such is the case with the health of the universe. For generally if health is the cause of symmetry among the elements, it is necessary that health be present in the highest degree in the universe in which the

than that which they presently have, then in an infinite amount of time this would have occurred. So the monadic bodies are the only things that can be composed from their constitutents. Similarly, if anything else were capable of constituting another heavenly body, it too would have to be perpetual since anything of the same sort as a heavenly body must be perpetual. But if it existed perpetually and were capable of constituting another heavenly body, it would have done so. So there is nothing else that could compose any additional heavenly body. In addition, the Demiurge's goodness and excellence as a craftsman may also imply that the material that he uses for each of the heavenly bodies is "just right". That is, it is the kind of material uniquely suited to make only that which he "makes" from it. Cf. 62.12–14.

[220] From the association of paeans with healing, cf. *Iliad* 1.473. This 'series' descending from a divine source will have its terminus in the art of the doctor; cf. *in Remp*. II. 118.10, 153.26 and Olympiodorus *in Phd*. 7.4.5.

[221] Kroll marks a lacuna at line 12.

symmetry of all the elements is present to the highest degree. So it turns out that the font of this condition is primarily located in the Demiurge.

It seems that there is one kind of health that pertains to the factors that come together in the constitution of any composite (which is a sort of creative or demiurgic health). The other is a health that is restorative of an existing [constitution], whether this [constitution] is one that is already secure, or is in the process of dissolution. In the one case, where there are indissoluble bonds, the connection is preserved; but in the other case, where the bonds are soluble, it is destroyed. For the indissoluble structures require renewing (as they and their power are limited) and they are renewed from the things that have unlimited power. In the present passage, the Demiurge's providential care for the universe – a care which ensures that it may be free from disease – coincides with the composition of the universe. But the providence discussed in the *Statesman* (273e) – where the God takes the tiller of the universe again and corrects the afflictions of the previous cycle – this providence is a paradigm of the second kind of health, that of the renewing kind.

For this reason, the *theologians* (*Orph. fr.* 202, Kern) refer one kind of health to Asclepius, namely all the forms of mending what is contrary to nature – whether this mending repulses what is contrary to nature forever or only for a time. But the theologians make another sort of health prior to Asclepius. It is established together with the creation of objects **64** and they derive this health from Persuasion and Love. Because the universe arises from Intellect and Necessity, as Plato says (48a), Intellect persuades Necessity and Necessity has been reverted upon Intellect in order that it may direct all things toward what is better. It is obvious from these things that the universe possessed this health naturally from the moment of its composition by virtue of the persuasion exercised by Intellect and by the reversion (*epistrophê*) of Necessity upon Intellect. Whatever the case, the Demiurge, as is clear from this, contains the font of health – health of both the Asclepian and creative kinds. So much, then, for these issues.

The words **created body**, [in the lemma where Plato says that when heat or cold or anything else that possesses strong powers surrounds a created body, indicate the fact that] the composite is also moved by something other than itself. That which moves itself is such as to preserve itself. But in the case of that which is moved by another, it is requisite that it not be interfered with by something else moving differently, and of course the universe, in so far as it is a body, is something moved by another thing.

Furthermore, Plato has assumed **heat and cold** as examples of effective things with strong powers. The former brings about destruction through cutting things up, but the latter through violent freezing.

The word **prematurely** makes clear the asymmetry and the lack of aptitude (*anepitêdeiotês*) that results from asymmetry, and also relates to that which comes about spontaneously. For to those who leave something outside the universe, it seems fitting to entrust to chance and spontaneity the question of what things will befall bodies.[222]

It might seem that when he says that hot and cold, by **surrounding a body from outside** and **attacking** it, would make the body sick and destroy it, Plato agrees with the view that the capacity to be heated or cooled belongs to the cosmos generally.[223] For if it would not undergo anything of this sort were it surrounded by heat or cold, it would not be affected in any way by them. But he does not say that the cosmos will be affected by the things that surround it, but universally that every composite body is affected in so far as what is outside it is similar to what is *inside* it, and what it is made from. So if it were made of hot and cold, it would be affected by these things. But if it were made of other things that have strong powers, it would be affected by those. If they were opposites to the things from which the body has been composed, then because they are opposites, it would make the composite body that it attacks decay. But if, on the other hand, the body and what surrounds it were similar, it would dissolve the ratio according to which the body is composed by virtue of adhering to the similar [ingredient] within it. Since he is talking about every composite body it was reasonable that he was reminded of the case of heat and cold, since these are things that are familiar to everyone. For there exists some composite of

[222] Those who leave something outside are perhaps the Epicureans – though one might have expected Proclus to say 'those who leave something outside the cosmos' rather than *exo tou pantos*. (Or perhaps Proclus has in mind no specific view at all. Cf. *Phlb*. 28d5.) According to the Epicureans, our cosmos is one among many falling through the infinite void. It is not made by the gods for any purpose. Spontaneity is defined by Aristotle as the kind of coming to be in which there is an external cause, but it does not operate for the sake of anything (*Phys*. 197b18). In his remarks on the Epicureans at I. 262.8 ff., Proclus seems to define the spontaneous as that which altogether lacks a cause. Perhaps he has in mind the notion that the initial collisions that spark off a cosmos occur due to the swerve, cf. Lucretius 2.216–50. However the way in which the concept of spontaneity is deployed in the argument at I. 356.30 seems consonant with Aristotle's sense of the term. Proclus' successors are certainly attuned to the difference. For a sophisticated argument against the claim that the world is the product of spontaneity, see Simplicius *in Phys*. 354.1 ff.

[223] *thermantos* means capable of being heated in Aristotle, *Phys*. 224a30. Cf. Philoponus, *in DA* 477.12 for a similar exposition of *psykton*.

these things and it is familiar to all, and for this reason and in as much as these things are familiar, he has reminded us. But since it is not the case that every composite is made of these things, in what follows he has added the remaining words **and** universally **anything else that possesses strong powers**, even if they are not forms of heat or cold. For it is necessary that *all* physical bodies have physical powers in virtue of which they will be able to act according to their nature (*kata physin*). If therefore the cosmos were surrounded by a body, this body would be either like or unlike what is within the cosmos. If it is unlike what is within the cosmos, it would interfere with it. But it is necessary that what is impassive should not be interfered with by anything alien. But on the other hand, if the surrounding body were like what is within the cosmos, then by getting stuck onto what is similar within the cosmos the external body would destroy the ratio among the elements in the cosmos – this ratio of the elements from which it is composed forming 'the finest bond' (31c). So much, then, for the exegesis of the particular things said in the text.

D. Why does the Demiurge make only one cosmos?

Let us now consider this question in its own right: how is it that there is nothing outside the universe? For what particular reason did the Demiurge who established matter not craft numerous kinds of matter and numerous cosmoi?

Or we might say it is because he has established and continues to establish matter in accordance with the *henad* within himself, so that, because of this, he naturally (*eikotôs*) produces this single kind of matter.

Or because, though things have many differences by which they are distinguished from one another, nonetheless *matter* possesses no differences or qualities. For even if we were to say that there are a plurality of matters here in the universe, we would also insist that there is a single kind that proceeds from above through a process of degradation (*hyphesis*) right down to the very last sedimentary kind which is genuinely formless. The highest form of matter has many affinities with the forms, since in every case the highest forms of a thing are most akin to what is prior to them. So it turns out that there both is and is not this selfsame matter distributed through all things and subsiding into itself. By virtue of this single matter, then, the Demiurge brought forth a single cosmos that represents a lesser degree (*hyphesis*) of himself.

Or because everything that creates by its very existence (since it is one) makes a single image of itself and one whole form. And this is

66 especially the case with respect to things that remain unmoved. For in the case of what has been moved, it is able to make another and another.[224]

Moreover, [the Demiurge makes just the one world] because to divide things into a plurality is not the effect of what is powerful, but rather of what is weak. To include plurality in the one and to connect the whole number [series] through the monad is a power of amazing abundance. If therefore the whole power is in the Demiurge and if he is an unmoved cause and if he creates from just being himself, and if he engenders that which is similar to himself, then he would generate a cosmos that is one, entire and perfect.

But what about this? Is the Demiurge just not capable of ruling over many or even unlimited *cosmoi*? Or we might say it is because power is not manifested in ruling over the numerous or unlimited, but in bringing together what has been divided and limiting what is unlimited. For in doing this he likens the objects to the good, a goal toward which the Demiurge lifts up his entire creation. This point then has been demonstrated through many other arguments.

Plato establishes for us in an impressive manner that nothing has been left external to the universe from which another like it could be made. And we may learn that each of the unique bodies can only be composed from those very simple bodies from which they are in fact composed – and not out of something external but similar to these [constituents] from which another one could be made – by noticing that he says that various inequalities belong to the seeds (*sperma*) of bodies.[225] On account of these inequalities, even fire is subject to limitless differentiations. For this reason, not every instance of fire is similar to every other instance of fire, even if it is common to all fire to be visible. Because of this diversity, some fire does not burn. This [variety among the kinds of fire] is due to the smallness and size of the things from which it is composed. And the same thing is true in the case of all the elements.

Therefore each unique thing is composed out of all such things as are uniquely in it and which are not in any of the other things. For

[224] Perhaps Proclus has in mind that a moving cause may activate a long chain of causes and effects in which the later stages in the chain are not 'images' of the moving cause – i.e. one couldn't discern from the effect the nature of the distant causes – and are not single.

[225] Festugière supposes that for both Proclus and Plato (56c5) the 'seeds of the bodies' are the elements. I suspect that Proclus has in mind the different sizes of triangles that go to make up the variously sized fire tetrahedra. With respect to Plato *Tim*. 57c, Timaeus Locrus says explicitly: 'Each of the four elemental bodies has many forms. Fire has the flame, light and "glowing", because of the inequality of the triangles in each of them' 99b8–11, trans. Tobin (1985). Cf. Proclus, *in Remp*. II. 43.6.

this reason these unique things are neither mixed with nor naturally related to anything external to them. This you can infer from the bodies here below. For it is not the case that a particular sort of body is nourished by *all* sorts of bodies, but rather some specific ones are nourished by other specific ones. This is because not everything is similar to the elements from which a body is composed, and that by which each thing is able to be nourished is also that which makes each thing grow, as the things that come in take the place of the things that go out (*Tim*. 81a). 30 **67**

It is for this reason too that corruptible things are corrupted, because external to them there are elements that resemble the opposing elements that make up [the perishable thing] – some resembling these elements, some resembling those – and each upon joining with the part that is congenial to it introduces destruction into the composite by destroying its harmonious proportions (*symmetria*). So among the corruptible things, the ratio (*logos*) make a particular difference, though the ratio of the simple bodies differs from case to case. But with respect to things that are indestructible, it is both the differences among them and also the ratios of their composition [that make a difference].[226] It is for these reasons that they are indestructible and genuinely monadic things, being the only things composed of these elements alone in accordance with one ratio and a single symmetry. These things, then, must be subjected to further interrogation. For we shall discover that it doesn't turn out otherwise when we look to the facts, not resting content with mere words as do many people who merely touch upon the theory of these things. But let us return now to the things that Plato has written. 5 10 15

Through this cause (*aitia*) and this reasoning (*logismos*) he contrived it as one whole out of all the wholes, perfect, free from age and sickness. (33a6–b1)

E. Additional lexis

The **cause** uniformly (*monoeidôs*) encompasses everything that it has produced, but the **reasoning** does so in a divided fashion (*diêirêmenôs*), as we 20

[226] 67.8–10: ἐν δὲ τοῖς ἀλύτοις καὶ ἡ τῶν αὐτῶν διαφορὰ καὶ οἱ λόγοι τῆς συστάσεως αὐτῶν [sc. ποιοῦσι τὴν διαφοράν]. In the case of perishable things, the preservation of the ratio of the simple elements is the key. So long as this ratio endures and the symmetry among the constituents lasts, the object survives. However, indestructible things are distinguished by two factors. First, they have special ratios of composition, but they are also composed of things that are not found externally to them. Thus, there can be no accretion of similar things external to them to upset their unique symmetry.

said earlier on (I. 399.19).[227] So it turns out that the universe in as much as it is one **whole** has been included under the **cause** and has come to be in accordance with cause, but in as much as it is something **composed out of all the wholes**, it has been included under reasoning. While it is *one* by the divinity of the Demiurge and in accordance with the divine unification, it is a *whole* in accordance with the connective wholeness of intellectual beings, for the former cause produces in the manner of wholes (*holikôs*), bringing it about that the universe is a whole. But, on the other hand, it is **composed out of all the wholes** in accordance with the multiplied causes of the forms, for the monad has the whole number [series] together with itself.[228]

The universe is **perfect** in as much as it has always reverted upon its first principle and has imitated the Demiurgic reversion. But it is **free from old age and disease** in as much as it has a life in full bloom, has always been awake and participates in amazing powers. After all, from the causes of its renewal the cosmos has present in it a life that is pure and unwearied. From the implacable [power of the Demiurge] (II. 2.7; 55.15) it has undefiled power. And through the former the cosmos is always becoming new in a manner free from age, but through the latter it is wholly free from illness, being purged of everything contrary to nature. The Demiurge, however, includes the cause of both these things.

iv. The fourth gift of the Demiurge: spherical shape

The Demiurge gave it a shape that was fitting and akin to it: for the living thing that was to encompass within itself all living things, the fitting shape would be the shape that includes all the shapes within itself. For this reason it is spherical in form, being entirely equal from the middle to the extremes: he made it rounded off into a circle[229] – of all shapes the most complete or perfect and most similar to itself – since the Demiurge thought that similarity was by far more beautiful than dissimilarity. (33b1–8)

[227] The distinction is drawn in the context of a discussion of λογισάμενος in *Tim.* 30b1. Discussion of this lemma led to differences of opinion about the number of Demiurges that there are. Amelius argued for a triad of creators, corresponding to the different activities of creating partial and entire natures. Iamblichus objected to this and moved the triadic structure into the creative activity of a single Demiurge (cf. Dillon's commentary on Iamblichus fr. 39).

[228] Cf. 66.4 above, and I. 322.29.

[229] Proclus has ἐτορνώσατο, the aorist of the verb τορνόομαι, both here and at 78.3, while Plato's text has ἐτορνεύσατο from τορνεύω.

A. Theoria: Plato's proofs

After the universal causes (*ta aitia ta hola*) of the cosmos and the universal composition (*holê sustasis*), of it and the establishment of an essence that results from its being composed from wholes that are integral to it (*ek plêrômatôn holôn*),[230] Plato speaks about the *shape* of the universe – that which surely has been assigned to the universe in accordance with its essence from its creation. This most similar of all the shapes is the fourth demiurgic gift to the universe (5.21 above).

Therefore, though there are also other demonstrations of the spherical shape of the cosmos which are both physical and mathematical and which we shall later examine, for now we shall first consider the Platonic demonstration (*apodeixis*). This really is a demonstration since the reason *why* it is (*to dioti*) is included along with the fact *that* it is (*to hoti*). The demonstration is itself triple: the first derives from the One; another from intelligible beauty, and a third from intellectual creation.[231] Or rather, each one of these demonstrations is multiple and is at least triple.

1. Demonstration from the One

You might say that the Demiurge is one immediately from the One, and you might say that the paradigm is also one, and you might say that the Good is one. From all this you might assume likewise, in the case of the **69** figures, that the figure which is unified to the highest degree is more divine and perfect than that which is not one. For that which the One is among the divine things, and that which the One Living Being Itself is among the intelligible living things, and that which the one Creator and Father is among the demiurges – this role is played in the same way by the sphere among the solid shapes. For the One is inclusive of the many henads, and the Living Being Itself includes the intelligible living things, and the single Demiurge is inclusive of the many causes. So likewise the one spherical shape is inclusive of all the shapes.

[230] Proclus here summarizes the third gift of the Demiurge – that it is a whole composed from wholes (*Tim.* 33a8).

[231] As Festugière notes, this is somewhat odd. The two demonstrations that follow are labelled more or less just as Proclus says: ἀπὸ τοῦ ἑνός (68.24; 68.27) and ἀπὸ τοῦ καλοῦ καὶ τοῦ πρέποντος (69.8), which corresponds to the argument advertised at 68.24 as ἀπὸ τοῦ νοητοῦ κάλλους. The third demonstration, however, is announced as ἀπὸ τῆς νοερᾶς ποιήσεως (68.25) but later called ἀπὸ τοῦ συγγενοῦς (69.28). The connection between affinity and the intellectual creation is not clear.

2. *Demonstration from the beautiful*

The second demonstration is from the beautiful and what is fitting. For the spherical shape is fitting to the one who receives, to the one who gives, and to the paradigm. (i) 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. the cosmos) is amicable to the figure that encompasses all other figures (i.e. the sphere). (ii) It is fitting to the one who gives: since the giver is intellect, it has reverted upon itself, so it has given [the cosmos] the shape most like it and fitting. For intellect has thoughts 'like the sphere moves on the lathe', as Plato says in the *Laws* (898a–b), being arranged in a manner that is 'regular, uniform, always in the same place and around the same point'. (iii) It is fitting for the paradigm because the intelligible universe is this sort of thing: [like the sphere] it converges in every way into itself.

> In every way like the volume of a well-rounded sphere,
> Equal from the centre and enjoying a circular solitude[232]

as Parmenides says. And Empedocles says the same thing, for he too makes the Sphere twofold – one sensible one, in which Strife holds power, and another intelligible one which is made continuous by Love. He even calls the one an image of the other, and it is obvious which one is an image of which.[233]

3. *Demonstration from kinship*

Third is the demonstration from what is akin (*syngenês*). For the sphere is akin to the universe, to the Demiurge, and to the All-perfect Living Being. For the universe, as it is one, thereby also has a shape appropriate to it own uniqueness – the sphere. For as the comos is itself single (*heis*), so too its shape is uniform.[234] The sphere is akin to the Demiurge because

[232] Proclus has run together quotations from two different Presocratic philosophers. The first lines are from Parmenides fr. 8, 43–4. The last line seems to refer to Empedocles' fr. 28, though with χαῖρον for γαίων.

[233] It appears that Proclus transposes the cyclical pattern in which Love and Strife alternatively rule over one realm to a division between two realms – one sensible and the other intelligible. Cf. *in Alc.* 113.18; *in Parm.* 723.22 and Westerink (1987).

[234] 70.1–3 τὸ μὲν γὰρ πᾶν, ὥσπερ ἐστὶν ἕν, οὕτω καὶ σχῆμα ἔχει τῇ ἑαυτοῦ μονώσει προσῆκον, τὸ σφαιρικόν· ὡς γὰρ αὐτὸς εἷς ὁ κόσμος, οὕτω καὶ τὸ σχῆμα αὐτοῦ μονοειδές. As Festugière notes, the argument here is rather obscure and it is not entirely clear whether one should translate ἕν and εἷς as 'one' or 'single'. Proclus' objective is to show that the cosmos is spherical and he will do so on the basis of the kinship between this shape and the cosmos. He assumes that the cosmos is one of a kind: 'one' in the sense of 'single'. It is thus akin to the sphere since there are not many species of sphere as

all things are contained in it, just as all things are contained by the Demiurge intellectually (*noerôs*). The sphere is akin to the paradigm because it proceeds primarily from it. Therefore this shape is ancestral (*progonikos*) to the cosmos, having been made to appear first in the hidden order of the cosmos itself.[235] For the words:

Unwearied it was borne round in a limitless circle

(*Orph. fr.* 71a)

refer to the aforementioned order. But this is seen even more clearly in the All-perfect Living Being, since the Theologian says about this divinity:

Impelled along an inexpressible circle.

(*Orph. fr.* 71b)

And it is even more obvious among the intellectual gods, for up there (*ekei*) is the intellectual shape – the straight and the curved – as was said in the *Parmenides*.[236] And, moreover, after these gods, the sphere is seen in the Demiurge, since he is intellectual intellect (*noeros nous*) and the universe is in him in the manner that is appropriate, and he receives the demiurgic potential from the gods prior to him. From this he is the creator of all the shapes within the cosmos. But what about this? After this is it not greatly honoured Hephaestus who shapes all the figures within the cosmos? – both the whole heaven and the realm of generation, making:

brooches, spiral armbands, rosettes and necklaces.[237]

And how could it be that he is not also willing to give to each thing the shape that is fitting when he produces the essence of the corporeal cosmos? But while Hephaestus shapes the universe with his own hands (*autourgikôs*), the Demiurge does so by his will (*boulêsis*) alone. For even handwork (*autourgia*) by the latter is will, and his creation (*poiêsis*) is thought (*noêsis*). So much then for what we shall say working from these facts.

there are many species of triangle or solid figure. Spheres may come in different sizes, but they do not thereby differ specifically. So the kinship is based around the equation of *monogenês* with *monoeidos*.

235 κρυφίῳ διακόσμῳ, *Or. Chald.* 198; cf. *in Tim.* I. 430.6 and *Plat. Theol.* III. 89.1. On the general notion of a hidden or ineffable phase in the procession from a unified cause, see *in Parm.* 760.13.

236 In the first hypothesis at 137d–e, Parmenides argues that the One partakes neither of the round nor the straight. Perhaps Proclus concludes from this that shape can be found at the intellectual level below the level of the One.

237 *Iliad* 18.401. Hephaestus there speaks of his activity hidden away in the cave with Thetis.

B. Why must that which encompasses all things be spherical?

For what reason, having been led to the conclusion that the sphere is
71 akin and fitting to the universe, has Plato declared that it is necessary that what encompasses all things should have a shape such as this?

Perhaps it was because the sphere is the regular solid with the greatest
5 volume, as is said by those who are clever at mathematics and as we shall show shortly (76.7).

Or perhaps it was because it is possible to inscribe all the equilateral polygons in the sphere but not into any other shape. For this reason a sphere is the shape most appropriate to that which is intended to encom-
10 pass everything. For the five shapes are also able to be inscribed in it. If, therefore, you look to the question of volume, the volumes of all the solids with equal surface area (*isoperimetros*) will be subsumed within the sphere – though they will surely not have a volume *equal* to the sphere, but instead will be seen to be less than that of the sphere.[238] But if instead we look to the question of shape (*schêma*), all [the other
15 shapes] are able to be inscribed in the sphere – something that is not true of the others. And this feature makes it especially appropriate for what is proposed since Plato also says that this shape is fitting by virtue of being **intended to encompass all the shapes**. For, since he intends to work up body (*sômatourgein*) from the five regular solids (54d), he
20 probably looks to all the shapes that are about to be encompassed by the universe. As a result, it is obvious that he looks not to the considerations about volume, but to the fact that all the shapes can be inscribed in the sphere.

Again, you might reason in a more complete manner as follows: that what is intended to encompass all things is obliged to rule over everything
25 in it, since otherwise it would not be inclusive of them. And the ruler of all things would assimilate or render all things similar to itself, since nothing is able to rule over that which is foreign and dissimilar. But that which is to assimilate everything to itself will be by a much greater degree similar *to itself* in order that it might communicate similarity
30 to the others.[239] That thing which, though a body, is most similar to itself is spherical. Therefore it is proper that this shape belongs to the

[238] Cf. Ptolemy, *Math. Syn.* I. 1.13.16 (Heiberg) together with Theon of Alexandria's *Commentary* 354.19–357.22 (Rome) and Pappus, *Synagoge*, Book 5.

[239] It seems perverse to insist that a thing's similarity to itself can admit of degrees. However Proclus' metaphysics of emanation commits him to just such a view. Cf. *ET* 18: 'Everything which by its existence bestows a character on others itself primitively possesses that character which it communicates to the recipients . . . [T]he character as it pre-exists in the original giver has a higher reality (*kreittonôs esti*) than the character bestowed' (trans. Dodds).

cosmos, since it is both most perfect or complete (*teleôtatos*) and also most similar. On the one hand, it is most perfect or complete in as much as it is inclusive and incessant,[240] for the straight line is entirely incomplete in as much as it is always able to be extended. But the circle and the sphere are most perfect or complete in as much as they do not admit of increase and in as much as the limit of its motion has also been made its origin.[241] On the other hand, it is most similar in as much as it is continuous with itself, smooth and evenly ordered. Such then are the arguments of Plato. 72

1. The question considered in itself

Let us consider this teaching in and of itself and gather together all the various arguments.

a. Iamblichan arguments

First of all, let us establish it in a philosophical manner (*philosophôs*) by means of Iamblichan conceptions (*epibolê*).[242]

(1) Since it is necessary for the cosmos to be harmonized in relation to the universal soul that presides over it, it must be fit for or be assimilated to the very life-giving (*zôiogonos*)[243] shape of the soul. Therefore, just as the Demiurge established the soul in accordance with two circles (*Tim.* 36c), so too he contrived the universe to have a spherical form, to be an image of the soul's self-motion. For this reason, our own vehicles [of the soul] are made spherical and move in a circular fashion when the soul has been made especially similar to intellect. For both the thought (*noêsis*) of the soul and the circular motion of bodies imitate the intellectual activity (*noera energeia*), just as motion in a straight line imitates the ascent and descent of souls, since these are the motions of bodies when they are not in their proper places.

(2) And furthermore, the incessant motion of the universe is similar to unlimited power and the uniform revolution is like the simplicity of being. The circular motion of the wholes being carried around the same centre in the same manner is similar to rest throughout eternity.

[240] Cf. *in Parm.* 1119.28 on the ceaseless motion of the universe.
[241] Cf. Aristotle, *Physics* 8.265a27–b2.
[242] The following section = Iamblichus *in Tim.* fr. 49 (Dillon). Dillon hypothesizes that Iamblichus might actually have presented ten arguments in his commentary, since this would be more proper to a Pythagorean. You might take the three points raised at 72.20–3 as three distinct ones: unceasing motion; homogeneous circularity; and circularity around a centre.
[243] Cf. *ET* 155.

(3) Moreover, just as the single motion of the cosmos includes all the motions therein and the single wholeness includes all the bodies – both the wholes and their parts – and as the single nature includes all the secondary and tertiary natures, so too it is necessary that the one cosmic shape encompass all the shapes. But the sphere is this sort of thing, being able at the same time to encompass the many and yet be one. Such a capacity is surely genuinely divine – being such as to rule over all the things that have been encompassed by it and yet not departing from unity.

(4) And here is something further related to that point. As the one Intelligible Living Being includes all the [kinds of] intelligible living things through a single unification, so too the cosmos, when it is made similar to the Paradigm, includes all the encosmic shapes by virtue of its spherical shape. For only the sphere is able to take in all the elements. Therefore just as the cosmos represents (*apeikonizein*) the intelligible universe by its uniqueness, so too it imitates the inclusion of wholes in that universe by its spherical shape.

(5) Moreover, the cosmos is assimilated to the intelligible Beauty itself through having this shape. For how could what is entirely smooth, symmetrical and similar be regarded in any other way than as beautiful? So if it was necessary for it to be the most beautiful of sensible things, it was also necessary for it to possess this sort of shape – one that is everywhere equal, definite and accurate.

(6) Once again, the spherical shape is most closely related to the Limit itself. For the other shapes are cut off from bond and limit through having a plurality of sides, angles and breaks. But since the sphere is monadic and simple and has all sides equidistant, it reaches up to limit as its cause.

(7) Furthermore, that which is such as to bring many into one, as well as that which is able to engender (*to gennêtikon*), and the reproductive (*to spermatikon*), enjoy a shape like the sphere. This is obvious even from seeds and also from the ruling parts of animals (i.e. their heads). For nature makes these to be spherical in form as far as possible.

(8) Moreover, that which is immutable, unbreakable and everlasting is most akin to the spherical shape. For since it everywhere converges upon itself, it is most powerful. For the centre [of the sphere] is such as to make the whole sphere one continuous thing. Therefore the Demiurge very properly established the universe which is continuous with itself in a spherical form. These then are the things that one might say on this matter from a philosophical point of view (*philosophôs*).

b. Aristotelian arguments

In a different manner, one can argue for the spherical shape of the cosmos from a physical point of view (*physikôs*), just as Aristotle endeavoured to do. One might thus reason in the same way:

(1) Since the universe is moved in a circle and it has been shown that there is nothing exterior to the outermost circumference – neither void nor place – it is necessary that it be spherical, since it is not possible for the shape of the universe to be bounded by straight lines. For if it is rectilinear, then there will be such a thing as void. When a rectilinear body revolves in a circle, it will never occupy the same place because of the change in position of the angles and surfaces. Since the [perimeters of] other individual kinds of shape are not at an equal distance from the middle, there will be void where the least distant surface is when the volume of the body no longer occupies the space it did before. Whether it is in respect of length or breadth, there will be a surface least distant from the centre of rotation. For the void has been distributed equally, and in one part of it there will be body, but another part will be the space that has been left by body owing to the shorter distance from the centre of rotation to one of the perimeters.[244]

(2) Once again, one might argue from the physical point of view that the universe is spherical from the secondary things. For the Earth is spherical in shape, as is obvious from the fact that all things are in every way carried toward the middle of it. And water has been distributed around the Earth and it is spherical in shape. For it will flow into a hollow place until it lays hold of the centre of the Earth or it has made its own surface a similar level to that of the Earth's. But the air is around the water and the earth and around the air is the fire. But if these things are so, then the heavens will also be spherical. For there will be void within the heavens unless it too spherically encompasses the fire.[245]

[244] The argument summarizes Aristotle, *Cael.* 2.4, 287a11–23. Suppose for the sake of argument that the world is a cube or any other regular solid apart from the sphere. We accept it as already shown that there can be no void external to the cosmos and that the cosmos revolves, as evidenced by the movements of the stars. Whatever we deem to be the centre of rotation, not every point on the surface of the cube will be equidistant from it. Let A be the furthest point from the centre of rotation and B be some point along the axis of rotation at a lesser distance from the centre. When the cube moves and B has the same orientation in relation to the centre that A previously had, there will then be the empty space, external to the cosmos that was occupied by the corner where A was but not now fully occupied by the surface where B is. Thus the rotation of any solid other than a sphere implies the existence of extra-cosmic void.

[245] A very brief summary of the line of argument at *Cael* 2.4, 287a32–b15. Aristotle's argument in fact proceeds in two stages. First he argues that the cosmos must be spherical

(3) Further still, nature apportions to most primary (*prôtistos*) bodies the most primary shapes and to the simple bodies simple shapes. 'For in each genus the one is prior to the many and the simple to the composite.'[246] Therefore just as the motions have been apportioned appropri-
20 ately (*oikeiôs*) to their own functions so that the simple things have simple motions and the compound ones compound motions, so too nature has allotted fitting shapes – simple shapes to some, but composite shapes to

if the layers of elements above water share a border with the water and if the surface of the water is spherical (287a32–287b5). What surrounds a sphere (with no gaps and with even distribution, of course!) must be itself spherical. Next, he argues that the surface of water in a hollow within the Earth must be convex to continue the line of the roughly spherical planet in which the hollow exists (287b5–21). Imagine two radii in the sphere of the Earth, AB and AC. Now construct the triangle ABC. Let AD be a perpendicular in this triangle and AE the radius created by extending the perpendicular to the line that describes the spherical shape of the Earth. D will thus be within a hollow depression in the Earth. The water will collect in such a hollow 'until equality is established' (287b11). But since it is AE, not AD, that is equal to the other radii, the water must extend to this point and its surface must therefore be convex and conform to the curve of the sphere.

Festugière refers to Adrastus' discussion of this proof preserved in Theon of Smyrna, 123.4 ff. (Hiller). Adrastus adds empirical arguments for the curvature of the sea's surface, based on the difference between what one can see from the deck as opposed to the top of the mast. Further, Adrastus makes the reasoning in the second argument clearer. The water will flow from the edges of the hollow at B and C, to the lowest point at D. It will continue to fill the hollow until the water in the centre of the hollow is as far from the centre of the Earth as the points at the edge of the hollow, i.e. until the distance between the water's surface and the Earth's surface is equal to a radius.

Note that Proclus omits the geometrical aspects of the argument as it is found in both Aristotle and in Adrastus. This, I believe, is quite conscious. Proclus arranges this argument under arguments φυσικῶς. Adrastus, however, prefaces this argument with the words καὶ φυσικῶς δὲ καὶ μαθηματικῶς ἡ παντὸς ὕδατος ἐπιφάνεια, ἠρεμοῦντος μέν, σφαιρικὴ δείκνυται οὕτως.

246 Aristotle, *Cael.* 2.4, 286b16. The line continues, 'so the circle must be the primary plane figure'. The case for the primacy of the sphere is made at 286b24. Even if we accept the premise asserting the primacy of the sphere – whether for Aristotle's reasons or on the basis of the fact that it is most similar to itself or such that the other regular solids may be inscribed in it (69.8–27 above) – there still remains the question of why the cosmos itself must be the *most primary* body. True, it is that of which all other bodies are parts. But equally, it is the whole constituted by those parts. Festugière refers to Cleomedes 86.5–8. But note that Cleomedes' argument is importantly different and sounds more like Proclus' argument from beauty: 'the most perfect or complete (*teleôtatos*) body has been furnished with the most perfect or complete shape. Of all bodies, the cosmos is the most complete, and the sphere is the most complete of all the shapes.' The cosmos is certainly complete in the sense that there is nothing outside it. But now the question arises about why the sphere is similarly complete in relation to other regular solids. Perhaps the answer is given by the first of Proclus' 'physical' arguments: alone among the solids, the sphere's rotation does not imply the existence of any void external to it.

others. But shape is like the visible image (*agalma emphanes*) of the form, the shape of the shape, and like an exhalation (*pnoê*) of the peculiar existence (*idios hyparxis*) of each thing. This is why that which is simple in respect of its essence proceeds into one sort of shape, but that which is a various mixture has the outward appearance (*idea*) of [a similarly various] shape.

(4) 'The heavenly motion is the measure of motions, but the measure in the case of each kind of motion is that which is least. And the least motion is the fastest',[247] but the motion of the periphery of the cosmos is the fastest of the motions, and if this is so, then the heavens are spherical in shape. For the swiftest moving thing is the sphere on account of the fact that it has the smallest base or place upon which it rests, as the Eleatic Stranger says (*Statesman*, 270a8).

(5) Furthermore, among the class of shapes, some have similar parts (*homoiomerê*) while others have parts that are dissimilar to one another (*anomoiomerê*). Necessarily, in the case of the ones with dissimilar parts, dissimilar shapes have been distributed from their nature. For polygons and, in general, such angular shapes are composed out of a greater variety of surfaces. But in the case of those having similar parts, the similar surfaces are allocated in accordance with their value (*kat' axian*). The sphere alone among the solids is composed out of shapes that are similar, since all the others are dissimilar. Some have two surfaces, like the cone; others have three like the cylinder, others have four or five or even more, like pyramids arranged from bases which are successive polygons. But now if the aether is composed of similar parts, and if the shape of that which consists of similar parts is similar, and the spherical is that which is similar among solids, then the aether is spherical in shape.[248] So much then for the attempts to prove the spherical shape of the cosmos physically.

[247] The quotation is from Aristotle, *Cael.* 2.4, 287a25, but it is unclear whether Proclus really effectively summarizes this argument or uses this line as a premise for an argument of his own. His summary certainly has very little in common with Simplicius' more extensive treatment in his *de Caelo* commentary. Aristotle's brief argument appeals to the premise that 'among the lines that return upon themselves, the line which bounds the circle is the shortest.' Since the swiftest movement follows the shortest path, the movement of the heavens must be that of something spherical. Needless to say, there are many puzzles here – puzzles that Simplicius works hard to try to solve. No part of Aristotle's argument, however, appeals to Proclus' considerations about a sphere resting on a small base. And just as well too! How is it that Proclus imagines the sphere of the heavens to rest on anything?

[248] Proclus' fifth argument *sounds* a bit like the argument of Aristotle's *Cael.* 1.7, 274a31 ff. to which Festugière refers the reader, but it is actually importantly different. Aristotle there argues that there cannot be an infinite body, whether it is one with homogeneous or heterogeneous parts.

c. Mathematical arguments

Now if it is necessary to belabour the point by mathematical demonstrations, then let's go on. We'll go over briefly the things that are believed by those who have knowledge in these matters.[249]

(1) First, they attempt to construct an argument from the fact that the stars are carried about in parallel circles. This applies to both the planets and the fixed stars. To the extent that we proceed toward the north, the portions of the circles that are cut off are always unequal. As a result, some of the circles just contact the horizon while others that are smaller in diameter than these do not contact it. At the limit of this there is a final point that is motionless around which all the circumferences are moved.[250]

(2) Next we can construct an argument from the fact that the days and nights become unequal in accordance with the sun's motion to the north or the south.[251]

(3) Next is the argument from shadows. How does it come about that when the sun begins to rise and set, it is more to the north for us and appears to us to pass through Cancer, while when it comes to be directly overhead at noon (*en mesêmbrinôi*) it projects shadows toward the north? How can this be, unless it results from the universe being moved in a circle while it inclines toward our position?[252]

[249] As with the physical arguments, which are largely adapted from Aristotle, the next set of proofs in Proclus are not original. Festugière suggests that we may usefully compare his short summaries of the arguments of the astronomers with material found in Geminus (Stoic, first century BC), *Introduction to phenomena* (ed. Manitius); Cleomedes (Stoic, late second century AD), *On the circular motions of the heavenly bodies* (ed. Todd); and Theon of Smyrna (Platonist, fl. *c.* AD 115–40), *Mathematics useful in the interpretation of Plato* (ed. Hiller). The latter gives us frequent quotations from Adrastus' (Peripatetic, second century AD) work on Platonism and Pythagoreanism.

[250] Festugière refers to Cleomedes I. 5, 44–9 (Todd) (= 76.16–23 (Ziegler)) and Theon of Smyrna 121.12 ff. (Hiller). But this reference is somewhat misleading. The subject of the discussion in Cleomedes is the sphericity of the Earth. Second, Cleomedes' argument is that if the Earth were flat, the pole around which the stars move in concentric circles would be at the same height for everyone. Proclus' passage makes a similar – but not exactly the same – point: as we move north, stars that transit low in the southern sky disappear below the horizon. The two points perhaps go together and Cleomedes thinks that one can infer the spherical shape of the cosmos from the spherical shape of the Earth (I. 5, 6–9). It is certainly possible that Proclus holds the same view and is being very, very brief in his exposition.

[251] Festugière invites us to compare Geminus' *Introduction* (6.7 ed. Aujac = 70.12–15, ed. Manitius) and Cleomedes (78.2–4 Ziegler = I. 5, 54–6 Todd). Here Festugière is clear that Cleomedes presents this as an argument for the sphericity of the Earth.

[252] This seems to be an inference to the best explanation. The sun must travel through a vast arc above us if it rises in the northeast and sets in the northwest during winter, and

(4) Again, one can construct an argument from the fact that those stars **76**
that are not moved with respect to depth[253] always appear to have the same size. For if the heavens were not spherical in shape but rather were cylindrical or had some other such shape, then it would be necessary for the sun, when it moves to the south of us, to appear to be smaller in virtue of the fact that the interval between us and it is not equal to what it was before. But nothing of this sort appears to happen.[254]

From these facts that we have briefly related astronomers attempt to show that the universe is spherical.

That the sphere has the greatest volume of all the regular solids is also demonstrated by these men. And they also show how it is possible to inscribe all these shapes in the sphere, but it is not possible to do this for all the shapes in any of the polyhedra. Nothing requires us to transcribe the things that these people have already demonstrated, for this work has been created for the person who has already been sufficiently instructed in these matters. But notwithstanding such facts, I must at least put it on record that it has been shown that within the class of figures that are equilateral, equiangular and have an equal perimeter, the one with the greater number of angles is the greatest. Thus they demonstrate that the circle has greater area than any equilateral and equiangular figure with the same perimeter. They also show that the sphere is greater [in volume] than any solid shape with the same surface area. In particular, they show that these things are true of those equilateral and equiangular polyhedra discussed by Plato (*Tim.* 53c–56b). Some use the demonstrations from Euclid to do this while others use those by Archimedes.[255]

As I said, it is possible for those familiar with these things to pick up the proofs for themselves. But after we have completed the commentary, we will arrange a collection of mathematical theorems that bear on the *Timaeus*, examining what is scattered throughout the notes in greater detail in order to enable lovers of such spectacles[256] to have all

yet at the same time casts a northern shadow at midday. Festugière cites no parallel for this argument in earlier works, nor can I find one.

253 76.1 μὴ κατὰ βάθος κινουμένους. I assume that Proclus here refers to the stars rather than the planets, Sun or moon. For a similar argument, see Ptolemy, *Almagest* I. 5, 12–13 (Heiberg). Here Ptolemy notes that the argument may seem to be vitiated by the fact that the Sun and the Moon appear larger closer to the horizon. In fact, he says, it is not, since there is another explanation for this fact and the difference is illusory.

254 Festugière refers to Adrastus ap. Theon 120.10 ff.

255 On these propositions about isoperimetric figures, see Theon of Alexandria, *Commentary on Ptolemy's Syntaxis* I. 3, 354–74 (Rome). The relevant portions are translated in Thomas (1951) II. 387 ff. The propositions here stated are not proved in Euclid book 4, though one can use some of the methods to do so. Similarly, one may use theorems from Archimedes' *On the sphere and the cylinder*, as Theon does.

256 That is, lovers of the spectacle of the truth; cf. *Rep.* 475e.

these mathematical theorems collected together for the sake of various judgements. But that's more than enough mathematics.

C. Lexis

But we must return to the text of Plato and look at the manner in which each of the words has been intended. We said earlier (68.14) that among intellectual things the shape comes after the whole, and so having demonstrated that the universe is a whole, Plato very reasonably moves on to the
77 subsequent instruction concerning its shape. But since this proceeds into the universe from the demiurgic cause – it was for this reason that he said that it was **given** from up there (*ekeithen*) – and because it is clear that the giver has that which he gives to others to a greater degree, therefore the spherical is in the Demiurge, but in an intellectual manner (*noerôs*), just as it was there in the All-perfect Living Being intelligibly (*noêtôs*) and even prior to the All-perfect Living Being in a hidden fashion (*kruphiôs*).[257] For if it is requisite to say what seems to be the case, where intellect is, there also is the defining feature of the sphere. For intellectual activity has the sort of essence which the Athenian Stranger likens it to (*Laws* 898b). But in one place this activity exists in a unified and intelligible manner, as those who are wise in divine matters say, and in another place it exists intelligibly, but together with a greater intelligible division. At another place, however, it exists in an intellectual fashion (*noerôs*) but with diverse variations. At yet another place where the sphere is seen, it exists in the manner of sensibles (*aisthêtôs*) with extension. And this phase is not denominated simply 'spherical', but rather 'having a spherical form' (*sphairoeidês*) in as much as it is an imitation of the intellectual or intelligible sphere. For the universe is moved in a circle because it imitates intellect, but then the intellectual or intelligible universe would be more strictly a sphere and the genuine (*ontôs*) study of astronomy would be concerned with the latter. This then is 'the astronomy above the heavens'.[258]

And on a further point, **being entirely equal from the middle to the extremes** belongs to the sensible sphere because all the lines from the centre of the Earth to the limits of the sphere are equal in

[257] Diehl supposes that this echoes *Or. Chald.* 198 = *in Tim.* I. 430.6–7. Cf. n.234 above.

[258] Pindar fr. 292 (Snell) quoted in *Theaetetus* 173e6. The "digression" in the *Theaetetus* receives a great deal of attention at the hands of the Neoplatonists since it is one of the texts that contains the account of the Platonic *telos*: assimilation to god in so far as this is possible (*Tht.* 176b). For further reference to the 'higher' astronomy, see *in Parm.* 828.30 and *in Tim.* III. 277.15–25 which specifically connects this with *Tht.* 173e again.

length, for the word 'entirely' signifies extension in three dimensions.[259] And it also belongs to the mathematical [sphere], for up there (*ekei*) middle and extension are everywhere equal. And it also belongs to the intellect, though in a different mode: for to converge upon itself, and for the part to stand in the relation to itself that it does to the whole (like something that is the same colour all over) and to possess all the powers that have been collected together in it in relation to its own One – this is the nature of the spherical in intellect. Furthermore, proceeding still higher, it will not be possible at this stage to discriminate the centre from the sphere because of the ineffable and unified condition that is the defining feature of the intellectual level. Therefore he says that it has all the straight lines everywhere equal from the centre in order to illustrate the contrast with the circle, for in the latter case the word 'everywhere' is not apposite since this figure only has two dimensions. **78**

Plato uses the words **he made it rounded like a wheel**, since it is through the use of the lathe that the bodies with which we are acquainted are accurately made to have a circular shape as the lathe trims away the unequal aspects of the body. And it is obvious that what is similar and what is complete or perfect especially pertain to the sphere. At any rate,[260] that which is similar is analogous to the One, but that which is perfect is analogous to the Good. So it turns out that through both these facts the spherical has led us up to the first thing (*to prôton*). When he says that it is **most similar** and **most perfect** he means that it has been maximally unified (*henikôtatos*) and maximally enformed by goodness (*agathoeidestatos*) in equal measure. For what is mixed is not similar or perfect; nor is what is straight, since it always admits of further addition or of being formed into an angle. Only what is spherical is most similar and most perfect.

In these cases it is manifest that what is similar is better than what is dissimilar. For similarity is something that makes things unified, but dissimilarity produces divisibility. The one is ranked along with Sameness while the other is ranked with Difference. The former is the cause of simplicity among objects, while the other is the cause of diversity. Therefore just as he who established the universe discovered that, in the case of the things that are visible by nature, those possessing intellect are finer than those that lack it (*Tim.* 30b1–3), so too he surely also thought that the similar is better than what is dissimilar. For among the intelligibles, similarity is better than dissimilarity and the same is true

[259] For the near consensus on the position of the Earth in the centre of the universe, see Heath (1981).

[260] I follow Festugière in treating the οὖν in 78.6 (ἀνὰ λόγον οὖν τὸ μὲν ὅμοιον πρὸς τὸ ἄν . . .) as bearing the sense of γοῦν.

among powers, thoughts and among things that have been created. From this fact one might well be amazed at those Platonists who posit that the Different is superior to Sameness when Plato says that [the Demiurge thought that] **similarity was by far more beautiful than dissimilarity**. In general, dissimilarity insinuates itself into beings from their matter, but similarity comes from form alone and from intelligible causes. Therefore since similarity is better by far than dissimilarity, so Sameness is also better than Difference.

The 'judgement of Zeus' (*Laws* 757b6) is the same. For this reason even among the things within the universe, the similar is better than the dissimilar, whether among substances (*ousia*) or in motions or shapes or in all of the other respects. This is quite reasonably so, for the very procession of objects is accomplished through the similarity of what is produced to the cause of production.[261] Reversion is once again an originary point (*archêgos*) of another sort of similarity. Therefore, on account of these things it is entirely reasonable that the cosmos has been placed under the rule of Similarity, since it is a god according to the divine form itself. Whence Plato attempted to show that the shape of the universe has this [spherical] quality from the fact of its similarity. And the Pythagorean Timaeus too has given similarity as the most primary cause of the shape of the universe, together with the physical explanation that has been given. 'For only the sphere', Timaeus says, whether 'at rest or in motion' was such that it could be fitted together 'in the same space', since it never 'gives up its place nor occupies another place'.[262] This is why[263] Aristotle (73.27 above) after him knew full well that if you ascribed any other manner of shape to the world that you would introduce void outside it owing to the difference between the angles and the unequal distance between the centre of any of the other solids and their exteriors.

[261] Cf. *ET* 29: 'All procession is brought about through the similarity of what comes second to what is first.'

[262] Proclus here refers to the work attributed to Timaeus of Locri (95d). The passage reads in full: 'The body of the universe is well off in terms both of shape and motion: in terms of shape, because it is a sphere and so is similar to itself at every point and can contain all the other shapes of the same kind; and in terms of motion, because it eternally exhibits change in a circular movement. Only the sphere, both while at rest and in motion, was able to be fitted together in the same space so that it never gives up its place or takes another place, since it is at every point equidistant from the centre' (trans. Tobin (1985)).

[263] Festugière suggests that the ὃ καὶ Ἀριστοτέλης at 79.11 actually amounts to διὸ καὶ and refers back to ὅθεν at 79.4 above. It is unclear whether the μετὰ τοῦτον refers to Plato or the Pythagorean Timaeus.

And externally he made it round and perfectly smooth, doing so for the sake of many considerations. (33b8–c1)

It might seem that the argument (*logos*) is once again brought around to the same thing. For what would be the difference between this 'smoothness' and the previous use of the word 'circular'? Or what about the similarity has been transformed? How is this not included in what was previously said about similarity?

But at the same time, there *is* a difference between examining what sort of shape the whole has – the extent of it right down to the centre of the earth – and looking only at the extreme surface of the universe considered in itself. And there is, it seems, a single point to which these words about smoothness urge us: to show that the universe has no organs for acquiring knowledge, nor any need for parts adapted for motion. Neither does it do anything else, nor undergo anything, but rather does and undergoes in itself and by itself (*Tim*. 33c) – this being the fifth demiurgic gift introduced into the cosmos (II. 5.22–4). Therefore the account concerning the smoothness of the world's body stands as a middle term between what is said about its volume and what is said about its soul. For the proximate limit of its body is smoothness, but the transcendent (*exêirêmenos*) limit of the world is soul; and prior to this [limit there is] intellect, for this is the boundary of the soul itself. But even prior to intellect is the single universal divinity, bringing together the plurality. So one might answer the initial question in this sort of manner.

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A more complete response, however, is that since it is a luminous whole, the universe is as bright as possible in virtue of the surface that it has and the fact that it is suffused with divine radiance. For this reason the poets also place Olympus at the summit of the cosmos, since this is wholly and intrinsically illumined:

> the air is outspread clear and cloudless and over it hovers a radiant whiteness. (*Od*. 6. 44, tr. Murray)

The smoothness is a symbol of this shining subsistence (*hypostasis*). In virtue of what, then, are the highest points of the universe smooth? **For the sake of many considerations**, he says: in order that it might be bound together with the soul and the intellect organically (*autophyôs*) and harmonized with the hypercosmic lights through its similarity to them.[264] Therefore the smoothness is significant of receptivity of the

[264] Cf. *in Tim*. III. 82.19–83.17 on *Timaeus* 39b. Proclus there brings together reflections on the role of the intelligible sun in *Republic* with Orphic (fr. 86, Kern) and Chaldean texts (fr. 59, Majercik).

highest points through which the universe is capable of receiving the illuminations (*eklampsis*) from Intellect and Soul, in just the way that mirrors receive reflections in virtue of their own smoothness.

But long ago the theologians also accepted the mirror as a symbol of the receptivity of the universe to intellectual fulfilment (*apoplêrôsis*). For this reason they say that Hephaestus made a mirror for Dionysus.[265] When he looked into it and saw his own image, he proceeded to the universal divisible creation (2.10 above). Thus one might say that what Plato has now written about the smoothness of the external surface of the cosmos is meant to remind us of the preparation of this thing with the form of a mirror. Hence the universe is a corporeal thing of this kind since its exterior is shiny, and in as much as this is so it is connate with its own intellect and with the Demiurge. Because of this, the poets (80.8) also found the Demiurge at the summit of the highest point of the cosmos, such was the receptivity (*epitêdeiotês*) allotted by him to the cosmos for participation in intelligible causes.

But if you wish, the same smoothness can also function in another manner, as a symbol of the divine and simple life in the cosmos. Now
81 in our case, since we had a particular sort of life, we also have parts of bodies that have various shapes and mixtures because a different kind of life means different kinds of bodily parts – though they are nonetheless prepared according to nature. But the universe, by contrast, has a single, simple life. The things that terrestrial living things are in need of in virtue of their enmattered and particular lives – these things the universe has been purified from. Therefore it is receptive of a single life and transcends variety and has been prepared for one life – a life not receptive of division. And on account of this it is said that **on the outside he made it perfectly smooth** because it was put together by the demiurgic cause in a manner suitable to its being receptive of a single life, being contrived as the organ of such a life. And the following words also signify this:

D. Theoria: Does the universe have sense perception?

It had no need of eyes, for nothing visible remained external to it; nor ears, for there was nothing to hear. Since there was no air around it, it had no need of respiration. (33c1–4)

For through these words Plato appears to do nothing other than deprive the universe of any particular sort of life and the particular organs which

[265] Cf. *Orph. fr.* 180 and 209 (Kern) and Proclus' explication of this story of Hephaestus at *in Tim.* I. 142.26 ff.

have been conjoined to us in our descent into generation. For while we remain above we do not require those lives that are plural in form or the particular organs, but the luminescent vehicle (*augoeides ochêma*)[266] suffices for us when we have all senses in a unified manner (*hênômenôs*). So if it is the case that whenever *we* were liberated from generation, we were purified of all such kinds of life as this, what must we think about the universe?[267] Shall we not say that it has a single and simple kind of life? And that it has been motivated to be a whole in relation to such a life and fashioned from equal parts all around in order to be fulfilled by this single life? Or must we not agree that these things hold true in the case of the universe to an even greater degree? For things that are whole or universal (*ta hola*) are more divine than those which are partial or particular, and what includes is more divine than what gets included by it. So much then for the common conceptions (*koinê ennoia*) of Plato's text.

But since Plato takes away all the senses from the cosmos – in order: sight, hearing, smell, taste and touch – let's go on and examine this very thing first: whether the universe is perceptive or not. For among the ancient writers, some go one way and some go the other on this question. For, on the one hand, we hear the theologians saying <that intellect is the>[268] 'font of perception' and about the Father that

> He encompasses the intelligibles with intellect and brings sensation to the cosmos.

And what's more, we have this from the Greek [poet]:

> Thou Sun, that beholdest all things and hearest all things
> (*Il.* 3.277; *Od.* 11.109, tr. Murray.)

– not that the seeing and hearing in him takes place in a particular or partial manner (*meristôs*) as it does in us, but rather it happens in virtue of a single life and in a single subject. But even in our case, as Aristotle has announced, what is strictly sensation is a single thing and what is a sense organ in the strict sense is one too.[269] Neither were the Greek

[266] *Or. Chald.* 119 and 120. Cf. Proclus *in Remp.* II. 154, 195–6, 199; *in Tim.* II. 85.4, 355.17 and, in general, Finamore (1985).

[267] Festugière (ad loc.) is keen to stress that Proclus' words are to be taken in a causal, not a temporal sense. It is not that at one time we were liberated from a body and at that time had no organs. Rather, the point is that in the eternal procession of souls into generation, there is a stage where the soul has only the luminescent vehicle.

[268] Cf. *Or. Chald.* 7 and 8 (Majercik). Festugière likewise follows the supposition of Diehl at 28.3: τῶν θεολόγων πηγὴν αἰσθήσεως λεγόντων <τὸν νοῦν>.

[269] *On Sleep and Waking* 455a13–25. Aristotle here claims that the five sense modalities are different ways in which the common sense is active. It is unclear whether this remark

sages ignorant of divine perception, nor did they decline to say that the Demiurge himself possesses it.

> His intellect infallible of royal aether incorruptible is formed,
> By it he hears and marks all, and there exists nothing –
> No voice, no cry, no sound, no rumour
> – that escapes the ears of Zeus. (*Orph. fr.* 168)

And why do I bother to speak of the Theologian when we hear Plato himself say that the universe is a living thing (30b) and living things are characterized by sensation, so that when he says that a plant is a living thing, he immediately gives it a share of some other form of sensation (77ab). In light of these things, as I said, we shrink from even suspecting that the world lacks sensation.

But on the other side of the question, when sensation is looked down on among the kinds of knowledge as something that is particular and concerned with images, we are cautious about sending forth this sort of life into the universe. For 'sensation is unable to grasp truth' as was written in the *Theaetetus* (186c9). Since sensation only knows the affections and images of objects it is customarily said by everyone <to be third from the truth.>[270] Therefore it is better, in order that we may be in **83** between these two positions, to take away all sorts of sensation like this, but give to the universe some other form of sensation better than these and one more appropriate to the gods.

So what sort of sensation is this and in what manner should the universe be assumed [to have it]? That the universe is sensitive we may make clear from the fact that it is a living thing and also from the fact that its entire soul is capable of discursive reason (*dianoia*) and opinion (*doxa*) and gives to the body of the universe both of these qualities through participation – that is, both opinion and discursive reason.[271] For if opinion is a certain sort of rational sensation (*tis logikê aisthêsis*), the cause of

in *On Sleep* is entirely consistent with Aristotle's rather terse remarks on the topic in *De Anima*. For the Neoplatonist approach to awareness and their use of Aristotle on this point, see Blumenthal (1996), 137–41.

[270] Kroll supposes there is a lacuna at 82.29 and conjectures καὶ τὰ παθητικὰ καὶ τὰ εἴδωλα γιγνώσκουσα τῶν πραγμάτων ἡ αἴσθησις <τρίτη ἀπὸ τῆς ἀληθείας> παρὰ πᾶσιν εἴωθεν λέγεσθαι.

[271] One assumes that Proclus has in mind here *Tim.* 37bc. There Timaeus says that the contribution that the circle of the Different makes to the discourse within the world soul is true opinion. But he describes the result of the circle of the Same's concern for objects of reason (*to logistikon*, cf. *in Tim.* II. 312.12 and Cornford p. 95) as *nous* and *epistêmê*.

sensation in the body will be the kind of life that results from this.[272] And there will also be a certain image of discursive reason in the universe, which we might call 'cosmic imagination' (*phantasia*) in as much as it pictures to itself (*eneikonizein*) the intuitive thought (*noêsis*) of the former [i.e. *nous*] and it has in it invisible impressions (*typos*) of the sensibles that come to be in the entire history of the cosmos. From this, therefore, and from many other things as well, it is possible to bring to mind (*hypomimnêskein*) the fact that the universe is sensitive. But to determine *what kind* of perception it has requires an appropriate investigation.

(1) Now, of the kinds of perception,[273] I say that the first and most proper kind is that which imitates intellect. For everywhere the first things [in a series] have a likeness to the things prior to them on account of their continuity <to the previous order>.[274] So this first kind of perception includes the sense object in and of itself. Neither does it pass from one thing to another, for this would already be a kind of particularization (*merizomenon*). Further, it does not proceed into what is external to it, for such a thing is incomplete. Instead, having the whole sense object in itself, it is more like consciousness (*synaisthêsis*).[275]

(2) The second kind of sense after this is one that does proceed outside [itself], but is completely in actuality (*kat' energeian teleian*) and everywhere apprehends the whole knowable thing entirely and always in the same manner. It is free from affections and all inabilities which are proper to particular, enmattered organs.

[272] The claim by Platonists that opinion is a kind of rational sensation appears to result from Plato's disagreement with Aristotle about the relation between sensation, reason and opinion. Plato alleged that the sense perceptual discrimination that this thing is white presupposes reason (*syllogismos*) and opinion (*doxazein*) (*Tht.* 186a–187a). Aristotle denied reason to animals and made such discriminations a function of the faculty of perception alone. As early as Alcinous' *Didaskalikos* we find the claim that sensation involves opinion-based reason (*doxastikos logos*) (156.8–11). The converse of this would simply be the claim that opinion is a kind of rational sensation. Simplicius [?] (in *DA* 187.30) suggests that there is a specifically human form of rational sensation which is able to cognize itself. He further reports that Iamblichus thought that our sense perception was homonymous with the kind of sense perception found in other creatures which 'inclines toward the body'. It would make sense for Proclus to endow the universe – a far better thing than us – with sense perception at least as rational as ours. See Sorabji (1993).

[273] For a detailed discussion of the forms of sensation in Proclus, see Blumenthal (1982).

[274] Accepting Kroll's conjecture, πρὸς τὰ προσεχῆ for a lacuna at 83.19. For the premise here invoked, see *ET* 28.

[275] Festugière seems right to delete the odd feminine article at 83.22 ἀλλὰ [ἡ] τὸ ὅλον αἰσθητὸν ἔχουσα ἐν ἑαυτῇ καὶ οἷον συναίσθησις οὖσα μᾶλλον.

(3) The third kind of perception, being affected by external things, is a mixture of persuasion and knowledge: it originates from an affection, but ends up in knowledge.[276]

(4) The final kind of sense is that by means of which knowledge is present in the most obscure way, and it is largely passive and borders on physical co-affection (*sympatheia*) and because of this is unable to know
84 forms of sensibles. For example, it cannot know that the thing that affects it is hot or cold, but only that it is pleasant or painful. Such is the sort of perception that Plato gives to plants as the *Timaeus* goes on (77b), this being only a registering (*antilêpsis*) of pleasure or pain from the sense object.

So since the procession of perception from on high goes like this, the cosmos is perceptive in respect of the first sort of perception. For as a whole it is itself both a thing that is seen and an eye, since we say that the sun is an eye as well as each of the stars. Therefore the whole cosmos is both vision and what is visible, and it really is 'grasped by perception and opinion' (28a2) by virtue of its sensing itself and holding opinions concerning itself, for it is grasped by these [sc. perception and opinion] in the primary manner. So the knowledge in it is utterly complete and the sense perception is undivided, and the universe is all things: sense object, sense organ and sense, just as the Demiurge is his intellect, activity of thinking (*noêsis*) and object of thought (*noêton*). Just as the particular bodies have been brought together by the universal body, so too in the universal sense the many [individual] senses are encompassed. [This kind of perception] does not know [only][277] the colours or the sounds of sensible things, but rather the whole essence of them in as much as it is end mattered and individual (*atomos*), because it possesses the sensible essence and is sensible in itself rather than merely possessing them accidentally.

As that which is always intelligible is not in one way intelligible and in another not, but entirely intelligible – not by that which intelligizes in a divisible or partial manner of course, but by the divine intellect – in the same manner the generated sensible is also not in one way sensible but in another not sensible, but rather is wholly so. (Though again, this is not the case for us who perceive in a divisible or partial manner, but it is so for the total living creature in which the universal sense is located.) For as the thought of the gods is one thing, but that of particular living

[276] Cf. III. 286.2 ff. on this form of sensation.

[277] For the supplement, see 86.17–20. Though Proclus writes: καὶ οὐχὶ τὰ χρώματα καὶ τοὺς ψόφους γιγνώσκει τῶν αἰσθητῶν, in light of what he goes on to say he must mean that the world's perceptual capacity does not *merely* know the colours and sounds of the sensibles in it. It knows this, of course, but also a great deal more.

things is another, so too the perception of the gods is one thing and that of particular living things is another: the one also knows the particular sensible essence, while the other knows only the things that pertain to the essence.[278]

The cosmos, then, has the first kind of sensation which is non-discursive (*ametabatos*), unified by the object of knowledge, complete, and established in actuality. But the living things that are universal and exempt from generation[279] have been allotted the second kind of sense perception. Because they are parts of the universe, their sense proceeds over the whole, for there is something external to them. But because they transcend generation, they encompass the sense object only in an active manner that is free from passivity.

But as for the particular living things, as many as have had communion with generation and make use of organs by 'luminous vehicles', these have the mixed form of sensation which comes to be from affection and knowledge.

Last there are what we might call the final living things, such as plants, which participate in the traces of life and do not entirely have sense but rather participate in it, possessing even this in an affective manner (77ab).

So since there are different forms of sensation – one kind being of the whole, while another is of particular things, and while one knows the essences, the other knows the images of sensible things – since this is so, it is not necessary to be dismayed when Plato deprives the cosmos of all the particular sense organs. For hearing [in the world soul] is not divided off from vision. Nor for that matter is hearing separate from sight even in our own animal spirits[280] (*pneuma*) as we said (82.9), but

[278] I.e. the accidents. Cf. Simplicius *in Phys.* 232.15 τά μὲν συμβεβηκότα περὶ τὰς οὐσίας μεταβάλλεται and *in DA* 276.26 τὰ περὶ τὰς οὐσίας πάθη καὶ συμβεβηκότα.

[279] Festugière suggests that Proclus has in mind the stars.

[280] The mention of *pneuma* is odd here. It certainly doesn't seem to advert to anything in the text of Aristotle that Proclus goes on to quote. Breath is discussed in *On Sleep*, but not in connection with the common sense and the unity of the various sense modalities. The explanation, I believe, can be found later in III. 236.31–238.26. There Proclus takes up the question of whether the non-rational soul and the pneumatic vehicle of the soul are mortal or immortal. Proclus follows Syrianus in supposing that the Demiurge creates the 'summits' of the irrational life and one of the soul's vehicles. However, the younger gods (*Tim.* 41a–d) create a further mortal manifestation of this irrational life and a mortal vehicle intermediate between the immortal vehicle and our fleshy bodies. Concerning the perception that occurs in the immortal psychic vehicle, Proclus writes: 'Therefore the single and impassive sense [created by the Demiurge in the immortal soul when he gives it the summits of irrational life] generates a sense in the pneumatic vehicle which is single but passive, which in turn generates in the fleshy body a sense which is multiple and passive' (*in Tim.* III. 237.24–7). Note that Proclus feels free to

instead the sense is really a single thing and the sense organ in the strict sense is one thing, as Aristotle says (*Somn. Vig.* 455a22). Therefore the cosmos requires neither eyes to extend its vision to what is external to it, nor ears to take in anything from the outside. Instead it is both eye and the thing seen, ear and the thing heard, and the single sense in it knows all the sensible objects. For where would the single sense in us – which is prior to the many – come from unless it be from the universe? The universe knows the beauty in itself through sight and the harmony extended through the whole of itself through hearing. Therefore the universe has no need of eyes with which to see, nor of ears to hear. It also has this eyeless character in virtue of being an image of the intelligible god in relation to which it has been moulded. For Orpheus also says this, that Love has no eyes:

> Cherishing by his breast swift, eyeless Love.
> (*Orph. fr.* 82, Kern)

So surely then the universe is connected through love to the things that come before it, seeing the beauty in these things through the beauty in itself; but this seeing is not accomplished with particular senses.

v. The fifth gift of the Demiurge: self-sufficiency

86 There was no air around it that it might be required to breathe; nor did it need to have any sort of organ by which it could take nourishment into itself or again any organ with which to expel what it had previously digested. For since there was nothing else, there would be nothing to come to it or leave it from anywhere. Nourishment was present to it from its own waste, and it came about from its design that all things that it experienced or did were experienced in it and done by it. For its builder thought it better for it to be self-sufficient rather than in need of something else besides itself. (33c3–d3)

A. Theoria

Through these words he takes away two other kinds of sensation from the universe: smell and taste. It doesn't have the former because the universe would not have respiration, for that which breathes requires a sense of smell. (This is so in this case, even though it is not true that everything that has a sense of smell is such as to breathe. Nonetheless

bring in Aristotle as someone who shares this view (III. 238.20)! Could it be that in the passage at hand he wants to draw in even the Stoics to testify to the unitary nature of the faculty of sense perception? Cf. the quotation from Chrysippus reproduced by Calcidius in his *Timaeus* commentary (220 = *SVF* II. 879).

the animals with a sense of smell that do breathe are more perfect than those who do not (cf. II. 87.13)). Therefore this sense is taken away from the universe. As for the latter case, he takes the sense of taste away because the universe does not need to eat; for [only] animals which are nourished are in need of a sense of taste.

Well, then we may again ask, 'How can this be?' Isn't it like this: the particular senses do not pertain to the universe, but there is a single, simple sense which is cognizant (*gnôristikos*) of all the things in it: the colours, sounds, tastes, odours, qualities, being themselves the essences of sensible things as they are in an underlying subject. For if the single sense in us makes use of all the particular senses and knows all [the particular sensibles] by virtue of the same thing (*kata tauton*), how much more then must the cosmos know at one time all the various sensibles by virtue of one *logos* and a single sense! Therefore, because it is one thing by virtue of its essence and in just the same way it has been allotted a shape that is uniform, so too it has a single sense that encompasses all the sense objects.[281] After all, it also has a single nature that brings together all the bodies and makes them alive. These then are the teachings (*dogmata*) pertaining to the universe. Let us proceed by addressing particular points. **87**

1. *Smell and respiration*

First then there is the inspired manner (*daimoniôs*) in which he traces the use of smell back to respiration, but not to the discrimination of good <and bad>[282] odours, thus providing the more encompassing cause as something to do with our respiration. For whenever we sense good or bad odours, we are breathing. But it is not the case that whenever we are breathing we encounter these things. Respiration is thus more natural and more inclusive than the defining feature of smell, since such animals as have the ability to smell but do not breathe because they lack lungs are less complete than those that do breathe.[283] It is thus quite reasonable that he has made his argument from the case of the animals

[281] The reference to shape is meant to suggest an analogy with the perfect spherical shape of the world's body. As the sphere includes all the regular solids that are assigned to the elements (*in Tim*. II. 71.1–10), so too the World's single sense faculty encompasses all the objects of the individual senses.

[282] Accepting Kroll's conjecture at 87.3: τῶν εὐωδῶν <καὶ δυσωδῶν> διάκρισιν.

[283] Aristotle notes that fish and insects can smell but do not breathe (*Sens.* 443a2) since things that lack lungs do not breathe (*PA* 3.7). Alexander brings the references together in his commentary (*in Sens*. 90.1–20) though he does not make Proclus' claim about the relative completeness or perfection of such creatures. The scholiast to M (II. 327.1) notes only the insects.

that are more complete. The argument goes like this: if the universe is to have the capacity to smell, then it would likewise need to have these [capacities], just like in the case where the more complete of the animals with a sense of smell also have the capacity to breathe.

2. *Taste and nourishment*

Second, he has referred the use of taste to [the capacity of] nourishment. For nature has established this as a criterion for the flavours through which the things that are nourished actually grow. Plato's use of the word **digested** is expressive of this fact. Now the cosmos does not need nourishment from outside, but rather it provides itself with nourishment and grows on its own by supplying waste to itself. It does this in the first instance, if you like, by a division into two parts: the heavens, on the one hand, *cause* growth and change in all things, while the things in the region below the moon are *affected* by growth and decay. For in this lower region the generation of one thing is the destruction of another, but the motion of the heavens is the cause of each process.[284]

Next, the heavens themselves are receptive to both growth and decay in an analogous way in virtue of their movements – movements such as rising and settings [of heavenly bodies], manifestations and hidden elevations, the dejections of visible heavenly bodies and changes in their illumination – through which the things in heavens give off and receive something, just as the things in the sublunary region also do, for genesis is directed by these things. But keep in mind that the things above the level of the moon have only an *analogous* kind of growth and decay, while the things below the moon are receptive of both of these essentially (*kata tên ousian*). The moon itself, on the other hand, is really a kind of boundary or isthmus[285] between these regions, showing that it is a principle of
88 change in itself through the waxing and waning of its light. For in the case of the things that are prior to the moon, the same form remains in all respects through their "growth and decay". But in the case of the things that come after the moon, their entire existence is naturally such as to ebb and flow; while in the case of the moon, the *essence* remains while the external light (*to exôthen phôs*) is changed according to the waxing and waning – something which does not happen in the case of the luminous objects that occur above the level of the moon. Therefore it is not necessary to say that the heavens are fed from exhalations as some

[284] The general view is familiar from Aristotle *GC* 2.10. It is also present in ps.-Ocellus, *On the nature of the universe* 36, 1–14, a work to which Proclus has referred earlier.

[285] Cf. II. 104.19: 'They say that the moon is a middle term in as much as it is an isthmus between the divine and the generated.'

people think.[286] For things that are in need of an influx from outside or are capable of being added to or reduced do not possess indissoluble bonds.[287] Therefore the heavens remain immutable, just as the ancients Proclus of Mallos and Philonides said.[288] And among the more recent philosophers, all the Platonists of the school of Plotinus say this too.

For how [by the mention of nourishment in the lemma] could he have even intended to make a statement about the nourishment of the heavens and stars when he hasn't given us an account of their generation yet? It actually seems that only the elements have had a generation so far, and looking at them and the way in which they pervade each other and the fact that all things are in all, he has called this mutual interpenetration 'nourishment' – something which the very universe undergoes through its own agency and does to itself by virtue of the fact that its constituents all share in one another. So when he establishes the other heavenly bodies, Plato then introduces their illumination and the association that all things have with one another on account of these bodies. Therefore Plato is presently only looking at the composition of the universe from the four elements, but then having seen that there is some sort of mutual association among them, he said that the destruction of some parts of the universe is the nourishment of others. But what each of these is is not now obvious, though this much is presently clear: that all things give [something] to one another in order that the universe may become one, and [all things are] in one another with the result that they nourish one another, and this takes place without any diminution on the part of the things themselves. After all, everything is in earth and everything is in fire and everything is in the middle elements. In this way the whole cosmos is nourished through its own agency by parts of itself since it has all things in all. But now let us consider what needs to be said about the text we are discussing. **89**

B. Lexis

If nothing is added to the universe, there is no body external to it. If nothing leaves the universe, there is no void outside the cosmos. For such a void would be pointless if it were receptive of nothing, [for it

[286] Diehl refers this to Philolaus DK A18 (= ps.-Plutarch *Plac. Phil.* II. 5). It is unclear to me that this text is apposite, since it says that the cosmos is fed by exhalations from the moon and the sun.

[287] Perhaps Proclus here alludes to *Tim.* 43a2. In this passage, it is specifically said that the souls of the Younger Gods created by the Demiurge possess indissoluble bonds. But the whole sensible cosmos is itself a created god, so it is reasonable to infer that its bonds are also of this sort.

[288] Nothing is known of these philosophers.

would not be needed] as that which in fact received the cosmos [was needed].[289] This conclusion about the non-existence of the void was one which was particularly welcomed by Aristotle, who both did away with the actual void and also maintained that the universe was one of a kind.[290] That nothing is added to or leaves the universe Plato argued for first by the words **there was nothing else**. The conclusion that nothing leaves from it comes from the fact that its own decay is made the suitable nourishment for the universe. So, while having no organs for feeding, it has nourishment in itself and it itself is at the same time the food and that which is nourished. This is surely parallel to the way in which it lacks sensation of anything external to it, yet has sensation extended within itself and is itself a sense-object to itself. The fact that Plato wished the same argument to hold good for both these cases is, I think, clearly shown from his saying that **all things that it experienced or did were experienced in it and done by it**. And if all the things that happen are actions or undergoings of the universe in itself and by its own agency, then neither decay nor destruction must be said to be evils simpliciter. For if the blessed *person* does no evil to himself, how less likely is this in the case of the universe? This divine [conclusion] is an additional bonus that ought to be drawn from the account before us.

And [with the words **from its design** (*technê*)][291] he has turned back upon the true cause of all the things in the worldly (*perikosmios*) realm, namely the demiurgic craft and the perfective (*telesiourgos*) origin of wholes. For from up there (*ekeithen*) the craft goes down to the demiurgic order. It is for this reason that the *Oracles* have called the Demiurge of the universe 'skilled craftsman (*ergotechnitês*)'[292] – an epithet which Plato splits into two phrases. At one time he calls the works of the Demiurge in the cosmos 'works of which I am the creator and father' (41a7), just as the *Oracles* also say 'For after he thought his works (*erga*), the

[289] 89.4–5: μάτην γὰρ ἂν εἴη, μηδενὸς ὂν δεκτικόν, καθάπερ τὸ τὸν κόσμον δεξάμενον. The argument is directed against the Stoic belief in extra-cosmic void. Cf. Simplic. *in Cael.* 284.28 ff. I have supplemented the translation in this way because Proclus supposes that there is in fact something that receives the cosmos. This is space – the incorporeal body whose substance is light and which comes after the World Soul.

[290] The connection between these two is spelled out in *Cael.* 279a12–18: because there is no void outside the cosmos, there is no place for another cosmos to be.

[291] Festugière is right to note that πάλιν δὲ in 89.21 does not indicate that Proclus is returning to a previous point, but rather that he is taking up the examination of a new phrase from the lemma. I have translated in such a way as to make clear what this new point is.

[292] *Or. Chald.* 33 (Majercik); also quoted at *in Tim.* I. 12.16: 'Thus the skill which exists within the Demiurge both remains within him and is himself, according to which he is called "skilled worker" by the *Oracles*, and "Craftsman of a fiery cosmos".'

self-generated paternal Intellect . . .'[293] But elsewhere he calls the activity of the Demiurge a craft (*technê*) by reference to which the goal of the universe's self-sufficiency has been defined. For since he is good, the Demiurge made everything as much like himself as possible (*Tim.* 29e) and this means that all things are complete and self-sufficient, since self-sufficiency is an element of the good. But even though the cosmos has the potential to look after itself, it has not in any way been divorced from its maker through this self-sufficiency. Rather it has been to a greater degree unified with him. For the more self-sufficient it is, to that degree it is rendered even more similar to its creator. But the greater the degree to which it has been made similar, it is to that extent more completely united with the demiurgic goodness. Therefore the universe is self-sufficient in as much as it is [its own] sense-object and *not* in need of other sense-objects – this is the term applied to such things – but it *is* in need of gods, in as much as it is always being filled up by them. Or perhaps it would better to say that nothing is in need of them in the sense that it *lacks* them, for the divine is present at all points and the universe has been prepared to serve as a receptacle of divine goods. Therefore, just as the Similar is better than the Dissimilar (33b8) according to the 'judgement of Zeus' (*Laws* 757b6, cf. II. 78.28), so too self-sufficiency is more divine than need. For self-sufficiency rules among the gods and Similarity dominates in the realm of being. This is yet another teaching of the great Zeus.

90

C. The organs of touch

But he thought it pointless to attach hands to the world with which it could grasp or ward off anything. Nor did it need feet or any support to stand on. (33d3–34a1)

Touch is the last of the senses. Generally speaking animals participate in this capacity with respect to the whole of their bodies, but particularly with respect to the hands. For the hands are most sensitive to touch,[294] as is seen from their activity. Furthermore the hands provide us with two uses – for through them we both receive the things that are delightful, but we also ward off the things that cause us pain. But the universe is not able to grasp anything, for it has all that which it wants. Nor is it able to ward off anything that might hurt it because there is nothing alien to it. Therefore it should not require hands. For

[293] *Or. Chald.* 39 (Majercik), quoted at greater length at II. 54.10–16.

[294] The superlative, *haptikôtaton*, is unusual. It occurs once in Aristotle (*PA* 660a21) but he claims that the tongue is most sensitive to touch, since it is the main organ of taste and taste is a kind of touch.

neither nature nor god makes anything in vain, as Aristotle says (*Cael.* 271a33). So it turns out to be quite reasonable that the Demiurge has
91 not provided it with its own hands, for this would be pointless.

But since what is productive of motion – I mean what is productive of motion in a *physical* manner – depends upon that which is sensitive, the dialogue moves from a discussion of sense organs to a discussion of the means of propulsion in a manner that is at the same time appropriate and well-reasoned. For the feet were prepared as organs to facilitate
5 motion in a straight line, and the other parts are subservient to the activity of taking steps – that is, other parts such as the leg, the knee, the thigh and so on. But it is impossible for the universe to move in a straight line, for there is no void outside the universe, as was shown earlier (II. 73.26–74.6). Thus these parts – the ones for propulsion and the
10 organs of sense – are taken away from the universe for these reasons. It must be reiterated that in this passage when Plato takes away the organs that relate to movement, he takes away only the feet, but not the wings, because these are sufficient for the movement of the more complete or perfect kinds of animals; and Plato in doing this acts in the same manner as he did in the case of smell and respiration.[295]

Furthermore, one must reiterate that although these things [sc. the
15 *organs* of motion or sensation] are in no way present in the universe, there exist sensation and movement in another manner. For since it includes everything that is sensible in some way in it, and since it itself is the first sensible thing, the universe has a single sense conjoining it to such a sensible object. The case is parallel to the way in which the
20 intuitive thinking of the Demiurge has been conjoined to the whole intelligible [region] and is said to 'engulf the universe' in it.[296] In this

[295] Presumably the wings in question are those that are assigned to the soul itself in *Phaedrus*. The argument seems meant to parallel the one at II. 87.1–13. There the removal of respiration and smell take place together in spite of the fact that there are some animals that have the power to smell but lack respiration. According to Proclus, Plato is reasoning from the case of the more perfect animals in which these capacities go together. Here too, then, taking away the feet is sufficient for taking away the power of rectilinear motion, in spite of the fact that some lesser animals manage rectilinear motion by means of wings, not feet.

[296] Cf. I. 324.14–325.24 and the further discussion of ingestion at 93.16 ff. The ingestion or engulfing of one god by another is a recurrent theme in the Orphic *Rhapsodic Theogony*. Kronos, who is ruler among the gods prior to Zeus, swallows the male offspring of his union with Rhea (frs. 58, 132, 138, 146), save for Zeus. Rhea gives Kronos a stone in place of Zeus and this causes him to vomit up the other gods he has swallowed (147). Having deposed and castrated Kronos, Zeus (identified by Proclus with the Demiurge) swallows Phanes (identified with the intelligible god). Within him all things are unified and become one within Zeus's belly (167). Vomiting all these things up, he becomes the creator of the present world. See West (1983), 70–5.

way, 'the cosmos engulfs itself' by its perception of itself and encircles the knowable by its innate (*symphyês*) knowledge. But it also includes in a different manner powers analogous to hands, digestive organs and breath. After all, it has the power to rule over and to guard all things, and these are its hands. It includes progressively more perfective orders (*taxis*), and these are analogous to digestive parts.[297] Finally, it has received enlivening causes which are analogous to the parts associated with breathing.

Moreover, it also has other powers, some of which fill it up with invisible causes while others connect it to the intelligible light. Of the latter, some powers have a structure (*logos*) analogous to vision, while others are analogous to touch. To those who consider it both physically and theologically, the cosmos has a motion analogous to the kind of sensation it possesses. For as its own sensation is of itself, so too its internal motion **92** proceeds in a circle around itself. In both cases it possesses these features through being assimilated to the paradigm. For in the case of the paradigm there was both intuitive thought that converges upon itself, and life that revolves around itself, and knowledge that is neither discursive (*kata metabasin*) nor divided into parts (*kata merismon*), but is instead entirely complete (*autotelês*) and united to the intelligibles themselves. The intellect up there at that level is that sort of thing – being in action prior to activity (*pro energeias energôn*) – because it has never proceeded but abides 'in the Paternal Abyss' and in the innermost sanctuary through 'the god-nourishing silence [of the Fathers]'.[298]

vi. The sixth gift of the Demiurge: a motion appropriate to intellect

For he assigned it a motion appropriate for its body – of the seven [kinds of motion] the one that is particularly relevant to intellect and wisdom. (34a1–3).

A. Theoria

Among the ancient philosophers, some supposed that the cosmos reverted upon the intellect and credited its motion to the love of this

[297] Perhaps what Proclus has in mind is that the progressively more perfect orders within the cosmos (in the manner in which, for instance, heavenly forms of fire are more perfect than those found below) are analogous to the progressive refinement of nutriment in the process of digestion.

[298] *Or. Chald.* 18 and 16 (Majercik). In the latter case, I have filled out the quotation from the longer citation in Proclus' *in Crat.* 63.25–6.

primary object of desire, and said that nothing goes down into the cosmos from the intellect. In this manner they deprived intellect of its capacity to be productive and gave it a status equivalent to things that fill us with desire to see them. But such things have no capacity to engender anything in virtue of their own natures [as visually appealing objects].[299] Now others among the ancients agreed that intellect or soul or whatever it was above the world *did* something to it, but they did not grant motion to the cosmos as something innate and appropriate, and instead said that it was led to revolve in a circle only extrinsically. This latter view is one Aristotle knocked on the head as a theory that destroys the everlasting character of the universe: for that which happens by force is not everlasting.[300]

But Plato, on the other hand, has been saved from both of these kinds of mistake. He gives motion to the cosmos as something innate and appropriate and also provides evidence of its demiurgic cause. This motion is the sixth demiurgic gift to the cosmos (cf. II. 5.24 ff.) – a motion that imitates intellect and which we say[301] it has *both* in virtue of itself and also from the father. For the word **assigned** sends us back up to the paternal cause (for that from which the universe gets its being (*ousia*) is also the source of its natural motion). But **a motion appropriate for its body** refers to the distinctive nature of the cosmos through which it motivates itself to move in this fashion by its own agency. For it has a certain self-motion in virtue of its life, and in virtue of its shape (which is spherical) it has something appropriate to circular motion.[302]

Perhaps even if only one of these were given, the other one would have been implied as well. For if you were to say that the motion

[299] One is tempted to suppose that the target here is Aristotle: the description of thought thinking itself (i.e. intellect) as the prime mover – mover that causes motion by virtue of being an object of desire – seems consistent with *Metaphysics* 12.7–9. At *in Tim*. I. 266.28 Proclus claims that 'the peripatetics' make the creator of the world separate, but do not make him an efficient cause (*poiêtikos*) but rather a final one (*telikos*). Following Syrianus (*in Metaph*. 117.25–118.11), Proclus claims that Aristotle should have followed his own reasoning on infinite power (*Phys*. 8.10) to the conclusion that god is both the cause of the world's motion and also its beginningless existence (I. 267.16–268.6). It is unclear to me whether the present passage about depriving the intellect of generative power is part of this complaint or a separate one. See Steel (1987) and Sorabji (1990).

[300] Proclus here puts together two separate arguments from Aristotle's *De Caelo*: first that unnatural motion cannot be eternal (269b5–14) and second that motion introduced by an external force counts as unnatural (301b16–21).

[301] Festugière suggests <φαμὲν> where Diehl has <φασὶ>.

[302] Diehl inserts τὴν after τὴν ζωήν in 93.2. I follow Cornford (1957), 95 and Festugière in omitting this and read instead: ἔχει γάρ τι καὶ αὐτὸς καὶ κατὰ τὴν ζωὴν αὐτοκίνητον καὶ κατὰ τὸ σχῆμα σφαιροειδὲς ὂν πρὸς τὴν κύκλῳ κίνησιν οἰκεῖον.

is appropriate to the universe, where else would it have got it except from the father by whom it also got its essence? But to take the other case, if Plato had merely said that the motion of the cosmos was given from the Demiurge, then since the Demiurge is intellect and determines all things in accordance with their worth, the cosmos would have been the recipient of a form of motion entirely appropriate to it. But surely the philosopher has woven both explanations together in order that we may see the similarity of the cosmos to the Demiurge. For as the Demiurge himself thinks himself and turns upon himself and sees the intelligibles in his activity in relation to them (which in turn become the centre of the demiurgic thinking),[303] so too in the case of the cosmos: it is carried around itself and converges upon[304] itself and dances (*choreuei*) around its middle (which has become the centre of cosmic motion). And in the same manner in which the Demiurge is said to engulf the intelligible [cosmos] and retire (*chôrein*) into himself, the cosmos surely also encloses the centre of itself in itself. For when the theologians[305] talk about one god engulfing another, this is a kind of enclosing. When an *ancestor* is said to engulf or ingest someone, this signifies that they comprehend the intelligibles in an intellective manner (*ta noêta noerôs perilambanein*), but when it is one of the *offspring* that does the engulfing, they comprehend the intellectual things intelligibly (*ta noera noêtôs*). This is because, as they go forth, the things that have generated them revert again upon themselves and completely maintain their own integrity.[306] Well, then, the universe has imitated both of these. First, in as much as it revolves around the centre and includes the centre within itself, it imitates the ingestion of an ancestor. In the other case, in so far as it includes those things that are generative of itself in itself (where Plato says **nourishment was present to it from its own waste**) and having undergone division by itself, it again withdraws into itself – in these respects it imitates the comprehension of sons in fathers. These things have been stated for the sake of the analogy between the universe and the two fathers.

[303] Cf. *Plat. Theol.* V. 25.20–26.1.

[304] Reading πρὸς ἑαυτὸν συννεύει at 93.15 for πρὸς ἑαυτὸν νεύει. Earlier (II. 73.22, 77.26, 92.3) both the spherical shape of the cosmos and the motion of intellect are said to *converge* upon themselves – συννεύειν. νεύειν is a verb the Neoplatonists typically use for 'decline'. Cf. Plotinus II. 9.4 and Proclus *in Tim.* I. 251.12: 'to decline toward sensible things'.

[305] Cf. n. 294 above.

[306] Cf. *ET* 30: when B proceeds from A, B remains in A in a certain sense and A is not thereby diminished.

B. The seven kinds of motion

But look here: how in these words one of Aristotle's fundamental principles (*Cael.* 302b7) – that the motion of simple bodies is itself simple – is once again anticipated. First, therefore, the body in the cosmos which is
94 simpler than the others is moved with a circular motion, as is appropriate. Next, the whole universe is also moved in a circle, for the bodies that come after the simplest body are circulated as much as possible.[307] For what else can '**appropriate**' be other than 'natural'? But what is natural is the motion of the universe in a circle that results from its essence. For
5 as it was allotted a spherical shape, it turns out that the natural motion is circular.

Furthermore, circular motion has no opposite (*Cael.* 286a3). For since there are seven kinds of local motion – in a circle, upward, downward, to the left and to the right, toward the front and toward the back (*Tim* 43b) – one can see that six of these motions would have opposites (for those
10 motions are opposite which are to and from opposite places), but circular motion transcends all oppositions. When rectilinear motion is brought about and sustained by circular motion, as mechanics shows,[308] how could one say that one of these motions is opposite to it? After all, one
15 opposite is the agent of destruction for the other opposite, not that from which it is engendered!

Nor does Plato stop his account there, but having mentioned the defining feature of circular motion, he has shown its amazing superiority to the other forms of motion. He called it after[309] the [motion] **relevant to intellect and wisdom**, and not in a simple way, but he added the

[307] Festugière suggests that we follow MPQ in omitting ὄν in 93.32–94.2: πρῶτον οὖν τὸ ἐν τῷ κόσμῳ σῶμα τῶν ἄλλων ἁπλούστερον [ὂν] κινεῖται τὴν κύκλῳ κίνησιν ὡς οἰκείαν, εἶτα καὶ ὅλον τὸ πᾶν· καὶ γὰρ τὸ μετ' ἐκεῖνο κυκλίζεται κατὰ δύναμιν. Failure to do so, he claims, introduces an unintelligible opposition between the World Body (τὸ ἐν τῷ κόσμῳ σῶμα presumably) and the Universe (ὅλον τὸ πᾶν). It is unclear to me why τὸ ἐν τῷ κόσμῳ σῶμα might not designate the material of the heavens, albeit not very exactly. τῶν ἄλλων ἁπλούστερον ὄν then makes the point that since this body is simpler than the others, it is moved with a circular motion. This motion is then transferred to all the bodies below it. I am inclined to agree that MPQ is better, but it is unclear that Diehl's text is 'unintelligible' as Festugière claims.

[308] How does circular motion bring about and sustain rectilinear motion? Presumably Proclus has in mind the idea that the circular motions of the heavenly bodies stir up and maintain the rectilinear motions of bodies in the sublunary realm. The idea that this is a conclusion of 'mechanics' may hark back to Alexander's wide use of 'mechanics' for 'the science of things that come to be and pass away' (*in Metaph.* 251.33), though Proclus' own account of the scope of mechanics at *in Euc.* 41.3 is much narrower.

[309] Note Proclus' use of the verb ἐπονομάζειν, the verb that Plato uses when he says the sensibles are 'called after' Forms. If x participates in the F itself, then x is called after

word **especially**. For of the seven kinds of motion, the circular kind imitates intellect and the intellective life in it – having been established 'around the same point and proceeding according to one ratio (*logos*) and a single order'.[310] It also has a motion in which rest predominates. But all remaining kinds of motion imitate the soul. For in the case of soul there is the primary transition from one thing to another, and in it are present the intelligible from above, but the object of sensation from below. And while the circle of the Same moves to the right, the circle of the Different moves in the opposite direction. And while it has intellect in front of it, soul has nature behind it. For this was how its origin was constructed (36c). The circular motion of the soul has been made appropriate to intellect in respect of both of these numbers, whether you wish to deal with it by reference to the monad or to the seven, enumerating the *first* motion or the *seven* individual motions. For the monad and the seven are particular kinds of intellective number: the monad is surely the very intellect, while the seven is the light that derives from intellect (*to kata noun phôs*).[311] So because of this as well, the intellect around the cosmos (*ho perikosmios nous*) is both monadic and of the nature of seven (*hebdomadikos*), as is said in the Orphic poems (*Orph. fr.* 276, 313 Kern).

Furthermore, the monad belongs to the order of Apollo, while seven is related to Athena[312] – therefore once again we have intellect and wisdom (34a2). As a result, Plato shows that circular motion is dependent upon intellect and wisdom through these numbers. But rectilinear motion, on the other hand, exhibits its kinship with the defining features of soul through the number six. For this number, six, is appropriate to the soul. This will be made clear as we go along. But for now let's go on to the next lines from Plato.

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it. When x participates in the F, it is an imitation – in the same way in which in the next line Proclus says that circular motion imitates the motion of intellect.

[310] A loose citation of *Laws* 898a8–10.

[311] For other uses of this phrase in relation to seven, cf. *Plat. Theol.* V. 14.13; *in Tim.* II. 271.18 and Damascius *in Parm.* 130.7. Iamblichus [?] *Theol. Arith.* traces the identification back to early Pythagoreanism but does not really explain it: 'Philolaus says that after mathematical magnitude has become three-dimensional thanks to the tetrad, there is the quality and "colour" of visible Nature in the pentad, and ensoulment in the hexad, and intelligence and health and what he calls "light" in the hebdomad' (Waterfield, 1988).

[312] Cf. *in Parm.* 768.1–7. The epithet and an explanation can be found in Iamblichus [?] *Theol. Arith.* 71.4 and 58.23–59.1. Seven is not the product of any of the other numbers in the decad. Nor does it yield any of the numbers in the decad when multiplied by another member of the set. Hence it is like Athena in having no mother nor father and in being a virgin, i.e. not 'mingling' with any of the other gods.

Accordingly he caused it to move uniformly (*kata tauta*) in a circle in the same place (*en tôi autôi*), turning round and round within its own limits (*en heautôi*); he took from it all the other six motions and gave it no part in their wanderings. And since for this revolution it needed no feet, he made it without feet or legs. (34a3–8)

C. Theoria

It was said earlier (94.17) that intellect and wisdom are the paradigm of circular motion. But the account of what this is and how it has been modelled on intellect is given in the words of this lemma. For circular motion involves being drawn around in its own limits uniformly in the same [place]. It is described in the same way both here in what Timaeus says and also in the *Laws* (898a8) by the Athenian Stranger. In these texts, the word **uniformly** means the same thing as the phrase 'according to one ratio (*logos*) and in a single order'.

But what if the universe were moved in a circular fashion, but also had various reversals, as it says in the myth in the *Statesman* (269a)? In order that we should not take it this way, Plato places the word **uniformly** prior to the other words in this sentence. Therefore the Platonist Severus has just got it wrong – we'll speak freely against him on this point – when
96 he admits these mythical reversals of the motion of the cosmos, thus making the cosmos both generated and also ungenerated. For Plato says that the universe moves **uniformly** and 'always moves according to one ratio and a single order'. But to take this reversal of motion literally does away with the single order of motion. But the way in which this reversal of motion communicates through myth something consistent with Plato's thought has been related in what our teacher has written on this dialogue.[313]

The words **in the same** [place] (*en tôi autôi*) manifest the changelessness in change and the fact that its [circular] motion is dominated by rest. Because there is no void outside the universe and because it is nonetheless necessary for the universe to be moved since it is a natural body – for nature is a principle of motion – it is moved around itself and is turned about in the same place. For the volume of the universe occupies the whole place and the parts of its extension are occupied by the parts of the universe, and while, considered as a whole, it is changeless, there is nonetheless transposition from place to place by virtue of [the movement of] its parts.

[313] It is unclear whether this refers to a commentary that Syrianus wrote on the *Timaeus*, as Diehl (vol. III, index, s.v. Syrianus) suggests, or to one on the *Statesman*.

The words **within its own limits –** by these words [he shows] the mutual replacement (*antimetastasis*) of its parts. For it is not required that anything else be displaced in order for its own movement to take place, but rather it gives way to itself (*parachôrein*) and takes its own place. As a result, it is moved **within its own limits** by virtue of the motion of its parts in this process of reciprocal replacement. Therefore you have through the word **uniformly** the property of being everlasting; through the words **in the same place** that which is unchanging; and through the words **within its own limits** the form of change. From all of these things one can see that circular motion is ceaseless, since the thing remains in the same place and its motion is accomplished through the process of the parts giving way to one another. Since circular motion has this character, it is clear that it is most similar to intellect: intellect cognizes eternally and it has been founded over the same order. It is also the case that all the intellectual objects in it are at the maximal level of activity (*energêtikôtatos*) and possess a waking life (*zôê agrypnos*). This then is clear.

This aspect of Plato's discussion might be justly deemed to be amazing – that when he is talking about the being (*ousia*) of the universe, he models it on the Intelligible Living Being, but now when he holds forth concerning its motion, he brings the similarity back up to Intellect. In doing so he provides us with the proportion between them: as the intelligible has the status (*logos*) of being, so intellect has the status of activity. He said that the universe is spherical in shape, but nonetheless **97** here has assigned to it movement in a circle and turning around. This is because it seems to be moved in a circle with respect to the largest circle in it.[314] But he has added the words **turning round and round** for the sake of accuracy, since a cylinder is also moved in a circle when it is rolled. He also says that the [other] **six motions** are taken away from the universe, for the circular motion is a property most distinctive to it, since forward <and backward> motion belongs to the stars <and the planets>.[315] The cosmos is thus really something that doesn't wander around (*ontôs aplanês*), not only because the motion of its highest parts[316] is of this sort, but because it is moved through a motion that is single and simple.

[314] Perhaps Proclus has in mind the circular motion of the equator (cf. Cleomedes, 102.4). Every plane that passes through the centre of a sphere describes a circle of equal diameter on the circumference. In that sense, there is no single greatest circle in the sphere.

[315] Accepting Kroll's supplement for a lacuna at 97.7: ἰδιώτατον γὰρ ἐπ' αὐτοῦ τοῦτί ἐστιν, ἐπεὶ τοῖς τε ἄστροις ὑπάρχει καὶ <τοῖς πλάνησι τὸ ὄπισθεν καὶ> τὸ ἔμπροσθεν.

[316] Festugière supposes that Proclus has in mind here the pole which remains fixed, cf. 75.25–7 above.

It is also necessary to pay attention to this: how it is that the form of motion [i.e. the inerrant kind] that belongs to the most important [part] of the universe was said to have been given to it by the Father as something fitting to the whole cosmos. For all the others have a share in the circular motion of the cosmos. And it is true that the inerrant (*aplanês*) character of this motion is clearer in some cases, but more obscure in others. For example, the streams that flow beneath the earth are carried along in a disorderly manner and are said in particular to be wandering in various ways at different times. But the sublunary elements which are moved from here to there naturally partake to a lesser degree of this wandering character, for it is by virtue of going from one place to another that things are said to wander. Finally there are the divine bodies in the heavens [sc. the planets] and they wander even less than the sublunary elements; for in as much as their motion occurs in respect of breadth and depth, they wander, but in so far as the motion is smooth, orderly and takes place according to a single ratio, it is a regular or inerrant motion. But the cosmos itself might be called 'inerrant' in the most proper sense because it is said not to be receptive of the reflection of the other kinds of motion. Further, if one wanted to divide the class of things that are incorporeal, the ones which have an irrational life *really* (*diapherontôs*) wander in various ways, not possessing a measure of their activities intrinsically (*aph' heautês*). The sort of soul that merely has correct opinion (*orthodoxastikê psychê*) wanders less than the irrational, though even it strays in a sense through its ignorance of the cause.[317] But further still, the extent to which the kind of soul that has scientific knowledge errs is even less than that of the soul with merely true beliefs. For in this case only the mutable form of its life makes it stray. Since it hasn't oriented itself toward one intelligible object, it comes to be in different forms at different times. Only intellect is inerrant in its essence, since it is always thinking the same thing, and is directed toward the same thing, and is active concerning the same thing. Therefore, the cosmos which imitates the intellect in its motion is plausibly said to be genuinely inerrant, being made to exhibit the same uniform revolution perpetually. And surely by virtue of being moved in *this* fashion, it is in no way necessary for it to have feet added to it or generally speaking any sort of organs for movement. For this reason, the universe came to be **without feet or legs**. The theologians who want to indicate this to us somehow have customarily called the creator of body 'the lame

[317] Proclus here alludes to the discussion of straying statues and correct opinion in *Meno* 97e. There knowledge is tentatively distinguished from correct opinion by virtue of the fact that the former, but not the latter, has an account of the cause – an *aitias logismos*. The adjective *orthodoxastikos* is a late Neoplatonic neologism.

god' (*Il.* 1.607). And further to this, when the gods laugh at him with unquenchable laughter (*Il.* 1.599) he indicates by this laughter that their providence has been made to rule ceaselessly among the things in the cosmos.[318]

All this then being the plan devised by the god who exists eternally for the god who will at some time be, he made it smooth and even all over, at equal distance from the centre, a whole and complete body which is itself composed from perfect bodies. (*Tim.* 34a3–8)

D. Theoria

In an imitation of the one intellect and the kind of thought that encompasses wholes in one thing, the account draws everything to the same [point] and brings everything together in a single summation – the making of the corporeal composite. So it is necessary now for us to recollect what has been said earlier. Certainly it was said that when the elements were harmonized through proportion, all things were received into the cosmos; and that the universe became a whole composed out of wholes (32c); and that it was spherical and smooth (33b); and that it possesses knowledge of itself and moves within its own limits (34a). These things having been said, it is clear, on the one hand, that the entire cosmos itself is assimilated to the All-perfect Living Being and, on the other, that its general arrangement proceeds in correspondence with (*ana logon*) secondary and tertiary causes. First, we have the number of the elements and the bond which unifies them through proportion, and this happens by virtue of 'an intangible substance lacking colour or shape' (*Phdr.* 247c6), for number is present up there (*ekei*). Then we have the first wholeness which was arranged from the wholeness of all the elements corresponding to the intellective wholeness. Then there was the making of the sphere in relation to the intellective shape. Then the self-sufficiency, intellective motion and revolution in the same place which correspond to the god who ingests all his offspring (II. 93.25). Then there is the ensoulment which relates to the life-giving cause. Finally there is the granting to it of intellect (*to ennoun*) which corresponds to the demiurgic intellect. Though all things proceed from this cause, they nonetheless also proceed from what is prior to this, but it happens by a different proportion. The stronger things are the causes of all the things of which the secondary things are also causes, but

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[318] By 'theologists' Proclus probably means allegorical interpreters of Homer. For Proclus' own reading of these lines from Homer, see *in Tim.* II. 27.24 and *in Remp.* I. 126.5

the secondary things are the causes of fewer things than the higher principles are.[319] Now this is so even in the case of the Demiurge himself: in as much as he is possessed of intellect (*ennous*), he makes all things intellectual (*ennoa*); but in as much as he is being, he is the father of all things which are corporeal and incorporeal; and finally in so far as he is god, he establishes matter itself. Thus in the words in the lemma Plato has made a summary statement of everything which is present in the universe from the intellective god. These are the things that pertain to the general meaning of the passage. Let us now examine the truth about each of the individual things that are said.

E. Lexis

The words **all this then** require you to consider in one the whole cause of what is corporeal and to know the division of its forms. For the wholeness has been assimilated to one thing and the shape to another and the movement to yet another. While the word **this** points to the unification, the word **all** indicates the number of causes.

What is more, the words **[the god] who exists eternally** simultaneously make both the essence and the intuitive thought of the Demiurge eternal (*aiônios*) and it is on account of this that the cosmos is everlasting (*aïdios*). It is also necessary to consider these two points in conjunction – how by arranging the Demiurge among the things that exist always (*aei*) Plato assigns him a position in the eternal order, so it turns out that the Demiurge couldn't count as a soul. For in the *Laws* (904a) he says that soul is immortal and indestructible, but not eternal, using those very words.[320] So it seems that all those who suppose that the Demiurge is a soul are ignorant of the difference between what is indestructible and what is eternal. Finally, the idea of the **plan** of the Demiurge signifies what is divided or carried out in steps.

[319] In the mechanics of procession the causes that operate at the highest levels of reality by generating further beings which, in turn, cause effects lower down also "reach down" to the lowest levels and cause the very same things that their effects cause. There is thus a sort of over-determination of all the lowest levels of reality by levels higher. See *ET* 56.

[320] 'The combination of body and soul, while not an eternal creation like the gods sanctioned by law, is nevertheless indestructible (because living beings could never have been created if one of these two constituent factors had been destroyed)' (trans. Saunders). As Saunders notes, Plato's intentions in this passage are not at all clear. Proclus seems to mine it solely for the claim that soul is not *aiônios*, leaving aside the implications for the other factor in living beings. The same use is made of the passage at I. 235.17, II. 125.9, 148.30, and III. 59.12.

Now to move on to the next clause, the words **[the god] who will at some time be** are not significant of a temporal beginning of the cosmos, as Atticus thought.[321] Rather it signifies that the cosmos has the kind of being that has been proclaimed along with time,[322] for time was generated simultaneously with the heavens (38b) and it is both the case that the cosmos is enmeshed in time (*enchronos*) and that time is enmeshed with the cosmos (*encosmios*). They have been brought forth with one another and established together by a single creative act. Therefore this time that is mentioned in the lemma is not a *part* of time but rather time as a whole, in as much as it is something projected toward the being that always is. The latter is really always (*ontôs aei*), but the temporal 'always' is really a 'some time' (*pote*) in relation to what is eternal (*to aiônion*). It's like the case of the being in the generated mode (*to genêtôs on*) which counts as non-being (*mê on*) [when considered] in relation to being in the intelligible mode (*to noêtôs on*). Suppose that the cosmos exists through all the time there is. Nonetheless its being has come into existence and it always exists in some part of time, and this is a 'when' and not simultaneously in the whole of time, but always some particular time. And while that which is eternal always exists in the whole span of eternity, that which is enmeshed in time always exists at some point in time, now at one time, now at another. So this is plausibly called [the god] **who will at some time be** in relation to the god who always is, for in relation to the latter which is intellectual, the former god is sensible. Therefore, that which is the object of sense perception always comes to be, and this happens at some time. For that which is sensible has being in a divisible way, always being born of the emanation from the being that always is. For since it has its limitless capacity for being from an external source, as we said earlier (I. 279.7), and since the capacity that it has at any point is thus limited, then by virtue of this fact it *always-is* by *always-receiving*, having the unlimited capacity to be enumerated. It is clear that by being limited it is *at some time*, and as a result of this being at some time, it is always in the process of being provided with being, and through the unceasing provision of this gift it is *always becoming*. Since by virtue of its own nature, it is 'at some time' and has a sort of second-hand (*episkeuastês*) immortality, as he says in the *Statesman* (270a), it has its being in becoming. On account of this, it does not participate in the whole of time all at once, but rather exists at some time, doing this again and again. And

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[321] =fr. 29 (des Places).

[322] 100.2–4, ὅτι τὴν οὐσίαν ἔχει τῷ χρόνῳ συνεζευγμένην· χρόνος γὰρ ἅμα οὐρανῷ γέγονε, καὶ ὅ τε κόσμος ἔγχρονος καὶ ὁ χρόνος ἐγκόσμιος. A nice way to put it. This terminology does not seem to be attested anywhere else in Proclus or the other philosophical authors.

since it is among the things that come to be, it doesn't exist without being extended.

[This is how the matter stands] unless perhaps Plato signifies the whole of time with the word 'some time', for compared to the limitless eternity, the progress of time is 'some time' and the whole of time has the same status (*logos*) in relation to eternity that a part of time has in relation to the whole of time. But if you like, we can look at what Plato says in a different way. Since Plato is presently putting together the corporeal cosmos, but has yet to establish its soul and intellect in words, **the god who will at some time be** refers to the fact that the establishing of the cosmos in words proceeds a part at a time. For the god institutes in a composite manner (*athroôs*) both the parts and the whole, but the written account divides the things that have been set up together and provides an engendering of what is ungenerated and introduces temporal divisions among things that are everlasting. Therefore the words 'the god who will at some time be' clearly refers to what is constructed by the discourse and it is through this that there is division and then the putting together. For the Pythagorean Timaeus actually indicates this very same thing to those who are able to grasp the point when he says 'before the heaven was born *in words* (*logôi*), there were the Forms, matter and the demiurgic god'.[323] That he contrives the coming to be of the heaven in words he has made clear by what is explicitly said.

Moving along then, as noted earlier (79.17 ff.), the words 'smooth' and 'even' in the phrase **he made it smooth and even** evince the single comprehension of all things within the cosmos and its highest receptivity with respect to participation in the divine soul. The words **at equal distance from the centre** delineate the defining property of the spherical shape, for in the case of this shape [the surface] is at equal distance [from the centre] in all dimensions. But the words **a whole and complete body composed of complete bodies** set up the highest similarity between the cosmos and the All-perfect Living Being (for the latter was in every way complete) and toward the Demiurge too; for as he is the father of fathers[324] and 'supreme ruler' (*Iliad* 8.31), so too the cosmos is

[323] Proclus refers here to the Pythagorean forgery of the work of Timaeus of Locris from which Plato's *Timaeus* was thought to be drawn. His reading of this passage from ps.-Timaeus is not the most natural one. The text at 94c reads: Πρὶν ὧν ὠρανὸν λόγῳ γενέσθαι ἥστην ἰδέα τε καὶ ὕλα καὶ ὁ θεὸς δαμιουργὸς τῶ βελτίονος. Tobin (1985) translates this as I would, 'According to this account then, before the heaven came to be, the idea and matter, as well as the god who is the fashioner of the better, already existed.'

[324] Perhaps an allusion to *Or. Chald.* 94 (Majercik = *in Tim.* I. 318.17–18) where the phrase 'father of gods and men' occurs.

the most complete of all the things that are complete and the one among the class of whole things that is maximally whole.

You might also say that Plato says that the cosmos is **smooth**[325] in as much as it requires none of the organs of movement, nourishment or sense – for this has been shown just previously – but calls it something **at equal distance from the centre** in so far as it has a spherical shape. And he uses the words **whole and complete** in as much as it is perfect (*pantelês*) and nothing has been left outside it – for this applies to what is strictly whole and complete. From the phrase **out of complete bodies** we may infer that it is a composite of the four elements. And from the fact that he says that it is **a body** in the singular that is so composed, we may see that it is one of a kind (*monogenês*). And thus beginning from the uniqueness of the cosmos and proceeding as far as its completeness, Plato has reverted again to this uniqueness through what has just been said. In this way he imitates the procession of the cosmos from its paradigm and its complete reversion to it.

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[325] Proclus' text has 'complete' (τέλειον) rather than 'smooth' (λεῖον). But, as Festugière points out, Proclus here seems to go back to the middle of the lemma and provide an alternative explanation of each phrase. His second possible gloss on 'complete' comes in the next lines, so that initially suggests that there has been a slip of the pen here. Moreover, it seems to me odd even by Proclus' standards to explain the world's completeness through the organs it lacks!

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English–Greek glossary

accidentally or *per accidens*	*kata symbebêkos*	κατὰ συμβεβηκός
account	*logos*	λόγος
activity	*energeia*	ἐνέργεια
actuality	*energeia*	ἐνέργεια
aether	*aether*	αἰθήρ
aetherial	*aitheriôdês*	αἰθεριώδης
affection	*pathos*	πάθος
aim	*skopos*	σκοπός
air	*aêr*	αήρ
akin to	*syngenês*	συγγενής
all things	*panta*	πάντα
allot	*lanchanein*	λανχάνειν
all-perfect	*panteleios*	παντέλειος
always or continuously	*aei*	ἀεί
animate	*empnein*	ἐμπνεῖν
animation	*psychôsis*	ψύχωσις
antecedently comprehend (effects in their causes)	*prolambanein*	προλαμβάνειν
antecedently establish	*proÿparchein*	προϋπάρχειν
appearances	*phainomena*	φαινόμενα
appropriate	*oikeios*	οἰκεῖος
argument	*logos*	λόγος
assimilate or make like	*aphomoioun*	ἀφομοιοῦν
astronomy	*astronomia*	ἀστρονομία
bad or evil	*kakos*	κακός
be affected or undergo	*paschein*	πάσχειν
beautiful or fine	*kalos*	καλός
beautify	*kosmein*	κοσμεῖν
being	*ousia*	οὐσία
beings	*onta*	ὄντα
bind	*dein*	δεῖν
blessed	*spoudaios*	σπουδαῖος
body	*sôma*	σῶμα

body, make a	*sômatourgein*	σωματουργεῖν
body-making	*sômatourgikos*	σωματουργικός
bond	*desmos*	δεσμός
boundary	*horos*	ὅρος
capable of discursive reason	*dianoêtikos*	διανοητικός
category	*taxis*	τάξις
cause	*aitia*	αἰτία
celebrate	*anymnein*	ἀνυμνεῖν
celestially	*ouraniôs*	οὐρανίως
chance	*tychê*	τύχη
change	*kinêsis*	κίνησις
change	*metabolê*	μεταβολή
changeless	*ametabatos*	ἀμετάβατος
characterize	*charaktêrizein*	χαρακτηρίζειν
circle	*kyklos*	κύκλος
clearly	*saphôs*	σαφῶς
cognition	*gnôsis*	γνῶσις
come into being or become	*gignesthai*	γίγνεσθαι
commune with	*koinônein*	κοινωνεῖν
complete or make perfect	*apotelein*	ἀποτελεῖν
complete or perfect (adj.)	*teleios*	τέλειος
composite (noun)	*systêma*	σύστημα
composite (adj.)	*synthetos*	σύνθετος
composition	*systasis*	σύστασις
compounded	*synkeimenos*	συγκείμενος
conceive	*epinoein*	ἐπινοεῖν
conception	*ennoia*	ἔννοια
conception	*epibolê*	ἐπιβολή
conception	*dianoêma*	διανόημα
conflict	*machê*	μάχη
conjectural	*eikastikos*	εἰκαστικός
conjecture	*eikazein*	εἰκάζειν
connate	*symphyês*	συμφυής
consciousness	*synaisthêsis*	συναίσθησις
contemplation	*theôria*	θεωρία
conversion (logic)	*antistrophê*	ἀντιστροφή
convincingness	*pistis*	πίστις
copy or replica	*eidôlon*	εἴδωλον
corporeal	*sômatikos*	σωματικός
corporeal	*sômatoeidês*	σωματοειδής
cosmos	*kosmos*	κόσμος

coupled series	*systoichia*	συστοιχία
craft	*technê*	τέχνη
craftsman	*dêmiourgos*	δημιουργός
create	*apogennan*	ἀπογεννᾶν
create	*dêmiourgein*	δημιουργεῖν
creation	*dêmiourgia*	δημιουργία
creation	*kosmopoiia*	κοσμοποιία
creation	*poiêsis*	ποίησις
creator	*gennôn*	γεννῶν
Creator	*ho poiêtês*	ὁ ποιητής
daemon	*daimôn*	δαίμων
decision	*boulêsis*	βούλησις
definiendum	*horistos*	ὁριστός
defining or distinctive	*idios*	ἴδιος
definition	*horismos*	ὁρισμός
decad	*dekas*	δεκάς
Demiurge	*Dêmiourgos*	δημιουργός
demonstrate	*deiknynai*	δεικνύναι
demonstrate	*apodeiknynai*	ἀποδεικνύναι
denominate or call	*onomazein*	ὀνομάζειν
dependent upon, be	*artasthai*	ἀρτᾶσθαι (pass.)
depth	*bathos*	βάθος
descend	*katabainein*	καταβαίνειν
descent (of the soul)	*kathodos*	κάθοδος
destruction	*lysis*	λύσις
destruction	*phthora*	φθορά
destructive of	*phthartikos*	φθαρτικός
deterioration	*hyphesis*	ὕφεσις
determine or decide	*boulesthai*	βούλεσθαι
Difference (five greatest kinds, from *Sophist*)	*heterotês*	ἑτερότης
discursive thought	*dianoia*	διάνοια
disorder	*ataxia*	ἀταξία
disorderly	*ataktos*	ἄτακτος
dissolve or destroy	*lyein*	λύειν
distinguish	*diorizein*	διορίζειν
divided	*diairoumenos*	διαιρούμενος
divided or divisible	*meristos*	μεριστός
divine	*theios*	θεῖος
division	*diairesis*	διαίρεσις
doctrine	*theôria*	θεωρία

earth	*gê*	γῆ
efficacious	*drastêrios*	δραστήριος
element	*stoicheion*	στοιχεῖον
empyrian (*Or. Chald.*)	*empyrios*	ἐμπύριος
encosmic	*enkosmios*	ἐγκόσμιος
endowed with intellect	*ennous*	ἔννους
engender	*gennan*	γεννᾶν
enmattered	*enylos*	ἔνυλος
enmattered fully	*enylotatos*	ἐνυλότατος
ensouled	*empsychos*	ἔμψυχος
entirely complete	*autotelês*	αὐτοτελής
equality	*isotês*	ἰσότης
essence or essential nature	*ousia*	οὐσία
eternal	*aiônios*	αἰώνιος
everlasting	*aïdios*	ἀίδιος
exact	*akribês*	ἀκριβής
exist	*hyphistanai*	ὑφιστάναι
existence	*hyparxis*	ὕπαρξις
existence	*hypostasis*	ὑποστασις
extend	*ekteinein*	ἐκτείνειν
extension	*ektasis*	ἐκτασις
extreme terms in a syllogism or math. proportion	*akra*	ἄκρα
fabrication	*poiêsis*	ποίησις
facts	*pragmata*	πράγματα
false	*pseudos*	ψεῦδος
fashion	*dêmiourgein*	δημιουργεῖν
father	*patêr*	πατήρ
fiery	*pyrios*	πύριος
fill out with essential parts	*symplêroun*	συμπληροῦν
fire	*pyr*	πῦρ
font	*pêgê*	πηγή
force	*bia*	βία
force	*rhopê*	ῥοπή
foreshadow	*proÿphistanai*	προΰφιστάναι
Form	*idea*	ἰδέα
form of subsistence	*hypostasis*	ὑπόστασις
formation	*taxis*	τάξις
formless	*aneideos*	ἀνείδεος
Forms	*eidê*	εἴδη
foundation	*hypobathron*	ὑπόβαθρον
foundation	*hypostasis*	ὑπόστασις

founded in, to be	*hidryein*	ἱδρύειν
free from age	*agêraos*	ἀγήραος
friendship	*philia*	φιλία
function	*ergon*	ἔργον
fundamental principle	*axiôma*	ἀξίωμα
generated	*genêtos*	γενητός
generation of the soul	*psychogonia*	ψυχογονία
generation or becoming	*genesis*	γένεσις
generation-producing	*genesiourgos*	γενεσιουργός
generative	*gennêtikos*	γεννητικός
genuinely	*ontôs*	ὄντως
genus	*genos*	γένος
gift	*dôron*	δῶρον
giving soul to	*psychôsis*	ψύχωσις
glimmer	*indalma*	ἴνδαλμα
goal	*telos*	τέλος
god	*theos*	θεός
good	*agathos*	ἀγαθός
growth	*auxêsis*	αὔξησις
guardian	*phylax*	φύλαξ
harmonious	*enarmonios*	ἐναρμόνιος
harmonize	*enarmozein*	ἐναρμόζειν
have priority	*proÿphistanai*	προϋφιστάναι
having the same rank	*homostoichos*	ὁμόστοιχος
heaven	*ouranos*	οὐρανός
heavenly	*ouranios*	οὐράνιος
heavens (the)	*ta ourania*	τὰ οὐράνια
henads	*henades*	ἑνάδες
hidden	*kryphios*	κρύφιος
high-mindedness	*hypsêlonoia*	ὑψηλονοία
homogeneous	*homogenês*	ὁμογενής
homoiomerous or having similar parts	*homoiomerês*	ὁμοιομερής
hypercosmic	*hypercosmios*	ὑπερκόσμιος
hypostasis	*hypostasis*	ὑπόστασις
hypothesis or basic principle	*hypothesis*	ὑπόθεσις
iconically	*eikonikôs*	εἰκονικῶς
image	*agalma*	ἄγαλμα
image	*eidôlon*	εἴδωλον
image	*eikôn*	εἰκών

imagination	*phantasia*	φαντασία
imitation	*mimêsis*	μίμησις
immaculate	*achrantos*	ἄχραντος
immanent	*enkosmios*	ἐγκόσμιος
immanent in, be	*enyparchein*	ἐνυπάρχειν
immaterial (opp. enmattered)	*aÿlos*	ἄϋλος
immobile	*akinêtos*	ἀκίνητος
immobile or not easily moved	*dyskinêtos*	δυσκίνητος
impartible	*ameristos*	ἀμέριστος
impassive or free from affection	*apathês*	ἀπαθής
implacable	*ameiliktos*	ἀμειλίκτος
impossible	*adynatos*	ἀδύνατος
incapable	*adynatos*	ἀδύνατος
incline	*neuein*	νεύειν
incomplete or imperfect	*atelês*	ἀτελής
inconceivable	*anepinoêtos*	ἀνεπινόητος
incorporeal	*asômatos*	ἀσώματος
indestructible	*aphthartos*	ἄφθαρτος
indicate	*dêloun*	δηλοῦν
indicate	*epideiknynai*	ἐπιδεικνύναι
indissoluble	*alytos*	ἄλυτος
indistinct	*amydros*	ἀμυδρός
individual souls	*merikai psychai*	μερικαὶ ψυχαί
individuals	*atoma*	ἄτομα
individuals	*hekasta*	ἕκαστα
indivisible	*adiairetos*	ἀδιαίρετος
ineffable	*arrêtos*	ἄρρητος
infimae species	*atoma eidê*	ἄτομα εἴδη
initially	*prôtôs*	πρώτως
innate	*autophyês*	αὐτοφυής
inseparable or not proceeding out	*aneikphoitêtos*	ἀνεκφοίτητος
inseparable	*achôristos*	ἀχώριστος
insight	*gnôsis*	γνῶσις
inspired manner, in an	*daimôniôs*	δαιμωνίως
intangible	*anaphês*	ἀναφής
intellect	*nous*	νοῦς
intellectual or intellective	*noeros*	νοερός
intelligible	*noêtos*	νοητός
intelligized entities	*nooumena*	νοούμενα
intermediates	*mesa*	μέσα
interventionist	*drastêrios*	δραστήριος
introduce	*paragein*	παράγειν

introduce	*protassein*	προτάσσειν
intuitive thought	*noêsis*	νόησις
investigate	*zêtein*	ζητεῖν
investigation of problems	*theôria*	θεωρία
irrational	*alogos*	ἄλογος
itself by itself, or in itself	*auto kath' hauto*	αὐτὸ καθ' αὑτό
itself through itself	*auto hyph' hauto*	αὐτὸ ὑφ' αὑτο
jealousy	*phthonos*	φθόνος
judgement	*doxa*	δόξα
judgement	*katalêpsis*	κατάληψις
knowledge	*gnôsis*	γνῶσις
lack of symmetry	*asymmetria*	ἀσυμμετρία
last (of a series)	*eschatos*	ἔσχατος
level	*platos*	πλάτος
life	*zôê*	ζωή
life-engendering	*zôiogonikos*	ζῳογονικός
life-giving	*zôtikos*	ζωτικός
light	*phôs*	φῶς
limit	*peras*	πέρας
link to	*exaptein*	ἐξάπτειν
Living Being itself	*autozôion*	αὐτοζῷον
living thing	*zôion*	ζῷον
love	*erôs*	ἔρως
luminous	*augoeidês*	αὐγοειδής
luminous	*phôtoeidês*	φωτοειδής
magnitude	*megethos*	μέγεθος
maintain	*synechein*	συνέχειν
make	*apotelein*	ἀποτελεῖν
manifest	*ekphainein*	ἐκφαίνειν
manner	*tropos*	τρόπος
manufacture	*kosmourgein*	κοσμουργεῖν
mark or impression	*typos*	τύπος
mathematical terms that are rational in relation to one another	*rhêta*	ῥητά
matter	*hylê*	ὕλη
measure	*metron*	μέτρον
middle terms (math. logic)	*mesa*	μέσα
mixture	*krasis*	κρᾶσις
mixture	*mixis*	μῖξις

monad	*monas*	μονάς
moon	*mênê*	μήνη
Moon	*selênê*	σελήνη
mortal	*thnêtos*	θνητός
mother	*mêtêr*	μήτηρ
Motion (five greatest kinds, from *Sophist*)	*kinêsis*	κίνησις
motionless	*akinêtos*	ἀκίνητος
motivate	*egeirein*	ἐγείρειν
musical value	*dynamis*	δύναμις
mutable	*metabatikos*	μεταβατικός
myth	*mythos*	μῦθος
mythical	*mythikos*	μυθικός
native	*oikeios*	οἰκεῖος
natural	*kata physin*	κατὰ φύσιν
naturally, by nature	*pephyke*	πέφυκε
nature	*physis*	φύσις
Necessity	*anankê*	ἀνάγκη (ἡ)
nourish	*auxein*	αὔξειν
number	*arithmos*	ἀριθμός
object of desire	*ephetos*	ἐφετός
observe	*katamanthanein*	καταμανθάνειν
occurrence	*gignomenon*	γιγνόμενον
One, the	*to hen*	τὸ ἕν
one of a kind	*monogenês*	μονογενής
One-Being, the (from second hypothesis of *Parm.*)	*to hen on*	τὸ ἓν ὄν
opinable	*doxastos*	δοξαστός
opinion	*doxa*	δόξα
opinion-based	*doxastikos*	δοξαστικός
opposites	*enantia*	ἐναντία
order	*taxis*	τάξις
order, to	*diakosmein*	διακοσμεῖν
ordered beauty	*kosmêsis*	κόσμησις
ordering of things	*diakosmêsis*	διακόσμησις
orderly or inerrant	*aplanês*	ἀπλανής
organic	*organikos*	ὀργανικός
originary form	*archoeides*	ἀρχοειδές
painful	*lupêros*	λυπηρός
paradigm	*paradeigma*	παράδειγμα

part	*meros*	μέρος
part	*morion*	μόριον
partial	*merikos*	μερικός
participate in	*metechein*	μετέχειν
participated intellect	*methektos nous*	μεθεκτὸς νοῦς
participated things	*metechomena*	μετεχόμενα
participation	*methexis*	μέθεξις
participation, through	*kata methexin*	κατὰ μέθεξιν
particulars	*kath hekasta*	καθ' ἕκαστα
particulars	*merika*	μερικά
passive	*pathêtos*	παθητός
passive manner, in a	*pathêtikôs*	παθητικῶς
peculiar characteristics	*idiotês*	ἰδιότης
perfective	*telesiourgos*	τελεσιουργός
perishable	*apollymenos*	ἀπολλύμενος
perishable	*phthartos*	φθαρτός
pervade	*diêkein*	διήκειν
pervasive	*pephoitêkos*	πεφοιτηκός
philosopher of nature	*physiologos*	φυσιόλογος
phrase	*lexis*	λέξις
physical or natural	*physikos*	φυσικός
physical numbers	*arithmoi hoi physikoi*	ἀριθμοὶ οἱ φυσικοί
physical theory	*physiologia*	φυσιολογία
physically	*physikôs*	φυσικῶς
place	*topos*	τόπος
place	*chôra*	χώρα
plainly	*enargôs*	ἐναργῶς
plausibly	*eikotôs*	εἰκότως
plural in form	*polyeidês*	πολυειδής
plurality	*plêthos*	πλῆθος
plurality, make a	*plêthyein*	πληθύειν
pneuma	*pneuma*	πνεῦμα
postulate	*hypotithenai*	ὑποτιθέναι
power (opp. *ousia* and *energeia*)	*dynamis*	δύναμις
predominate	*epikratein*	ἐπικρατεῖν
pre-establish	*proïdryein*	προϊδρύειν
pre-exist	*proÿparchein*	προϋπάρχειν
preliminary way, in a	*kat' aitian*	κατ' αἰτίαν
preserve	*sôizein*	σῴζειν
primal way, in a	*archêgikôs*	ἀρχηγικῶς
primarily	*prôtôs*	πρώτως
principle or source	*archê*	ἀρχή

proceed	*proïenai*	προ-ιέναι
proceed	*proërchesthai*	προ-έρχεσθαι
procession	*proödos*	πρόοδος
produce	*apogennan*	ἀπογεννᾶν
produce	*paragein*	παράγειν
productive	*gonimos*	γόνιμος
productive	*poiêtikos*	ποιητικός
products	*engona*	ἔγγονά
projection	*eklampsis*	ἔκλαμψις
proper	*oikeios*	οἰκεῖος
properly, most	*kyriôtatôs*	κυριώτατως
proportion	*analogia*	ἀναλογία
providence	*pronoia*	πρόνοια
psychic	*psychikos*	ψυχικός
pure	*amigês*	ἀμιγής
pure	*eilikrinês*	εἰλικρινής
purification	*katharsis*	κάθαρσις
purify	*kathareuein*	καθαρεύειν
puzzle or problem case	*aporia*	ἀπορία
qualitative nature	*poiotês*	ποιότης
quality	*poiotês*	ποιότης
quality or property	*dynamis*	δύναμις
rank	*taxis*	τάξις
ratio	*logos*	λόγος
realities	*onta*	ὄντα
really	*ontôs*	ὄντως
realm	*platos*	πλάτος
reason	*logos*	λόγος
receptacle	*hypodochê*	ὑποδοχή
receptivity	*epitêdeiotês*	ἐπιτηδειότης
relation	*schesis*	σχέσις
remain (metaphysics of emanation)	*menein*	μένειν
representation	*agalma*	ἄγαλμα
resistance	*antitypos*	ἀντίτυπος
Rest (five greatest kinds, from *Sophist*)	*stasis*	στάσις
reversion (metaphysics of emanation)	*epistrophê*	ἐπιστροφή
revert	*strephein*	στρέφειν
revert upon	*epistrephein*	ἐπιστρέφειν
rule	*horos*	ὅρος
Sameness (five greatest kinds, from *Sophist*)	*tautotês*	ταυτότης

saying	*lexis*	λέξις
scientific knowledge	*epistêmê*	ἐπιστήμη
seed	*sperma*	σπέρμα
self-generated (*Or. Chald.*)	*autogenethlos*	αὐτογένεθλος
self-motion	*autokinêsis*	αὐτοκίνησις
self-mover	*autokinêtos*	αυτοκίνητος
self-sufficiency	*autarkeia*	αὐτάρκεια
self-sufficient	*autarkês*	αὐτάρκης
sense object(s)	*aisthêton(ta)*	αἰσθητόν(τά)
sense organ	*aisthêtêrion*	αἰσθητήριον
series	*heirmos*	εἱρμός
series	*seira*	σειρά
shape	*schêma*	σχῆμα
share in	*koinônein*	κοινωνεῖν
show	*deiknynai*	δεικνύναι
signify	*sêmainein*	σημαίνειν
solid (noun)	*ongkos*	ὄγκος
solid (adj.)	*stereos*	στερεός
soul	*psychê*	ψυχή
source	*pêgê*	πηγή
space	*chôra*	χώρα
sphere	*sphaira*	σφαῖρα
spherical	*sphairoeidês*	σφαιροειδής
spontaneous	*automatos*	αὐτόματος
star	*astêr*	ἀστήρ
state	*hexis*	ἕξις
strictly	*kyriôs*	κυρίως
subject to generation	*genesiourgos*	γενεσιουργός
subsist	*hyphistanai*	ὑφιστάναι
substance	*ousia*	οὐσία
substantial	*ousiôdês*	οὐσιώδης
substrate	*hypokeimenon*	ὑποκείμενον
suitably	*eikotôs*	εἰκότως
sun	*hêlios*	ἥλιος
supplementary requirement	*synaitia*	συναιτία
supposition	*doxa*	δόξα
symbol or token	*symbolon*	σύμβολον
symbolically	*symbolikôs*	συμβολικῶς
sympathy	*sympatheia*	συμπάθεια
tangible	*haptos*	ἁπτός
target	*skopos*	σκοπός

temporal	*kata chronon*	κατὰ χρόνον
tenuousness	*leptomereia*	λεπτομέρεια
term or name	*onoma*	ὄνομα
tetrad	*tetras*	τετράς
theologians (Orphics or Oracles)	*theologoi*	θεολόγοι
theory	*theôria*	θεωρία
things	*pragmata*	πράγματα
throughout eternity	*diaiônios*	διαιώνιος
totality	*holos*	ὅλος
touch (sense of)	*haphê*	ἁφή
trace back	*anagein*	ἀνάγειν
transcend	*exartan*	ἐξαρτᾶν
transcendent	*exêirêmenos*	ἐξῃρημένος
transform	*exallattein*	ἐξαλλάττειν
transition	*metabasis*	μετάβασις
triad	*trias*	τριάς
Truth	*alêtheia*	ἀλήθεια
underlying subject	*hypokeimenon*	ὑποκείμενον
understand	*katamanthanein*	καταμανθάνειν
unextended	*adiastatos*	ἀδιάστατος
ungenerated	*agenêtos*	ἀγένητος
unified manner, in	*hênômenôs*	ἡνωμένως
uniform	*monoeidês*	μονοειδής
uniform manner, in	*henoeidôs*	ἑνοειδῶς
unique things	*monadika*	μοναδικά
uniqueness	*monotês*	μονότης
united	*hênômenos*	ἡνωμένος
unities	*henades*	ἑνάδες
universal (adj. e.g. Universal Nature)	*holos*	ὅλος
universal (n. common property)	*to katholou*	τὸ καθόλου
universe	*to pan*	τὸ πᾶν
unlimited	*apeiros*	ἄπειρος
unmixed	*amigês*	ἀμιγής
unparticipated	*amethektos*	ἀμέθεκτος
unparticipated intellect	*amethektos nous*	ἀμέθεκτος νοῦς
up there (among the intelligibles)	*ekei*	ἐκεῖ
various	*pantoios*	παντοῖος
vehicle	*ochêma*	ὄχημα
very first	*prôtistos*	πρώτιστος

violence	*bia*	βία
visible	*horatos*	ὁρατός
visible things	*horata*	ὁρατά
void	*to kenon*	τὸ κενόν
volume	*onkos*	ὄγκος
warm	*thermos*	θερμός
water	*hydôr*	ὕδωρ
weakness	*astheneia*	ἀσθένεια
whole	*holos*	ὅλος
whole, in the manner of a	*holikôs*	ὁλικῶς
wholeness	*holotês*	ὁλότης
wisdom	*phronêsis*	φρόνησις
without a medium or middle term	*amesôs*	ἀμέσως
words	*lexis*	λέξις
work	*ergon*	ἔργον

Greek word index

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General index

The primary vehicle for finding material within the translation is intended to be the word index and glossary; from within the translation this index will only include (i) topics from the introductory section and (ii) parenthetic references to works other than the *Timaeus* thereafter. It is designed chiefly to help readers locate names, passages, and topics discussed in the introduction and notes.