

Stoic Unformed Substance and Old Academic Ontology

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PhD.

I, Martin Skipper, confirm that the work presented in this thesis is my own. Where information has been derived from other sources I confirm that this has been indicated in the thesis.

Abstract:

This thesis examines the influences on the Stoics' development of their material principle. The thesis argues that the reasons for the Stoics' conceiving of a material principle as they did actually have their origins in metaphysical speculation rather than physics.

While the natural philosophy of the Ionians, as interpreted by Aristotle and his followers, no doubt furnished the intellectual background for a persisting material substrate of all sensible change, it is in fact the concerns of Plato and his early followers with the non-sensible that exert the strongest influence on the Stoics.

The thesis examines the concepts of space and matter in the *Timaeus* ultimately rejecting this work of physics as central to the development of Stoic thought on matter. Rather it is the metaphysical doctrines of Plato and his successors, and the use they make of an incorporeal matter, that exerted the greatest influence on the Stoics and their material principle. The interpretation of Platonic metaphysics argued for in the thesis, based on the Unwritten Doctrines and the Old Academy's teachings, challenges the majority opinion of the English speaking community; and as a result offers a novel understanding of the relationship of Stoicism to Platonic metaphysics.

The thesis concludes that it is likely that the early Stoics developed their doctrine of a material substrate in the particular way they did because of the tendency in the Old Academy to simplify the doctrines of Plato. This simplifying tendency comes to a head in the early Stoics with the ultimate reduction of the Old Academic system of hypostases, making use of active and passive principles at various levels of reality, finally ending in one level of reality and a simple two principle system.

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Despite the input of all these people it goes without saying that any errors contained within these pages are entirely my own.

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Introduction:

The purpose of this thesis is two-fold: firstly to examine and explain the influence of Old Academic ontology on the early Stoics - Zeno, Cleanthes and Chrysippus - and its relationship to their particular understanding of the material principle - the *apoiou ousia*. Secondly, and in order to achieve the first aim, to re-examine Plato's late physics in light of the teachings of two of his students (Speusippus and Xenocrates) and in light of the Unwritten Doctrines as reported by Aristotle. In answering the question of what is responsible for the world's materiality and corporeality I will look at the interpretations and uses made by the Stoics' predecessors of the concept of a material principle as an "out of which". In looking at matter it is impossible to avoid discussions of the Stoics' other principle -the active, or god. The two are closely related and so while the focus of the thesis is matter there will necessarily be discussion of matter's concomitant in the analysis of Chrysippus' predecessors' philosophies and the nature of this relationship will prove key to our understanding. It will be shown that it is likely that the main influence on the Stoics for their development and characterisation of prime matter, so familiar to our minds, can be found primarily in the teachings of Speusippus and Xenocrates; hence matter, as conceived by the Stoics, will be shown to be the culmination of a legacy starting with the mathematical metaphysics of the Pythagoreans and reaching them via the incorporeal principles of Plato.

There are numerous candidates for the main influence on the Stoics' development of their two principles, the active and passive bodies that constitute the universe and all that is in it, and the relationship that holds between them: 1) The pre-Socratics, especially Heraclitus¹. This is the influence the early Stoics themselves indicated most strongly but has been convincingly challenged by Long². 2) The written teachings of Plato, especially the *Timaeus* - an influence accepted positively by Long and Sedley: "His (Chrysippus') borrowings from the *Timaeus* are obvious."³ 3) The Unwritten Doctrines and their interpretation in the Old Academy - specifically Speusippus and Xenocrates: the view to be argued for in this thesis. 4) Zeno's reported teacher at the Academy: Polemo. A position argued for strongly by Sedley

¹ Aristotle is our main source of information about the pre-Socratics but there is no reason to suppose that this was the case in the Hellenistic period. The access the Stoics had to Heraclitus' work will be discussed in chapter four.

² Long 1996a.

³ Cf. L&S vol. 1, p. 278.

in his "The Origins of Stoic God." 5) Aristotle's writings on the subject, especially the *Metaphysics* and *Physics*. This view is forcefully argued by Hahm⁴, and accepted to a lesser degree by Long⁵, but argued just as vociferously against by Sandbach⁶. There is also the suggestion of influence from the Near East and Semitic tradition, a possibility discussed by Hahm⁷ but in the end rejected through lack of evidence. I will not, therefore, entertain this possibility as it has already been sufficiently discussed and lacks any significant plausibility.

The first option, that of influence through the pre-Socratic tradition, will be discussed at the end of the thesis as, while their materialistic theories undeniably have many resonances with Stoicism, the idea of them as a significant influence on the philosophical development of Stoicism seems unlikely. Not, though, for the reasons given by Curd⁸ that neither Plato nor Aristotle paid much attention to Heraclitus, since, on the contrary, he seems to have been a strong influence on Plato's epistemology and a major driving factor behind his ontology and was certainly seen as a significant thinker by Aristotle⁹; but rather because the relationship of early Stoicism to Heraclitus is more of retrograde ascription by them of their theories onto Heraclitus in order to support their theories by appeal to venerable antiquity¹⁰. However, since "influence" does not simply mean "adoption" the discussion of pre-Socratic theories, and Heraclitus in particular, will help to place the main theme of the thesis in the context of the intellectual development of philosophy in the post-Socratic environment¹¹.

Option two, that it is primarily through the written work of Plato and especially the *Timaeus* that the Stoics' physics developed, was championed indirectly in antiquity by Antiochus of Ascalon and in modern times, as noted above, by Long and Sedley. Since the *Timaeus* was probably the most influential work on cosmology from

⁴ Hahm 1977.

⁵ Long 1998.

⁶ Sandbach 1985. On pg. 16 he draws the parallel to Xenocrates suggesting that if we possessed as much of Xenocrates as we do of Aristotle that we could show a strong connection between him and the Stoics – I do not think that we need his entire corpus to show this and his influence on the Stoics will be argued for in chapter three.

⁷ *Op cit.* p. 219. An interesting digression given Zeno's connection with the East, and Heraclitus' cf. fr. 14 D = CXV Kahn = Clement *Protrepticus* 22.2.

⁸ Curd 1993, p. 62.

⁹ Indeed in both the *Theaetetus* and *Cratylus* Heraclitus himself is spoken of favourably, and Aristotle discusses his epistemology at length as well as looking favourably upon his ethics.

¹⁰ The conclusion reached by both Curd (1993), Long (1996a) and Barnes (2002).

¹¹ Chapter four will discuss the strong similarities that exist between what we know of Heraclitus and Stoic physics. It is, in my opinion, a similarity of coincidence that once recognised brought the Stoics to Heraclitus rather than them building on his work.

antiquity through to the time of Galileo¹² a large section of this thesis will be spent examining its doctrines which are related to Plato's principles (*archai*) and its suggestion of a material principle – the elements and the Receptacle. The primary discussion of the *Timaeus* will follow a mostly traditional interpretation. It will be seen that a traditional interpretation, even allowing for such major disputes as the nature of the Receptacle and principle of motion in the pre-cosmic chaos, leaves the *Timaeus* too far removed to have played the significant and direct role looked for here in the development of the Stoics' material principle, though its doctrines concerning the world-soul will be seen to resemble the Stoics' active principle strongly and so is likely to have been an influence in this respect. Instead it will be in conjunction with other written works of Plato that the physical aspect of the *Timaeus* must be understood. The physics of the *Timaeus* will be shown to be only fully explicable by appeal to Plato's metaphysics. I will, thus, be challenging the position of Algra¹³ and Guthrie¹⁴ who see each written work of Plato as a self-contained work internally sufficient. It is at this point that those who accept Platonic influence on the early Stoa usually halt their exegesis; Long and Sedley¹⁵, Solmsen¹⁶, Lapidge¹⁷, and Longrigg¹⁸, to name but a few, all accept Platonic, and some Peripatetic, influence on the Stoics but leave it up to the written works – the direct words of Plato - to explain the relationship of Academy to Stoa.

This brings me on to option three: the Unwritten Doctrines and the first two heads of the Old Academy; Speusippus and Xenocrates. The Unwritten Doctrines have not enjoyed the favour of the academic community in the English speaking world as they have in the German. However it is one of the main contentions of this thesis that the works of Plato, and those of his successors, cannot be properly understood without recourse to these. Algra¹⁹ has two objections to the Unwritten Doctrines: 1) that the controversy surrounding them is not resolved, so that extended reference to them adds nothing to an understanding of Platonism; 2) That each dialogue of Plato stands alone as a self-contained piece of work so we do not need to appeal to "external" information to understand them, though he does not deny that knowledge of other

¹² As Van Winden (1975, pg. 1) says: "Among the dialogues of Plato none has made a greater impact upon the centuries of human thought than the *Timaeus*".

¹³ Algra 1995, p. 75.

¹⁴ Guthrie 1967-81, IV, p. 324.

¹⁵ L&S 1987.

¹⁶ Solmsen 1968-82.

¹⁷ Lapidge 1973.

¹⁸ Longrigg 1975.

¹⁹ Ibid.

dialogues (while not vital) would aid understanding of another. The second concern I take to simply be false; instead each dialogue is not a stand alone comprehensive work but merely the most basic introduction, made available to whet the appetite of young philosophers, and that the important part of the teaching was taking place in discussion²⁰. In support of this we have Plato's seventh letter, which states that written works are not the place to find knowledge²¹. If we also take into account Plato's knowledge and evident attraction to Pythagorean philosophy then there is another reason to suspect that the written works do not tell the whole story of Platonic thought²². Pythagoreanism is notorious as a mystery cult which allegedly went so far as to kill a member for "religious heresy", while I would not suggest that Plato would take such extreme action it seems to me more than likely that he too was attracted to the idea of intellectual exclusivity and elitism – publishing one's entire philosophy does not make much sense in light of that. As for the controversy surrounding the status of the Unwritten Doctrines this is really only a modern one²³. The successors to Plato: Aristotle, Speusippus and Xenocrates, all clearly took them seriously. I take both Speusippus and Xenocrates to be both in essence following

²⁰ A position dismissed by Gill (1993) but accepted by Dillon (1996, pg. 338).

²¹ "But this much I can certainly declare concerning all these writers, or prospective writers, who claim to know the subjects which I seriously study, whether as hearers of mine or of other teachers, or from their own discoveries; it is impossible, in my judgement at least, that these men should understand anything about this subject. There does not exist, *nor will there ever exist*, any treatise of mine dealing therewith...I am certain, that the best statement of these doctrines in writing or in speech *would* be my own statement" 341b-c (Trans. Bury. My italics) (cf. 341e). Although the authenticity of the letter is debateable it is among the most likely to be authentic and a any rate seems to represent Plato's thought reasonably well and so while it cannot be taken as definitive proof of his thought it can be taken as an indicator of it. Besides, the passage just quoted is supported by the *Republic* where it says that philosophy is only "for the few" (*Rep* 494a) so the exoteric works are unlikely to contain the whole truth. As Gill (1993) points out, though he rejects this position, other texts often cited in support of Plato's desire to keep some learning back are *Phaedrus* 275a6-b2 and *Republic* 533a. Gill (1993) rejects this position (held by Krämer, 1967) on the basis that Plato did not actually think that the Unwritten Doctrines answered any questions more fully than his written work and that, in essence, their publication was unnecessary. Whatever the truth of this it cannot be doubted that in the eyes of his successors Plato's written words held a privileged place and that is almost more important than the status Plato meant them to have.

²² It seems that Plato only really became acquainted with Pythagoreanism after his trip and so after the early dialogues had been written. Algra's and Guthrie's opinion thus stands up, in my opinion, with regard to those dialogues written before Plato's trip – the early dialogues. But I am primarily concerned with the dialogues which are generally thought to post-date his visit and which indeed show a marked change from the early dialogues. Cf. the seventh letter, 338c, for his friendly relations with the prominent Pythagorean Archytas of Tarentum, and 339a for his friendship with Archedemus. He also refers to the Tarentines as his "comrades" at 339e, is he here aligning himself with the Pythagoreans who were dominant in this city? Sayre (2005), Allen (1977), Ryle (1966), Ferber (1992) and Gill (1993) all accept to some extent the notion that the written works of Plato are not exhaustive of Plato's thought and that the Unwritten Doctrines have an independent status worthy of attention for informing our understanding of Plato. In Findlay's (1974, pg. x) opinion: "A study of Plato which confines itself to the letter of the Dialogues, such as has been attempted by most scholarly interpreters in the past two centuries, has ended up by stripping Plato of his philosophical dignity and interests, has set him before us as a brilliant, but basically frivolous player-about with half-formed inconsistent notions and methods." He builds on the work of Robin (1908) and suggests that the Unwritten Doctrines provide us with "what Plato really thought."

²³ Allen (1977) argues strongly for the relationship of the 15th century Platonist revival of Ficino with the reports of the Unwritten Doctrines *vis-à-vis* the Lecture on the Good.

Plato's direct, oral, teaching²⁴, which is why they appear to be teaching things quite different from what we find in the Platonic corpus. I will be looking at the role that the Indefinite Dyad plays in the systems of Speusippus and Xenocrates since it is from their innovations and interpretations of this that the Stoic material principle has its origins. Speusippus and Xenocrates are no more materialistic than their teacher; however the role of the Indefinite Dyad in their systems is much more clearly that of an *ekmageion* and akin to "matter" and so to the Stoic position than anything found explicitly in Plato. Xenocrates in particular will be shown to have discussed things in a manner very sympathetic to Stoic tastes, adapting Plato's bottom up – top down approach to reality²⁵. Taking the Unwritten Doctrines from Aristotle and comparing them to the known teachings of Speusippus and Xenocrates and to what we find in the Platonic corpus should suffice to anchor Aristotle's reports accurately. As for the teachings of Speusippus and Xenocrates we are fortunately not relying solely on Aristotle, but also have the reports of the Platonist Plutarch and Academic Sceptic Cicero, whom, we may assume had access to other material for sources than Aristotle's reports of these two philosophers.

It is in light of the teachings of Speusippus and Xenocrates, along with the information garnered from the Unwritten Doctrines, that I propose the true driving force behind the origins of the Stoic principles is to be found. From the biographical tradition we have reports that Zeno studied in the Old Academy under both Xenocrates and Polemo. However Hahn pours doubt on the veracity of Diogenes' report:

Diogenes' source for this information is unfortunately not specified. Since much of his material on Zeno comes from Apollonius, one would like to believe that this information comes from him too. But it is also known that a contemporary of

²⁴ Cf. Simplicius' comment that Xenocrates was the "most faithful of all Plato's pupils": *Aristotle On the Heavens*, 12.22-3.

²⁵ The idea that Plato approached reality from two directions, bottom up and top down, will be explored in chapter three. There can be no doubt that Plato thought there was a limit to the explanations that an examination of the sensible world could offer, however I will argue that there is a parallelism in his philosophy. This means that the formal world, as explained in the second half of the *Parmenides* and the Unwritten Doctrines, is constructed from an ordering principle and a principle that has order imposed on it and that this is paralleled in the sensible world using the "results" of the merging from a level above. Viewed as a single enormous system the formal is thus understood as the ordering principle and the sensible world is that requiring ordering, even though internally both the formal and sensible are in fact compounds of those principles whose roles they play. These ideas, of an ordering principle and a principle to be ordered and that of the relationship between the formal and sensible will be seen to have a significant place in the tradition of the Stoic principles.

Apollonius in the first century B.C., namely, the head of the Academy, Antiochus of Ascalon, was vitally interested in maintaining a close connection between Zeno and Polemon. Antiochus, in reaction to the previous skepticism of the Academy, had initiated an eclectic dogmatism consisting of Platonic, Peripatetic, and Stoic elements. He asserted that true Platonism was handed down from Polemon to Zeno and thereafter through a succession of Stoic philosophers to himself. To Antiochus, the nominal Academic Arcesilaus was a heretical student of Polemon and had led the Academy astray into skepticism. In the view of Antiochus, then, Zeno was actually teaching Platonic doctrine under a slightly different guise²⁶.

The doubt that Polemo taught Zeno should, I think, not be taken too seriously since it rests primarily on the fear that Antiochus is fictionalizing history for his own ends to demonstrate scholarly unity. Hahn himself says it is strange to think that Zeno would be ignorant of Aristotelian philosophy since Theophrastus was the most famous lecturer in Athens at the time²⁷ and Zeno was said to be voracious in his appetite for learning, so it is likely that he heard Theophrastus lecture. So too it would be strange if he did not spend time in the most famous school of the Ancient World. However Hahn quite reasonably doubts that Zeno studied with Xenocrates on chronological grounds but then also thinks that the two men would have had precious little in common to talk about²⁸. This is a particularly odd statement given his theory that the idea that Xenocrates taught Zeno is the result of a misspelling, and that it was in fact the Pythagorean Xenophilus whose lectures Zeno attended. The idea that Zeno attended Pythagorean lectures is indeed likely given the interest in Pythagoreanism in that and the preceding century and that Zeno is said to have written on the subject²⁹. Why, then, Hahn thinks Xenocrates and Zeno would not get on when both had an interest in Pythagoreanism is curious to say the least. In fact it will be shown that Pythagorean ideas stand at the root of the connection between the Platonic and the Stoic.

²⁶ Hahn 1977, p. 221.

²⁷ According to DL V.37 Theophrastus was attracting two thousand students to his lectures.

²⁸ Hahn 1977, p. 223.

²⁹ DL. VII. 4, many other Stoics are also reported to have written on Pythagoreanism.

I will be building on the work of Sayre³⁰ and the ideas of Crombie³¹ that: “The new mathematical schema of the late dialogues paves a way for understanding how artefacts are related to the formal world”. This “new” mathematics, built on a Pythagorean base, will be seen to be very influential in the philosophy of Xenocrates. His concerns will (especially the ones which led to his positing of minimal lines, and his theory of perception), in turn, be seen to have resonances with Stoicism and the mathematical interests of Chrysippus. The abstract mathematical concerns discussed will be seen to have a very real relevance to understanding the mode of existence and ability of the material substrate to perform as the *ekmageion* of the sensible world. By locating the focus here, in the Old Academy, I do not of course intend to rule out absolutely any influence from elsewhere, as will be shown shortly and in chapter four where I will discuss the intellectual climate of the time.

The fourth option is related to the one just discussed in that it concerns the Old Academy and Zeno’s relation to it. Sedley argued that the Stoic god can be found to have his origins in the teachings of Zeno’s reported teacher Polemo. There is a problem with this as Sedley is well aware. The problem being that we have no verbatim fragment of Polemo’s physics, nor even the certainty that he had any interest in physics whatsoever. In order to rescue Polemo from the charge of a lack of interest in physics Sedley claims that Cicero *Academica* I 24-29 is actually reporting Polemonian physics, not Antiochean as is often assumed. Sedley wants to claim the physics here for Polemo on the basis that the Antiochean account of ethics at *Academica* I 19-23 is strongly Polemonian. The account of physics here is often seen as the bastard son of Stoicism and Platonism, but since Antiochus saw the Stoics as deviant Platonists Sedley argues that any resemblance must be looked at with sympathy to Platonic origins. I believe that Sedley is right to claim a link from the *Timaeus* to the Stoa and that this link is to be found in the Old Academy³², but there seems to be no reason to suppose that this link is Polemo himself since there is no evidence of any interest of his whatsoever in physics or of his views within it. Besides this, Sedley is happy to admit that Antiochus in his effort to bring dogmatism back to the Academy was happy to adopt Zenonian arguments, showing that he was not above claiming a different school’s teaching for his own side. Indeed *Academica* II 29 states that Antiochus did not view physics as important as either epistemology

³⁰ Sayre, 2005.

³¹ Crombie 1963. pg. 157.

³² Although I do not think that the *Timaeus* is the work of the most importance in relation to Stoicism.

or ethics; Sedley takes this as implying that there is no reason why Antiochus would bother to resort to creating an historical fiction of claiming what appears to be Stoic physics for Platonism if it is not in fact Platonic. But it is equally plausible that if Antiochus was uninterested in physics that he would just plump for the physical system that is most easily defensible and does indeed relate to Platonism, though not through Polemo. The passage from *Academica* I seems to me to be fairly safely Stoic, and to have been adopted by Antiochus for the Platonist cause because it does indeed resemble Platonism; however, it does so because its origins are to be found in the pre-Polemonian Academy.

The final option for the major influence on the Stoics' physics is Aristotle. In his *The Origins of Stoic Cosmology* Hahm argues strongly for Stoicism's debt to Aristotle yet there is really nothing more than circumstantial evidence to support this claim. Sandbach's work *Aristotle and the Stoics* argues just as strongly that the circumstantial evidence is not indicative of influence or even awareness of Aristotle's ideas among the Stoics. His point that Aristotle was probably not as important in the Ancient world as he is for us is well made and is supported by the free divergence from his teachings of his students Theophrastus and Strato³³. Sandbach uses an argument from silence *par excellence* to support his position: there is no mention of any interaction, interest or reading of Aristotle in relation to the Stoics - therefore there was no relationship whatsoever between the two schools³⁴. Brehier³⁵ and Gould³⁶ both argue for Stoic awareness of Aristotle, though stopping short of the extreme debt that Hahm ascribes. The more moderate views of Brehier and Gould seem inherently more plausible since as Hahm pointed out it seems likely that Zeno attended at least some of Theophrastus' lectures. In terms of actual philosophy the Stoics do have superficial resemblances to Aristotle, but Sandbach³⁷ is right to say that the same conclusions can be reached by different people at different times quite independently of one another. However some Stoic concerns and approaches to physics do resemble Aristotle more strongly than Plato, and it is tempting to see an influence even if it was never explicit or acknowledged. Indeed superficially the Stoic distinction between active and passive principles, as well as the nature of the

³³ Sandbach 1985, p. 2.

³⁴ Sandbach 1985, p. 12, 13 where he notes the striking absence of any Peripatetic from Diogenes' list of Zeno's teachers.

³⁵ Brehier 1951, p. 149-50, where he also accepts Academic influence.

³⁶ Gould 1970, p. 119-123.

³⁷ Sandbach 1985, p. 17.

passive, appears to resemble the teachings of Aristotle more closely than it does the *Timaeus*. The *Timaeus* does not address the issue of matter while Aristotle does, hence a stronger connection is visible. Despite this superficial resemblance a deeper relationship will be seen to exist between the *Parmenides* and *Philebus* of Plato than between Aristotle and the Stoics: any supposition that Aristotle's influence on the Stoics is greater than Plato's will be seen to be based on the erroneous assumption that the *Timaeus* is the place to look for Plato's account of matter. Aristotle talks of matter as we expect it, unlike Plato in the *Timaeus*, and so do the Stoics, but any resemblance is largely owing to the fact that they are discussing the same thing rather than due to any direct influence. Similarity in doctrine is better explained by appealing to the common origin of both Aristotle's thought and Stoicism in the Academy. The distinction of active and passive or form and matter that is responsible for the superficial resemblance will be found to exist in Plato's thought. The resemblance, then, between Stoicism and Aristotle is better understood as being a result of this Platonic influence on two disparate schools of thought. The relation of Aristotelian ideas to Stoic ones will be discussed in the second part of chapter two.

In regard to Plato we have his dialogues and Aristotle's testimony, for the Old Academy we have nothing but fragments preserved in a variety of, often late, sources. For Aristotle we have his works and that of the commentators and his brilliant, though not uncritical, pupil Theophrastus. However when it comes to the Stoics we are not in such a fortunate position. The extant works of the Stoics consist of the ethical works of Epictetus, Marcus Aurelius, the collections of Seneca's writings, and the cosmological handbook of Cleomedes which is late and differs quite substantially in some areas from what can be understood to be the position of the early Stoa. There are fortunately several collections of Stoic fragments from the virtually comprehensive *Stoicorum Veterum Fragmenta* of Von Arnim to more selective collections like Long and Sedley's *The Hellenistic Philosophers* vols. 1 and 2. In assessing which fragments to take as authentic accounts of Stoic theory I have followed, as much as is possible, the methodology of Gould in his *The Philosophy of Chrysippus*; taking only those fragments which actually state that they are taken verbatim from a work of Zeno, Cleanthes or Chrysippus. Second to these, of which there are sadly not many, will be those reports which ascribe doctrines to the Stoics but which differ from doctrines which are taught by Posidonius. By comparing the fragments on physics which report "the Stoics" to those which report on Posidonius I

hope to eliminate, as much as is possible, doctrines which came in after Posidonius and which may deviate too much from the original position of the early Stoa. This is to ensure, as much as possible, that post-Posidonian ideas do not contaminate my interpretation. Posidonius seems to have followed the early Stoic line in regard to physics, and so he will be referred to in support of my interpretation but will not be the main focus owing to his relative lateness and the fact that Chrysippus is supposed to have already compiled the orthodox standpoint.

Posidonius himself does not seem to have moved too much from the orthodox position of Stoicism in regard to physics, though, as Kidd points out³⁸, he probably revolutionised the expression of the theories: and it is this revolution of expression that most likely accounts for any differences in physics between Chrysippus and Posidonius and perhaps accounts for later misinterpretations. Galen makes use of Posidonius in his works, contrasting his more Platonic account of the soul with that of Chrysippus³⁹. This tells us two interesting things: Firstly that Posidonius was probably not quite as orthodox a Stoic as his physics alone would have us believe, and secondly that Chrysippus, despite being long dead, was still viewed as the main Stoic to refute. Posidonius was a unique Stoic not only for his apparent acceptance of a tripartite soul but also for his interest in aetiology – not a primary interest to Stoics in general⁴⁰. It is not because the Stoics are not interested in causes, indeed it is integral to their position that everything has a cause⁴¹, but, according to Strabo⁴² it is because Posidonius was seen to be Aristotelianizing. Posidonius, if no earlier Stoic, was clearly familiar with and happy to employ the techniques and conclusions of both the Platonic and Aristotelian school. The fragments referring to him will thus function as a safeguard from too much later interpretation impacting on the account of early Stoicism offered in chapter one. The question about the authenticity of doctrines ascribed to Zeno in the fragments is also a difficult one to answer as the Stoics were not immune, as indeed was no ancient school, from ascribing much later innovations back onto their founder. It is thus helpful to look at Cleanthes and Chrysippus, for if something that occurs in Chrysippus is that much more developed than what we find in Cleanthes then we know that whatever is ascribed to Zeno must be closer to

³⁸ E&K. Vol. II.1, p. 409.

³⁹ Especially in his *On the Doctrines of Hippocrates and Plato*.

⁴⁰ E&K. Vol. II.1, p. 73; Strabo II 3, 8: "In Posidonius, there is much enquiry into causes ... precisely what our school sheers off from..."

⁴¹ Although non-Posidonian Stoics did admit that we would not be able to know every cause because they were "obscure to the human mind". Cf. *SVF* II.973, 351

⁴² *Ibid*.

Cleanthes than the innovations found in Chrysippus. That said there is reason to see Chrysippus as the real codifier of Stoic thought and last exponent of orthodox Stoicism.

The fragments themselves pose a problem. Most are from polemical sources, either explicitly such as Plutarch's *On Stoic Self-Contradictions* and *Against the Stoics on Common Conceptions* or else more subtly such as Alexander of Aphrodisias' *De Mixtione*. This last work will be discussed in detail in chapter 1.2.3 where I look at the interaction of the two Stoic *archai* and will demonstrate how Alexander, while seemingly setting up the Stoic position quite innocuously for discussion, actually does so in a way which makes the doctrine of *krasis di'holou* (total blending) appear completely absurd to a general audience.

Cicero provides us with an in depth and well presented summary of the salient positions of the major schools of the Hellenistic period and is invaluable as a source. His own position as an Academic (sceptic) philosopher and lawyer presumably gave him the insight to understand his opponents' (the dogmatists') positions before laying judgement upon them. As Powell⁴³ points out the balanced presentation of views should not be mistaken for vacillation or inconsistency but rather indicative of his method, and familiarity. Cicero's reports are to be taken even more seriously in regard to Stoicism when we recall that he was a pupil of Posidonius⁴⁴ and how at the end of *On the Nature of the Gods* he concludes that the Stoic position appears to be the correct one, a disingenuous, not to say meaningless, statement if he has misrepresented the Stoic position to a significant degree. Long⁴⁵ notes that for Cicero Plato and Aristotle constitute all that is best in philosophy, not in themselves but rather in their bequests to their followers indicating an interest in the post-Aristotelian philosophical schools. As well as being a student of Posidonius' he was also a follower of Antiochus of Ascalon, whose aim appears to have been the reconciliation of Platonism with Aristotelianism and Stoicism, so if Plato's main claim to greatness is what his followers did with his philosophy then we should expect Cicero to have sympathy for Stoicism and thus expect reliability in his reports.

⁴³ Powell 1995, p. 2.

⁴⁴ Cicero himself states that he attended Posidonius at Rhodes: *Hort.* Fr. 44; *Fin.* I.6; *Tusc.* 2.61; *Div.* I. 150; *Plut. Cic.* 4.

⁴⁵ Long 1995, p. 37.

Galen too offers us verbatim quotes from Chrysippus but is openly hostile to the Stoic position. His hostility to Stoicism in general and Chrysippus in particular perhaps derives from his opinion of himself as a Platonist and the Stoics as deviant Platonists, this would also explain his sympathy for the Platonic psychology of Posidonius and his use of him in attacking what would then be his wayward predecessor. A specific criticism of Galen which Gill raises and which I think is absolutely correct in a broader respect is that he simply fails to “register the wide-ranging, indeed universal, scope of the Stoic theory of active and passive causal principles and of the associated idea of pneumatic tension⁴⁶”, it seems likely to suppose that Galen lets his antipathy to Chrysippus inform his work to a great extent with the result that he often misrepresents the Stoic position. The same holds, in my opinion, for Alexander of Aphrodisias whose criticisms all too often rest on the fact that the Stoics are just not Aristotelians and so must be wrong. Take the interesting example of the Stoic theory of total blending which allows two bodies to be in the same place at the same time; if such a theory were really as absurd as Alexander and Plutarch would have us believe then why does not Cicero, who is as vicious as anyone in his characterisations, make any use of it?

Having discussed the dangers of the evidence and appropriate methods for avoiding too many misinterpretations, and put them behind us, we are now in a position to look at the actual subject of the thesis: the material principle. The idea of matter is not quite so simple as it may at first appear to our modern minds. First of all we can split matter as it relates to the sensible world⁴⁷ up into two types: prime and proximate. Proximate matter is the matter of everyday experience: wood, clay, bronze, even air and fire. It is qualified in a particular way, has exact dimensions and qualities. This type of matter is often discussed by Aristotle and plays an important role in his Form/matter distinctions. It is also the type of matter that I believe appears in the *Timaeus* to the exclusion of the prime matter that many think appears in the guise of the receptacle. Although I reject the account of the Receptacle in the *Timaeus* as being an account of matter I will not spend too much time arguing for it as space instead. It will be enough to show simply what it is not without digressing too far into what it is. The question of what underlies the elements is, in my opinion, a completely meaningless one for Plato in the *Timaeus*. Plato discusses the elements in the *Timaeus* and builds the sensible world from their interaction and order, their

⁴⁶ Gill 2007, p. 97.

⁴⁷ The only type according to the Stoics as everything that is properly said to exist is corporeal.

transmutation means that at this stage of the discussion there is no need to appeal to something “behind” them. It will be left up to us to infer what underlies the elements on the basis of Plato’s metaphysics. This is similar to the defence taken by those who deny prime matter of Aristotle: that the elements can change into each other by virtue of exchanging one of their two properties for another thus denying the need for an underlying substrate⁴⁸.

While proximate matter is in itself an interesting topic it is not the focus of this thesis, rather I am looking at the first type: prime matter, or as the Stoics term it *apoiios ousia* – unformed substance. Prime matter is, broadly speaking, that which remains when everything that makes a particular body that particular body is stripped away. In and of itself it is completely lacking in particularity. It is this fact that convinces many that the Receptacle of the *Timaeus* is in fact prime matter for Plato does indeed state that it lacks any qualities. Of course if we strip everything particular away from an individual we may not be left with anything at all, this is the position of the nominalist who rejects the notion of prime matter completely. The main reasons for rejecting prime matter are 1) that it serves no purpose and 2) that it is completely theoretical since nothing can exist unqualified and any appeal to it is like arguing that a clothed man is naked because under his clothes he is naked⁴⁹. Three things need to be said in response to these accusations: firstly *apoiios ousia* performs a very important function in the Stoic metaphysical system since “only body can act or be acted upon”. Secondly it does not actually exist unqualified at any time since it is inextricably linked to the active principle which necessarily informs the *apoiios ousia* in some particular way; and thirdly the *apoiios ousia* of the Stoics is not actually completely devoid of all properties because it is said to be three-dimensional with resistance⁵⁰. The second point seems to have brought confusion to some commentators, not least Richard Sorabji⁵¹, who have interpreted the constant connection between the active and passive principles as indicative of their natures as being aspects of a single body underlying both. This however is clearly false since not only are the active and passive almost universally referred to as bodies, each in their own right, but Cicero’s comment above that “only body can act or be acted upon,” clearly demonstrates that the active could not act on the passive if they were merely

⁴⁸ E.g. King 1956.

⁴⁹ Cf. Cohen 1984, p. 176.

⁵⁰ [Galen] *On Incorporal Qualities* 19.483, 13-16 = (L&S 45F = SVF 2.381 part.)

⁵¹ Sorabji 1998.

aspects of a yet more simple, single, body underlying them both. The Stoic belief that only body can act or be acted upon forces them to have two opposing *archai* yet they also claim to be monists. These are two seemingly incompatible positions and Sorabji uses this as evidence for his position; however the constant conjoining of the two *archai* is, in my opinion, meant to be understood in terms of their theory of *krasis di'holou* which, as we noted above, allows two bodies to be in the same place at the same time. If this is the case then the fact that they have two *archai* ceases to meaningfully contradict their claim to monism. The question of Stoic matter becomes more complicated because we have now to answer the question of what is the difference between matter and body? After all both the active and passive principles are referred to as bodies⁵². The passive principle is a body that is inert and *qua* itself unqualified, the active is a rational body. The answer would seem to be something like: matter is how the passive principle is characterized when we discuss it *qua* itself – body is how it is understood as the partner of the active principle. After all saying “*matter* can act or be acted upon,” would seem strange since matter is commonly conceived of as inert, the acting requiring intentionality that only soul can possess.

The Stoics call their prime matter *apoiios ousia* which, if Hahn is right and the Stoics were heavily influenced by Aristotle, is strange since for Aristotle prime matter is not a proper substance. In the *Categories* the controlling definition of a substance is to be a subject, the more of a subject something is the more of a substance it is; since Socrates is a proper subject: he is a substance. In the *Metaphysics* though the emphasis has changed somewhat, substance is now a cause, it is that which makes a man a man or a horse a horse. Substance can cease to exist; when a bronze statue is melted down the substance has been destroyed and a new substance with the same proximate matter (the bronze) stands in its place. In Platonism substance was regarded as form alone since the forms are the true subject of discourse. Matter is an unstable and deceptive aspect of the world. So why then do the Stoics call prime matter a substance? This question will be looked at in greater detail in the second part of chapter two where I will show that the Stoics were involved in a great innovation which can be seen as, but is not necessarily, a manipulation of Aristotelianism. It will be seen that the Stoics accepted the conclusions of Aristotle's discussions when he rejected them⁵³. Aristotle does consider matter (both prime and

⁵² DL VII.134 = (L&S 44B = SVF 2.300, part, 2.299.)

⁵³ As Robinson (1974, p. 184) points out. He goes on to add that it is probably as a way out of accepting prime matter as substance that Aristotle added separability and thisness.

proximate) as substance in *Metaphysics* H1 1042a26⁵⁴ and Λ3, 1070a9⁵⁵ and his reasons for doing so appear to be the ones which the Stoics favour: that prime matter underlies all change and there is nothing else which underlies it. The Stoics can thus be seen to accept Aristotelian reasons for claiming *apoiōs ousia* as substance, though this of course does not mean that they could only have reached these conclusions after consulting the relevant texts.

Things take an even more interesting twist when we consider further the doctrines of the Old Academy and the Platonic teachings not found in the traditional *corpus*. While the forms may act as substance in Platonic metaphysics, it is less than clear whether or not there is such a thing as the equivalent of prime matter in any guise in the system. It is the contention of this thesis that it is fact in reaction to the doctrines of the Old Academy in regard to the Indefinite Dyad that the Stoics developed their concept of *apoiōs ousia* and its function in physics. In the metaphysics of Speusippus, Xenocrates and, I believe, in Plato, the Indefinite Dyad performs the function of material principle to the formal principle of the One: it is in essence an incorporeal matter. The reason there is so much disagreement in interpreting the physical dialogue of Plato, the *Timaeus*, in respect of its teachings about some underlying, permanent, possibly material, substrate is that there is simply nothing in that dialogue which can answer to the role. Plato has a singular lack of concern with the “material” world and so stops at the elemental level because there is nothing to be gained by delving any further, in fact he probably only goes that far because of the precedent set by the pre-Socratics in their physical discussions. There is no explanatory purpose to be gained, in Plato’s mind, by discussing the very basis of the sensible realm since prolonged focus on it as a whole is misguided. However the idea of a material substrate is present in some of the written works of Plato and is even stronger in the Unwritten Doctrines. This material substrate differs from the Stoic in that it is non-corporeal while the Stoic matter is virtually a synonym for corporeality. Plato’s successors built on his teaching of non-corporeal matter but variously attempted to apply it to the sensible realm, more for the sake of completeness than any other reason as far as I can see. The matter of the sensible realm in fact turns on Pythagorean ideas and the relationship of number to the world. To support this I

⁵⁴ “The substratum is substance, and this is one sense the matter (and by matter I mean that which, not being a ‘this’ actually, is potentially a ‘this’)”.

⁵⁵ “There are three kinds of substance – the matter, which is a ‘this’ by being perceived (for all things that are characterised by contact and not by organic unity are matter and substratum)”.

will build on the work of Long's paper "The Harmonics of Stoic Virtue" to show the Stoics' interest in number as capable of offering explanations of the order and nature of the world. The doctrines of Plato's successors will, then, be shown to be far closer to the "real" teaching of Plato than was imagined, simply because we have been erroneously using the dialogues as an exhaustive canon. While the Stoic material principle may on the face of it resemble Aristotle's conclusions about such a principle it will be seen to have been the case that the Stoics reached or supported their conclusions through Platonic considerations and not Aristotelian.

The discussion in the thesis will run as follows:

Chapter one will begin with a short discussion of matter and its role in physical systems. The main part of the chapter (1.2.1 and 1.2.2) will be a discussion of the early Stoics and their physical system involving an in depth look at the nature and role of *apoiós ousia* and its relation to the active principle. The second half of this section (1.2.3) will involve a discussion of the Stoic theory of *krasis di'holou* and demonstrate its application to the *archai* alone.

Having explained the nature of the object of our search chapter two will begin with an interpretation of the *Timaeus* along traditional lines. The search through this physical dialogue for a precursor to the Stoics' *apoiós ousia* will demonstrate the fallacy of seeking for a single influence and taking the *Timaeus* as the sole explicator of Plato's physics. The second part will involve a discussion of Aristotle and his approach, arguments and conclusion about prime matter and how it relates *prima facie* more fully to the Stoic account than the account offered in the *Timaeus* does.

Chapter three will bring in other Platonic dialogues and the Unwritten Doctrines. These will help furnish an understanding of Plato's late ontology which will be seen to answer to the role of main influence on the development of *apoiós ousia* more fully than either the *Timaeus* alone or Aristotle. The third part of this chapter will examine the theories of Speusippus and Xenocrates in light of the revised Platonic metaphysics. It is after this that a defence of the Stoics interest in mathematics will take place to tie them in more strongly to the Old Academic tradition of Speusippus and Xenocrates. It is in the final part of this chapter that I will assess the argument of Sedley's "The Origins of Stoic God", rejecting Polemo as a significant influence on Stoic physics. The *Parmenides* will be seen, along with the *Philebus*, to furnish the

main influence and method of understanding the physics of Plato and the Old Academy.

Finally, chapter four will discuss the Stoics' pre-Socratic heritage with a discussion of the material theories of some Ionians and the titular precursor of Stoicism: Heraclitus. Since the preceding chapter will have shown the main influence on the Stoics to have been Plato's esoteric teachings as revealed by the Unwritten Doctrines and his students this chapter will serve more as a formality and a way of closing the discussion of matter in the Ancient world by going back to its origins and first exponents. The second half of this chapter will, as well as looking at general pre-Socratic ideas, look at mythological and medical imagery. The Derveni papyrus will serve as an example of the interpretation of naïve myth in a pseudo-scientific way. This will be compared with the Stoics' use of the female and wet as analogous to the material principle. This idea will be built on by a brief exegesis of medical and Aristotelian biological imagery of the woman as receptacle. This discussion will show the way in which matter was understood to work in the physical system for the Stoics rather than develop an understanding of pure *apoiós ousía*. It will also be seen that it is likely that, as with their discussion of *krasis*, their use of everyday language to describe the workings of matter is a probable cause of the long running misunderstanding of the Stoic concept of the material principle.

It will only remain for the thesis to conclude that the nature of *apoiós ousía*, its role and relation to the active principle owes more to Plato, though not as traditionally understood, and the Old Academy, though not to Polemo, than was previously accepted or supposed.

Chapter 1

1.1 Matter:

The subject of this thesis is matter or, more precisely, the material principle of the sensible world. In order to understand the Stoics' account of their material principle, which they term *apoiós ousia*, it will be helpful to first discuss the general nature of matter. The philosophical tradition of the West has grown up with the Aristotelian distinction between form and matter and so this is a good place to start with the general understanding of matter. Matter is the passive receiver or bearer of properties or form. This simple explanation will be seen to capture the various uses that Plato, Speusippus, Xenocrates, Aristotle, the Stoics, and indeed all of us who think about it, make of matter.

Matter is the bearer of properties. But it can do much more than just fulfil this simple role. It can be a persistent substrate: that which is responsible for an object's remaining the object it is despite the alteration of its properties. Matter can account for persistence over time and through change. I say "can" because there are several types of things that we may call matter, each of which can perform slightly different activities:

1. Proximate matter⁵⁶;
2. Incorporeal matter⁵⁷;
3. Primary matter.

Proximate matter comes in a variety of guises and is the sort of matter which we encounter in our everyday experience. Proximate matter is a matter which is of a particular type: stone, bronze, ice, etc. It is the sort of thing that we manipulate to create everyday objects. Proximate matter is, like the objects that are made from it, a particular. A statue made of a lump of bronze is made from a matter that is already a particular lump of bronze. It has definite properties such as the generic properties

⁵⁶ Proximate matter can be understood simply as the matter underlying anything. In this respect the four elements, for ancient philosophers, will be the proximate matter of the things we use in the world – stone, metal, etc. However, for the purpose of this thesis I will be using the term "proximate matter" to refer only to the everyday matter that we encounter. The four elements will be referred to as the "Four elements".

⁵⁷ Alexander of Aphrodisias (*De Anima* 3, 21-4,4 = 17b1 Sorabji vol.2) makes use of incorporeal matter as underlying all sensible body, a use that is not explicitly considered by Plato or Aristotle.

of bronze (e.g. the fact that it is bronze) but it also has its particular properties which belong to that individual piece of bronze – *its weight, its size, its shape and its particular colouring*. In short, proximate matter is not the material principle *par excellence* because it already has some properties necessarily, without which it would not be what it was. Perhaps more importantly this possession of properties limits what each type of proximate matter can be made into: for instance a ship made of stone would fail to fulfil the role of a ship, whereas wood or steel are suitable for such a purpose. Each proximate matter has some impact on what it can be made into and so for each type it is true that it cannot be the proximate matter of any object.

Incorporeal and primary matter are of an ilk. By this I mean that they perform the same function but in what may be understood as different spheres or realms of reality. The Stoics have only one sort of reality: that which is sensible. Only sensible things are said to properly exist⁵⁸. Accordingly they have no need, or use, for incorporeal matter⁵⁹; however incorporeal matter's relationship to primary matter will be shown throughout this thesis to be of the utmost importance in the development of the Stoics' own particular conception of their *apoiou ousia*. Incorporeal matter has different roles in different philosophical accounts. In Plato's, which will be discussed in chapter three⁶⁰, incorporeal matter can be identified with the Indefinite Dyad, the others and multiplicity. This Indefinite Dyad, which exists at all levels of the complicated and hierarchical Platonic metaphysics, variously appears as a sort of proximate matter rather than a primary matter. However at the highest level of reality this Indefinite Dyad is characterless, featureless, devoid of spatial extension: it is to all intents and purposes the ultimate nothing. However it is then acted on by its corresponding principle, the One. This manipulation produces a minimally qualified matter (called again the Indefinite Dyad), which in turn is manipulated by its correlate (again a One). But at these levels, and for some time later, there is still an absence of something that is intuitively connected to any concept of matter – three-dimensional or sensible reality. This Indefinite Dyad is incorporeal matter completely. It acts as the possessor of form at the formal level

⁵⁸ They do admit of a subset of things such as limits and time which are incorporeal but which are also said to only subsist rather than to exist properly, cf. e.g. *SE Against the Professors* 10.218 (=L&S 27D = *SVF* 2.331, part). This idea will be explained more fully in part 1.2.2.

⁵⁹ Indeed for the Stoics the notion of an incorporeal matter is almost contradictory. It will be seen in the next part of this chapter that matter and corporeality are essentially synonymous for the Stoics.

⁶⁰ The *Timaeus* will be discussed in chapter two but it is only in chapter three that Plato's more developed philosophical account involving matter will be found.

and so in this sense is matter. Aristotle, however, makes use of incorporeal⁶¹ matter in a less elaborate way as will be discussed in the second half of chapter two. But briefly: he asks what, when we think of a number, is that number is said of⁶²? If we discuss abstract number then it is clearly not said of anything. But it cannot exist as pure form, and so there must be an incorporeal matter of the abstracted number which the number is in fact said of. As well as in relation to abstracted number Aristotle also makes use of intelligible matter for geometrical shapes. In this case plane geometry will be conceived of in two-dimensional Euclidean space.

As mentioned earlier, the Stoics have no time for such a thing as incorporeal matter. They could make no use of it as there are no proper noetic or formal objects as we find in classical Platonism of significance in the Stoics' metaphysics⁶³. The thoughts of god, the most likely candidate for archetypal noetic or formal objects, are in fact corporeal dispositions as are any affections of the soul for the Stoics. In fact they go further implying that the thoughts of god are not just corporeal but are the very objects in the world – which includes the world itself. God's thought, in its guise of the cosmic *pneuma pervades apoios ousia* and imbues it with particular properties. God's corporeal thought is the formal element of the world: it is corporeal formal disposition disposing the passive material principle directly. This brief description of Stoic physics will be much more fully discussed in the remaining parts of this chapter.

Primary matter differs from intelligible matter in that it is a principle of the corporeal world. It differs from proximate matter in that we do not encounter it or manipulate it. In fact it ultimately underlies all proximate matters: so that while, say, iron relies on the Four elements for its existence and the Four elements rely on primary matter, it in turn relies on nothing. Primary matter is the bottom level and there can be no appeal to anything below it, else that thing would be primary matter instead. The Stoics take this a step further, and can do so because for them matter is a body. For the Stoics, as a result of its underlying all corporeal proximate matters, primary matter is itself the principle of corporeality. Just what this means and how it affects its use in various system of philosophy will be discussed throughout the thesis.

⁶¹ Normally understood as "intelligible matter" in Aristotle.

⁶² *Metaphysics* 1059b14-16, cf. 10361-12, cf. Gaukroger 1980.

⁶³ Or more strictly just their physics since they did not believe that there was anything beyond physics. However the topics that matter relates to are more commonly subsumed under the term metaphysics and so I will adopt this un-Stoic terminology.

The Four elements that proximate matter relies on are the traditional level at which the majority of pre-Socratic philosophers seem to have stopped their enquiries. For instance Thales (as interpreted by Aristotle and his followers), traditionally the first philosopher, appears to have reached the conclusion that the primary matter was not primary matter in the sense I will discuss; but rather was the element water⁶⁴. This idea and its relationship to the understanding that this earliest philosopher has of our topic will be discussed in chapter four. If we follow Aristotle then Thales would seem to understand the notion of “primary matter” as being the first sort of disposed matter; not that which all things that are material rely on. He was not alone in his cessation of inquiry at the elemental level, we have already noted⁶⁵ that Plato (in the *Timaeus* at least) does not go below this level either. Thales’s and Plato’s near contemporaries did the same. Heraclitus, who in the introduction was noted as the person to whom the Stoics claimed their greatest debt, seems to have ended his enquiry with fire being primary matter⁶⁶. Empedocles went a different way and claimed each of the elements in equal measure: there is no primary matter but four primary matters⁶⁷ each coming together in different proportions and arrangements to make the world, but never being created nor destroyed.

The notion of primary matter in the sense that is the topic of this thesis thus really only comes about after the pre-Socratic period but their enquiries into nature undoubtedly fed the imagination of their successors and some their most pertinent ideas will be discussed in chapter four to give a flavour of the intellectual climate that material theories were developing in.

The *apoiou ousia* that god permeates is the main subject of this thesis. I will argue throughout this thesis that Plato’s main concern about a substance like prime matter is with regard to the incorporeal world. However the sensible world is an image of the formal and as such it has its own matter as an image of the “higher” formal matter. Just as we look to the formal world for reality in forms so too to understand matter properly we must look not at the sensible matter but rather at the incorporeal matter. It is the relationship between his conception of incorporeal matter and the

⁶⁴ *Metaphysics* 983b20-2.

⁶⁵ See page 16 above.

⁶⁶ A more detailed discussion will take place in chapter four.

⁶⁷ Fr. 31B17.1-13 DK = 194 Barnes.

Stoic *apoiou ousia* that will form the main discussion via incorporeal matter's interpretation in the Old Academy. In the second half of chapter two I will argue that Aristotle has an understanding of primary matter which is similar to the Stoics', this will be contrary to King⁶⁸ and build on the discussion between King and Solmsen⁶⁹.

In order to better understand the notion of an underlying material which is the ultimate bearer of properties in the sensible world it will be helpful to look at an alternative theory. It was noted above that quite clearly the Stoics believed this sort of entity to exist and I will argue that the same is true of Aristotle⁷⁰, but we also saw Plato's metaphysics takes precedence over his physics and that his conception of matter in the sensible world will be a pale reflection of incorporeal matter. Primary matter serves a fundamental purpose in those theories which accept it, how could Plato even begin to explore the nature of the sensible world without primary matter?

Cornford⁷¹ argues that Plato does not need primary matter because he is a bundle theorist. Each object is not reducible beyond the bundle of properties that it has⁷². These properties do not inhere in anything so there is nothing beyond the substance which is made of those properties that bears those properties: Socrates has the properties that Socrates has because he is Socrates – there is no matter that is not Socrates under him which Socrates is said of⁷³. This position does not need an underlying substrate of which things are said. A popular reason for adopting this position is that it is argued that the very notion of a bare substrate – primary matter – is simply incoherent. As noted in the introduction Cohen argues that a belief in primary matter is akin to a belief that every man is naked because he is not wearing anything under his clothes. In the words of Loux⁷⁴ what the substratum theorist, that is a believer in primary matter, is committed to is the following: "In positing bare particulars as the exemplifiers of properties, substratum theorists are claiming that the literal exemplifiers of properties exemplify none of these properties essentially or necessarily." This position, he argues, is incoherent as it is not possible for

⁶⁸ King. H.R 1956.

⁶⁹ Solmsen 1958. cf. Furth 1988.

⁷⁰ No matter how uncomfortable this may have made him.

⁷¹ Cornford 1939.

⁷² There are two types of bundle theorist: 1) the properties in the bundle are universals; 2) the properties in the bundle are property-instances. On an uncontroversial understanding of Plato he would be committed to the first as a result of his theory of forms. Cf. Armstrong 1980, pg. 108ff.

⁷³ This is, in essence, the argument used by Aristotle to argue that Socrates is a substance rather than Primary matter – this will be discussed in the second part of chapter two.

⁷⁴ Loux. 1998. pg. 240.

something to exist with no essential properties. The Stoics are not immune from these criticisms but their particular conception of primary matter as a three dimensional body always qualified in some respect by the active principle insulates them somewhat. *Apoios ousia* has properties. This claim can be understood in two ways:

- 1) It is defined as extended in three dimensions.
- 2) It always has some more properties than this since it is never found independently of the active principle. The active principle has to act and so it always informs the passive principle, even at the state of *ekpyrosis* when it does so as simply as it can by making everything fire.

The first point, that prime matter simply is extended in three dimensions, is really the notion that ties the origins of *apoiios ousia* back to the Platonists. This is the standard definition of mathematical body, and as we will see below and throughout this chapter, this vague definition raises several issues. We will see pseudo-Galen add resistance to the definition of body in order to make it more understandably sensible. However the Stoics use the mathematical definition of body to define the material principle (and to some extent the active principle too) since they are coming from the Old Academy. The relationship of the material principles of Plato, the Old Academy and the early Stoics will be seen to most likely rely on the connection offered by mathematics. Evidence of the early Stoics' interest in mathematics will be given in chapter three and will show them to have been very much in the Old Academic model when it came to this subject.

We have seen that matter in its various guises acts as something that is manipulated to bear properties. In the case of proximate matter this manipulation is primarily applied by human artisans and it comes to bear only properties which are not inconsistent with the basic properties that make the particular type of proximate matter that sort rather than another. Briefly we saw Plato's use of intelligible matter as the instantiating principle for his forms, the Dyad is needed for the form Two to be Two rather than something else. Intelligible matter for Plato acts in the same way as proximate matter, i.e. as also the bearer of the forms. *Apoios ousia* acts as the underlying "out of which" that god makes the world from. It is responsible for

objects' three-dimensionality and passive nature. It is the aspect of an object that helps make it true that everything can be manipulated. God alone, although he too is a body, can not be solely responsible for a sensible object's ability to be acted upon.

So matter, as the subject of this thesis and the object of our search, will come in at least two guises: incorporeal and primary. Primary matter for the Stoics has some properties but for Aristotle it has none. But there are key identifying characteristics of the object of our search: Matter must be an *ekmageion* – an “out of which”; it must be the least qualitative thing of all; it must remain unchanged in nature while facilitating change; and it is responsible for the persistence of the object through time and property alteration. The object this describes is, in Stoicism, very clear: it is *apoiós ousía*. Proximate matter, it will be shown throughout this thesis, since it relies on principles for its existence is simply the wrong sort of matter. For Plato I will argue that the closest candidate for such a thing is his incorporeal matter: the Indefinite Dyad; while for Aristotle I will argue that his *Metaphysics* demonstrates the need for a qualityless substrate. The thesis will make clear the relationship between the Indefinite Dyad of Plato and the *apoiós ousía* of the Stoics via the teachings of the Old Academy.

1.2.1 The Stoic *Apoios Ousia*:

This part of the chapter will look at the evidence of the Stoics' belief in primary matter. It will look at the role that it fulfils in the world and in their physics. In looking at the Stoics' primary matter, which we have already noted they term *apoiios ousia*, I will also discuss the active principle and the relation that exists between the two.

The Stoics are complete materialists. Everything that exists which has proper causal efficacy is bodily. It is this ambiguous term "bodily" that will occupy some of our time: asking whether or not matter is itself, and in its own right, a body. The reason why such a thought would occur comes from two texts primarily.

Firstly there are the words of Diogenes Laertius:

They [the Stoics] think that there are two principles of the universe, that which acts and that which is acted upon. That which is acted upon is unqualified substance, i.e. matter; that which acts is the reason in it, i.e. god...the principles are also bodies and without form⁷⁵. (Trans. L&S)

Secondly are the words of Cicero: "that only a body was capable of acting or being acted upon⁷⁶". It seems clear that matter is a body, but that it is not the only thing that is body in the universe. Given the assertion that "only body can act or be acted upon", and the exclusive disjunctive sense that I understand this to have, it seems that the Stoic universe is at base populated by at least two different bodies. If the only sort of thing that can act or be acted upon is a body then the principles of existence must be bodies, else it is impossible to see how the world could get started. If the material principle is a body then it follows that it can be acted upon. But if that is the case then it cannot act. However as we will see below it is reasonable to suppose that the Stoics used "body" in two ways: of the principles and of the objects in the world. The phrase of Cicero's then has two interpretations:

1) In relation to principles only one can act and the other be acted upon;

⁷⁵ Diogenes Laertius 7.134 (=L&S 44B = SVF 2.300, part, 2.299).

⁷⁶ Cicero *Academica* 1.39 (=L&S 45A = SVF 1.90.) (Trans. L&S)

2) For things in the world only bodies have any causal efficacy because they are the only things capable of acting and/or being acted upon.

The Stoics are employing the same tricks of ambiguity that Plato does in the *Parmenides* so that confusion seeps in through misunderstanding and polemic. The Stoics say one thing of body which is true but takes on different meanings of truth depending on the use of "body" – and for the Stoics there are two. If only body can act at the level of principles then it follows that there is another body - the active principle – whose role it is to act on the passive principle. It then follows that some explanation is needed as to how both a passive material principle and an active principle can be bodies.

If there is any doubt that the active principle is to be considered as bodily consider Aristocles:

He [Zeno] says that fire is the element of what exists, like Heraclitus, and that fire has as its principles god and matter, like Plato. But Zeno says that they are both bodies, both that which acts and that which is acted upon, whereas Plato says that the first active cause is incorporeal⁷⁷. (Trans. L&S)

The active principle of the Stoics is clearly contrasted to the incorporeal first cause of Plato. It follows that Aristocles certainly thinks that the Stoics conceive of god (since he is the active principle) as corporeal. The only sense that this can have, given that he must differ from the material principle, is that the active is simply active in contrast to the material principle simply being passive: These are just their natures⁷⁸.

Both Diogenes Laertius and pseudo-Galen⁷⁹ assert as a definition of body the standard mathematical definition: "body is what has threefold extension – length,

⁷⁷ Aristocles (Eusebius, *Evangelical Preparation* I 5.I4.I) (=L&S 45G = SVF 1.98, part)

⁷⁸ God would be the cause of his being active, since it is his nature and he is the principle of quality while matter would require no cause of its lack of disposition. God is active because that simply is what he is and matter is passive because that is simply what it is.

⁷⁹ *On Incorporeal Qualities* 19.483, 13-16 (=L&S 45F = SVF 2.381, part) where he adds resistance to the definition.

breadth and depth; this is also called solid body.⁸⁰ In the light of this it is easy to understand why some commentators, such as Sorabji⁸¹, have considered the active and passive principles to be aspects of something more fundamental – body. However this clearly cannot be the case for two reasons:

1. If this were the case then *apoiros ousia* could not be prime matter since it would rely on something below it for its existence, violating one of the key attributes of prime matter.
2. If “body” were a single something that existed below both god and *apoiros ousia* then it would violate the principle that Cicero gave us: that only body can act or be acted upon.

Instead it seems that the most plausible way to understand the situation is as was suggested above: that god and *apoiros ousia* are in fact both bodies, but disposed in different ways that correspond to their two very different roles in the world. The next section, which discusses the interaction of the active and passive principles, will explore Sorabji’s understanding of the two principles as incorporeal aspects of a more fundamental body by drawing in more of the Stoics physics as our understanding of the active principle increases.

Despite the strong evidence that the principles are corporeal there is the text in the Suda, parallel to Diogenes Laertius 7.134, which states the principles are in fact incorporeal. However the overwhelming evidence is that they are both corporeal, and this is reinforced by the absence of the principles from the lists of incorporeals⁸². Any interpretation that uses this text as support for the notion that the principles are incorporeal, or aspects of a more primitive substance, will be shown in the remainder of this chapter to be based on further misunderstandings: The most common being the mistaken understanding of the nature and role of *pneuma*. *Pneuma* will be shown to be simply another name for the active principle while it is performing a particular function and not a compound of fire and air as is often mistakenly thought.

⁸⁰ DL 7.135 (=L&S 45E =SVF 3 Apollodorus 6, part) (Trans. L&S) This definition is also, confusingly, shared with void and place but this will be discussed in the next section. The Stoics’ interest in mathematics will be explored in chapter three.

⁸¹ Sorabji 1998.

⁸² E.g. Sextus Empiricus *Against the Professors* 10.218, (=L&S 27D = SVF 2.331, part) “They [the Stoics] say that of somethings some are bodies, others incorporeals, and they list four species of incorporeals – sayable, void, place, and time.”

Further evidence that the Stoics thought there was a single underlying material substrate of the sensible world can be found in Calcidius. Calcidius informs us that Zeno believed in an underlying substrate and that this is to be understood as “universal body”: “Zeno says that this very substance is finite and that it is the one common substrate of everything which exists.⁸³” and:

And so the universal body, according to the Stoics, is limited and one and whole and substance. It is whole, because it does not lack any parts; it is one, because its parts are inseparable and mutually coherent with themselves; it is substance, because it is the prime matter of all bodies...But while substance changes, it does not perish either as a whole or by the destruction of its parts...for even though all bodies disintegrate by some chance, matter still exists always⁸⁴. (Trans. L&S)

Diogenes Laertius and Sextus Empiricus⁸⁵ support Calcidius’ assertions about the Stoics in general, ascribing to them the belief in an “unqualified substance (*apoiou ousia*): i.e. matter⁸⁶”. This, according to Diogenes, differs, as in Calcidius, from the elements in that it is indestructible and without form. We have, then, substantial evidence that the Stoics, from their very foundation, believed in the efficacy of the corporeal alone and, further, that they believed in an underlying substrate that fulfils the requirements we met above to be classed as Prime Matter: it is indestructible, it is devoid of inherent shape, it always exists relying on nothing else for that existence and most importantly it underlies all change in the corporeal world. Calcidius’ rather odd comment that all bodies will disintegrate while matter, or *apoiou ousia*, will remain constant can be understood as a fallacy on his part. It seems likely that he is now referring to the second use of the term “body” where it is something that comes about subsequent to the interaction of the two principles⁸⁷. It

⁸³ Calcidius 292 (=L&S 44D part, = SVF 1.88, part) (Trans. L&S)

⁸⁴ Calcidius 293 (=L&S 44E part).

⁸⁵ Sextus Empiricus *Against the Professors* 9.75-6 (=L&S 44C = SVF 2.311): “The substance of what exists, they [the Stoics] say, since it is without any motion from itself and shapeless, needs to be set in motion and shaped by some cause.”

⁸⁶ Diogenes Laertius 7.134 (=L&S 44B part = SVF 2.300, part, 2.299).

⁸⁷ A not uncommon mistake or criticism. Amongst others Plotinus (*Enneads* 6.1 [42] 26 [17-23] = 17c4 Sorabji vol. 2) in his criticism of the Stoics also makes matter a principle of body, saying that all bodies are compounds of matter and form. When he does consider the actual Stoic position, that matter is really passively disposed mathematical body, he dismisses it out of hand.

is of course true to say that the elements, which are formed by the interaction of the active on the passive, are bodies too and that they will disintegrate but it does not follow that all bodies do so since the indestructible principles are themselves bodies.

We have seen that the Stoics call body that which is extended in three-dimensions, and that this will apply to the passive principle and to the active principle. The active principle, responsible for all qualities, is, like prime matter, a body; not an aspect of an underlying body as we noted Sorabji suggest above. Pseudo-Galen⁸⁸ and Alexander of Aphrodisias attack the notion of quality as body, using largely the same arguments⁸⁹. Large amounts of Alexander's discussion, though not all⁹⁰, seem to be directed specifically against the Stoics. The disparity in the force of the arguments could be explained by Alexander's discussing the arguments for their own sake and the Stoics happen to be a convenient school on which to test them out. Alexander notes several arguments against the notion that qualities are bodies. However the force of some of his objections is mitigated by the fact that he is taking the notion in a very common sense way and not directly against the more sophisticated Stoic categorisation of "qualifieds" over "qualities". Alexander's discussion opens up an interesting discussion into the notion of *pneuma* which he does not discuss directly here but will have resonances with the discussion of total blending found in the final part of this chapter⁹¹. Although Alexander's text may not have been written for the purpose of attacking the Stoics it is interesting to note how his arguments affect them and what their potential responses to the points made could have been. By showing the Stoics as being capable of answering the criticisms of a position that they are known to have held we will see more clearly the way in which their concept of body and its relation to quality may best understood. By understanding the active principle's function and existence as a body the correlate function and existence of the passive principle as a body too will be better understood. Pseudo-Galen's understanding of body as three dimensional with resistance, which really poses the greatest problem will be seen to be based on the same *modus operandi* as

⁸⁸ Although they could both be basing their understanding on a third source.

⁸⁹ As Dillon (1993) makes clear Alcinoüs in his *Didaskalikos* uses five formal arguments in favour of the position that qualities are incorporeal. He takes the direction of the arguments to be against the Stoics as they are the target to be most likely argued against. The arguments put forward in the *Didaskalikos* differ in style and somewhat in content from pseudo-Galen, though there are in fact quite strong similarities to the text of the *Mantissa*, and this does not discount a possible single source for all three texts.

⁹⁰ Alexander *Mantissa* ss6, 123,21-24 would, as Sharples points out in his translation, have no force against the Stoics and Alexander seems too well versed in Stoicism to think it would do.

⁹¹ That discussion is focused on Alexander's *De Mixtione* but he does discuss the notion of two bodies being in the same place at *Mantissa* ss14.

Alexander's criticisms: viz. understanding "body" in a common sense way when the Stoics do not even understand mundane body in a common sense way, let alone body as principle or quality.

I will not discuss all the objections raised by Alexander but some of the more interesting ones are:

- 1) Quality is not a substance because the two are of a different nature. Every body is a substance. Therefore quality is not a body⁹².
- 2) If quality were a body it would be tangible. Whiteness is a quality but is not tangible. Whiteness is not a body. Therefore quality is not a body⁹³.
- 3) Every body possesses a quality. If quality is a body then every quality will have a quality. That quality possessed by the quality will be a body and so possess a quality. This will continue *ad infinitum*. The implication of this is that if this is not the case then the chain ends arbitrarily and there would be no reason to suppose that the first quality is a body⁹⁴.
- 4) If qualities are bodies then the bodies that they are said of should be either increased by their presence or diminished by their absence. This is not the case⁹⁵.
- 5) If qualities are "chased out" by a new quality coming in then where will the "retreating" quality go? If it is a body it must have a place⁹⁶.
- 6) Bodies do not perish into non-being but qualities do. Therefore a quality is not a body⁹⁷.

Alexander's most ingenious argument is really an embellishment of 3 above where he argues against the notion of quality as body. This elaboration is found at 123,36-124,9 where he says:

Moreover, if quality is body, and every body is either matter or composed of matter and quality, one or other of these options will apply to quality too. Well, for it to be matter is impossible; so what is left is to say that quality is composed of matter and

⁹² 122,17-25.

⁹³ 122,26-28.

⁹⁴ 123,4-7.

⁹⁵ 123,14-17.

⁹⁶ 123, 17-18.

⁹⁷ 123,34-35.

quality. But if so, then, first, quality will not be quality but matter and quality (for these are different from each other), and moreover the quality that is combined with the matter will also itself be matter and quality, if it is a body, and so on to infinity, and there will be an infinite number of matters in each quality. For if matter is quality, every body that is in actuality will not be composed of matter and quality, but of quality and quality; that is of matter and matter, if matter and quality are the same thing. And there will be no difference between matter and body which is actual. But if this is so, and matter is without quality, body which is actual, too, will be without quality, and either quality will not even exist at all, or there will be no body other than quality. (Trans. Sharples)

This has a strong resemblance to the argument that we will see him deploy against the Stoic notion of total blending *vis-à-vis pneuma* and matter. This argument has very interesting implications for the discussion of the active principle that will take place in the next part of the chapter but it will be enough for the moment to suggest that for the Stoics things are the other way round. That is: everything is bodily and quality is the result of body acting on body. *Pneuma*, which is responsible for the qualities that exist in the world, is indeed a synonym for god and as such is rationally disposed body. But that is simply what god is, there is nothing of which the rationality is "said" in the way that whiteness is said of wood. God *is* rationality and rationality *is* body rationally disposed: nothing more.

As with the issue of total blending the problem seems to arise through a lack of understanding of the terminology involved. The Stoics are using language in their own particular way. The responses that are presented below are a supposition on my part, but they are supported by way of fitting into the framework of Stoicism that I have been arguing for and will continue to do so in the rest of the chapter.

For the first objection it is true that for an Aristotelian substance is to be found in bodies that are compounded of form and matter⁹⁸ but for the Stoics the *apoiós ousia* is a substance. Granted *apoiós ousia* is different from quality too but if one principle

⁹⁸ Both Aristotle (*Metaph.* H1) and Alexander (*De Anima* 6.2ff) are to some extent happy to accept matter as a substance, though it is an inferior substance to form or the form/matter compound.

is a substance then it seems reasonable to suppose that perhaps not everyday qualities are substances but that the thing responsible for quality – god – is a substance too.

The second objection rests on a primitive understanding of what it is to be a body. However pseudo-Galen⁹⁹ does state that a body for the Stoics is three-dimensional *with resistance* which suggests that tangibility is indeed something that is intrinsic to body. However the Neo-Platonists accept immaterial bodies. The Stoics quite clearly do not but perhaps they shift their understanding of “body” depending on what body it is that they are talking about. After all the majority of texts omit resistance from their definitions. The bodies that are compounded of matter and god are indeed “with resistance”. God can remain a body – extended in three dimensions – without having resistance. While it is utterly reasonable to suppose that tangibility is something that all bodies possess it is clearly not something to be taken for granted as the Platonists’ acceptance of incorporeal bodies shows. By rejecting resistance as a necessary condition of being a body the Stoics may move into the uncomfortable territory of accepting a mathematical definition of body as that of sensible body too, but it would hardly be the strangest thing they did. Tangibility is surely itself a quality and is no more than implied by the notion of resistance but the connection is no stronger than between resistance and three-dimensionality. What we come to in response to this, which I see as the most troubling objection, is that the Stoics use the term “body” in more than one way; that is they use it to refer to two different sort of things. As extended in three dimensions the principles are bodies, but they are not tangible as they do not exist by themselves. The bodies in the world are rendered tangible by the activity of the active principle on the passive. That is why there are two diverging definitions of body in relation to the Stoics. One is a mathematical one, which any Platonist would accept as applying to principles, which for the Stoics represents geometrical mathematics as it has the strongest relation to the sensible world. The second is a physical one – “with resistance” – which applies to sensible bodies. The principles are not sensible, though they are corporeal, so the second definition does not apply to them. Pseudo-Galen fails to take into account the complexities of Stoic physics when he used his definition in such a broad fashion. Alexander followed him, or their mutual source, in this polemic as is evidenced by his continued use of a

⁹⁹ *On Incorporeal Qualities* 19.483,13-16 (=L&S 45F = SVF 2.381, part).

simple understanding of body when the *De Mixtione* shows him as capable of much more.

The third objection can be answered by saying, surely, that every quality is its own quality. Whiteness possesses no other quality than that of being white. Besides the notion that quality exists independently is mistaken. Not even god exists independently. But a quality such as whiteness is the result of god acting on matter, not of whiteness by itself acting on matter or a separately existing body.

The fourth objection, as will be explained in section 1.2.3, ignores the point of the Stoic theory of total blending – the theory that allows two bodies to exist in the same place at the same time. This theory, I will argue, has the particular application to god and matter alone or if to be used in response to this argument to matter and quality. The fifth and sixth objections rest on similar misunderstandings that come from using an unsophisticated and non-philosophical understanding of the terms. The qualities are not “chased out”; the qualities are the disposition of the active principle in the passive. The weakness of the arguments here makes it likely that the Stoics are not being actively argued against so much as being targets to argue against for the sake of the examination of the arguments themselves.

The active principle’s disposition in the passive can change, that is all that is happening. The difference of quality is a difference in the *pneuma* that is responsible for the outward appearance of the quality. Nor does this entail that the quality has perished as such. The cause of the quality itself – god – remains and he remains essentially unchanged just as body remains unchanged during alterations.

The Stoics are most often attributed with calling this substance which is the “prime matter of all bodies” *apoiōs ousia*, *to paschon* (the passive), *hylē* (matter) and *aschēmatisistos* (shapeless). In the Latin writers it is often rendered as *essentia* (substance), *substantia* (substrate), *corpus* (body), *silva* (matter). Most of these terms indicate that the substance under discussion is prime; it is after all called unformed and shapeless, substance and substrate¹⁰⁰. There is still the distinction

¹⁰⁰ We should not forget that Cicero was really the first Latin writer to attempt to explore philosophy in his native language and so ambiguity and lack of clarity or expression is to be expected from him and subsequent Latin writers. Cf. Long 1995 and Powell 1995. E&K (1989-99, pp. 292-3) argue that for Posidonius while god was indeed a *pneuma*, as we will see below, the material principle never existed as

between primary and proximate matter but the Stoics are quite clear about this and this will be shown in the next section. The terms that are used here can be considered slightly ambiguous in that not all definitively state that the passive principle does not have any properties. We saw above that the Stoics understand their material principle to be subsumed under the definition of mathematical body. However Sextus Empiricus suggests that *apoiros ousia* is completely devoid of any properties: "The substance of what exists, they [the Stoics] say, since it is without any motion from itself and shapeless, needs to be set in motion and shaped by some cause.¹⁰¹" This thing that needs to be set in motion and shaped can only be *apoiros ousia* as Sextus makes clear a few sentences later: "So, then, the power which moves matter and guides it in due order into generations and changes is everlasting." It is clear that Sextus considers matter for the Stoics to be without any essential qualities. That *apoiros ousia* qualifies as fulfilling the definition of matter used in the preceding section was shown in the words of Calcidius above and has been reinforced here. It is beyond doubt that the Stoics have a material principle of the sensible world that is completely passive, constant in its existence and does not rely on anything else for its existence. But it is also becoming clear that it is not entirely devoid of all characteristics as Sextus would have us believe. On a primitive level it has the property of being passive and being able to be manipulated. On a more sophisticated level we can understand *apoiros ousia* not as a simple and bare "stuff" that Loux and Cohen could criticise as incomprehensible and ludicrously simple, but rather it is a complex body to be understood through the medium of mathematics and mathematical principles. In the first section of this chapter it was noted that *apoiros ousia* is not bare because it is extended in three dimensions. In the present section an explanation for pseudo-Galen's assertion that resistance is to be added to the definition was offered on the basis that the Stoics use the term "body" quite loosely to describe two sorts of things. Bodiliness is clearly of the utmost importance to the Stoics and they define the material principle as body and use a mathematical definition to explain the nature of this body, and if pseudo-Galen is reporting actual Stoic doctrine, add resistance to bodies formed of both the active and passive principles. The Stoics use mathematics to think of the archetypal *ekmageion* because they have come out of the Academy. However while the Academy uses mathematics to understand the very nature of reality the Stoics have

other than the four elements. Though as Rist (1969 pg. 203) points out there is no reason to suppose that Posidonius wished to separate out the active and passive principles so radically.

¹⁰¹ Sextus Empiricus *Against the Professors* 9.75-6 (=L&S 44C1-2 = SVF 2.311, part). (Trans. L&S)

used mathematics to justify their understanding of *apoiou ousia* but then make little further use of it. For Aristotle we noted that he needs incorporeal or intelligible matter to make sense of geometrical objects. The Stoics, I suggest, saw no need for this and building on the geometrical atomism of the *Timaeus* asserted three-dimensional extension as sufficient explanation. If we are to understand the Stoic notion of *apoiou ousia* fully it is therefore necessary to go back to the *Timaeus* and look in general at mathematical principles¹⁰².

In the first section of the present chapter it was thought to be helpful to explore the main alternative to substratum theory: bundle theory. This was because it is always helpful to have an alternative theory in mind to clarify the pros and cons of any idea and also because there is good evidence to suggest that Plato was a bundle theorist about the sensible world and he is very important to the background of the Stoic's material principle. The Stoics are often compared to their contemporaries: the Epicureans. They famously were not believers in a material substrate at all. They were atomists. Now, whether or not the Stoics do not believe in atomism because they do not believe in intra-cosmic void, or whether they do not believe in void because of their rejection of atomism has no bearing here. Either way it is clear that they reject atomism and its implications. But what would prevent them believing that all things were bundles of properties with no underlying matter?

1) Bundle theory implies real universal properties¹⁰³, but the Stoics are against the real existence of universals, Zeno is widely attested to have taught that universals are figments of our soul and not really something¹⁰⁴. But the thought was really codified by Chrysippus who reduced all statements apparently involving universals to logical statements only involving particulars¹⁰⁵, thus forcing a rejection of bundle theory.

¹⁰² The argument for the Stoics' interest in mathematics will be given at the end of chapter 3, after the discussion of the Old Academy.

¹⁰³ Traditional bundle theory requires the actual existence of universals in each bundle. So an object is no more than the sum of a bundle of universal properties, which are the same for each object which partakes of the same property. With no underlying substrate if an individual gains a new quality then it will become a new object, allowing for no persistence through change. It would be difficult in that case to see what really existed at all since no thing aside from the universal qualities would persist and universal qualities, existing in this way, are denied by the Stoics so nothing would exist in a primary way at all. It is possible to hold a bundle theory where objects are made of bundles of particulars but this also suffers from the same problem of persistence over time and through change as well as the issue of indiscernibility. See Armstrong 1980, and 1978.

¹⁰⁴ E.g. Stobaeus 1.136,21-137,6 (= L&S 30A = SVF 1.65), Aetius 1.10.5 (= L&S 30B = SVF 1.65).

¹⁰⁵ Simplicius, *On Aristotle's Categories* 105,8-16 (= L&S 30E = SVF 2.278, part).

2) The Stoics do not rely on matter to act as the principle of differentiation. Instead they rely on quality, and it is possible for two bundles to possess the identical universal properties making two things identical¹⁰⁶; a conclusion which the Stoics would not accept:

One can hear them [the Stoics], and find them in many works, disagreeing with the Academics and crying that they confuse everything by their "indiscernibilities" and force a single qualified individual to occupy two substances¹⁰⁷.

3) While bundle theory can account for change through the alteration or exchanging of quality it is difficult to see basic corporeality as a quality that corporeal things possess, since on the Stoic view all things are corporeal things it becomes like existence: i.e. not a real predicate.

That the Stoics held that only bodies were capable of acting or being acted upon does not compel them to hold the doctrine that there is a material substrate. After all a bundle of properties in the bundle theorists' eyes is still a corporeal object. Rather their whole ontology suggests that bundle theory is not consistent and that a material substrate is necessary.

In common with their predecessors the Stoics thought that the transmutation of elements was not only possible but rather a fundamental aspect of reality. While there are those who try to explain Aristotle's account of elemental transmutation without recourse to primary matter¹⁰⁸ these answers are, in the end, unsatisfactory. In his discussion of who believes in qualityless body as the first matter Simplicius explains why, in his opinion, Plato, Aristotle and the Stoics all believed in Prime matter:

For when first introducing matter by deriving it from change, Aristotle and Plato intend the qualities of the elements to be hot, cold, dry and fluid. Since these qualities have the body as their

¹⁰⁶ Cf. Loux 1998, pg. 235.

¹⁰⁷ Plutarch *On Common Conceptions*, 1077c-e (=L&S 2801) (Trans. L&S)

¹⁰⁸ E.g. H.R. King and Furth.

common substrate they change with respect to it, so that body will be prime matter.¹⁰⁹ (Trans. Sorabji)

He clearly sees considerations regarding elemental transmutation as fundamental to these philosophers, and it is interesting to note that he classes all three together¹¹⁰. King and others have tried to get around this by accounting for elemental transmutation by means of exchanging one of the two qualities that each element possesses¹¹¹. The issue of elemental transmutation is relevant to the Stoics as is shown by numerous texts, including the justification used above by Simplicius. The Stoics clearly make use of the elements and do so in a way that would be familiar to most ancient philosophers. The elements are clearly bodies and are made the elements they are by the action of the formative principle, which I have been referring to as either god or the active. The full relationship of the elements to our topic will be explored in the next section, but for the moment it is worth questioning how elements would be supposed to interact if there were no material principle. The active principle can only impart properties to the elements, and it is the properties of the objects that interact. But they can only interact because they contain a passive aspect and this passive aspect cannot be received from the active principle else the Stoics would contradict their assertion that only body can act *or* be acted upon. This notion rests on the underlying assumption that no body can act on itself. This is the reason the active principle requires the passive principle. The material principle is thus absolutely necessary as part of the explanation of how the elements, and ultimately every subsequent body, can interact.

It has been sufficiently shown not only that the Stoics certainly and unambiguously taught that a material substrate of the type that was described in the first part of this chapter existed, but also that it is integral to their physics. *Apoios ousia* has been shown to lack all definitive qualities being understood only as three dimensional extension which receives properties. We have also seen how both the active and passive principles are to be understood as bodies and how this can be understood,

¹⁰⁹ Simplicius in *Phys.* 227,23-228,20 (= Sorabji Vol.2, 17e.6), this is one of several reasons he gives. The others being that the elements' generation from opposites underlying body is impossible; that qualityless body is irreducible; that Plato needs Primary matter for his account in the *Timaeus*; that really Aristotle should think qualityless body is the substrate and matter else there will be a natural substance which is incorporeal.

¹¹⁰ Although the inclusion of Plato in this group is probably due to Simplicius' being influenced by Aristotle *Physics* 4.2, 209b11-13, which, I will show later, erroneously suggests that the receptacle of the *Timaeus* is an attempt to describe matter.

¹¹¹ An option to be discussed further in chapter two.

and why this would be the case. The next section will build on the work done here and explore further the relationship of matter to god and show how together they account for the world. Later I will show how the two principles are so intimately related that they are said to exist in the same place at the same time, and how this is one of the Stoics' most ingenious concepts.

1.2.2 *Apoios Ousia* and its Relation to the Active Principle:

The nature of prime matter has been established, now its relation to the guiding force of nature will be examined in order to more clearly bring out its role. For, as we shall see, it is in the relationship of the active to the passive that the real understanding of the nature and role of Stoic prime matter is to be found, not in a single examination of prime matter *simpliciter*¹¹². The first two sections of this chapter have suggested the mathematical nature of the passive principle, and the bodily nature of both principles. This section, and the next, will look primarily at the nature of the active principle and how it is that this principle can be understood as bodily too and still perform the function that the Stoics wish. In order to demonstrate the interaction of the active and passive principles this section will be largely concerned with showing that the active principle is also known as *pneuma*. The reason that showing the active principle to be another name for *pneuma* is important is that the majority understanding of *pneuma* is as a compound of fire and air. The issue that this raises is that *pneuma* is taken to represent the active principle, with the result that the passive is understood as the elements earth and water – an interpretation especially prevalent in the ancient world. The issues that prevent the elements functioning as prime matter were noted above and so any picture which supposes that they can act in this way must be wrong. The section following this will discuss the interaction of the principles in more detail by showing how the Stoics argued that two bodies can be in the same place at the same time – their doctrine of total blending. By removing the need for this idea to apply to *pneuma qua* compound, it will be seen that matter is indeed properly understood as a body since the theory of total blending applies to bodies being in the same place at the same time but can only apply to the principles. So, in order to understand the material principle properly it is indeed necessary to discuss and understand the true nature of its correlate: the active principle.

The Stoic active principle is often mentioned along with the passive since the two are constantly conjoined and only conceptually distinct. The active principle is variously characterised as god, reason (*logos*), nature, Zeus, a designing fire (*pyr*

¹¹² The unbreakable bond between active and passive as principles is yet another hallmark of the Stoic debt to Plato.

*technikon*¹¹³), fate and “a breath pervading the whole world¹¹⁴”. These are what the active is called and its attributes are as follows: it is a body¹¹⁵; else it could not act; it is indestructible¹¹⁶ and un-generated¹¹⁷ and at the end of the cosmos’ allotted lifespan god turns everything into fire¹¹⁸, meaning: “[god] has the whole of substance as his commanding faculty; this is whenever the conflagration is in being¹¹⁹”. When the cosmos is in this state it is in complete sympathy with itself and all is a complete unity. The evidence for the nature and importance of the active principle is, if anything, even stronger and more consistent than the reports about the passive principle. This should not be surprising as the acting reason which directs every action in the cosmos and is responsible for its continuing order and eventual destruction would quite reasonably be the focus of more discussion than that on which it acts.

So, what does the active do to the passive? As noted above the passive principle does not actually exist *qua* passive principle, alone and by itself, at any point. It is always endowed with some form. During the time of *ekpyrosis*, when the current, formed, cosmos is not yet in existence, the passive principle is minimally informed in the manner of fire. It happens to be that this most simple of instantiations (simple because it is a single thing as opposed to the myriad complexity of the present world) is when both god and the passive principle are as close to their “pure” forms as they can be. Following generations of philosophers, but strongly in the footsteps of Heraclitus, the Stoics accepted the importance and primacy of fire among the elements. As Stobaeus informs us fire was, for Zeno and Chrysippus, the element *par excellence*:

¹¹³ Aetius 1.7.33 (L&S 46A1 = SVF 2.1027, part) calls god a “designing fire”, a fire that either does not destroy other things in order to sustain itself and creates or else does destroy other things but also creates. On either understanding “designing fire” is a completely different sort of fire from everyday fire, similar only by virtue of its name. Stobaeus tells us the difference between the two types of fire (see note 124 below).

¹¹⁴ Aetius 1.7.33 (=L&S 46A2 = SVF 2.1027, part). (Trans. L&S)

¹¹⁵ Aristocles (Eusebius), *Evangelical Preparation* 15.14.1 (=L&S 45G part, = SVF 1.98, part).

¹¹⁶ Diogenes Laertius 7.137 (=L&S 44F = SVF 2.56, part).

¹¹⁷ Sextus Empiricus *Against the Professors* 9.75-6 (=L&S 44C4 = SVF 2.311, part).

¹¹⁸ Plutarch *On Stoic Self-Contradictions* 1053B (=L&S 46F = SVF 2.605, part), Aristocles (Eusebius, *Evangelical Preparation* 15.14.2) (=L&S 46G = SVF 1.98, part), Origen, *Against Celsus* 4.14 (=L&S 46H = SVF 1.1052, part), Alexander Lycopolis 19,2-4 (=L&S 46I), Eusebius, *Evangelical Preparation* 15.18.2 (=L&S 46K = SVF 2.596, part), Philo, *On the Indestructibility of the World* 90 (=L&S 46M = SVF 1.511, part). Theophrastus too seems to have marked a distinction between two types of fire, see note 160 below for references.

¹¹⁹ Origen *Against Celsus*, 4.14 (=L&S46H, part = SVF 1.1052, part). (Trans. L&S)

The element *par excellence* is so called because the remainder are composed out of it in the first place by alteration and into it lastly everything is diffused and dissolved, but it does not admit of diffusion or resolution into something else. On the basis of this account fire is called an element *sui generis*, since it is not with another one¹²⁰. (Trans. L&S)

In the continuous never ending, nor beginning, cycle of cosmos and conflagration, the world alternates between being in a state when it exists entirely as fire and being as it is now. From the state of conflagration there is a procession by way of condensation into air and thence to water and earth until the present world is formed. This cycle of transmutation then leads to the more developed world we see around us until the force of fire once again overwhelms the other elements and turns them all back into itself. So even at the conflagration, the cessation of the present *cosmos*, the two principles are constantly conjoined. Indeed it is this fact that made Chrysippus reluctant to characterize the conflagration as death:

For since death is the separation of the soul (*psychē*) from the body, and the soul of the world is not separated but grows continuously until it has completely used up its matter (*hylē*) on itself, the world must not be said to die¹²¹. (Trans. L&S)

The active principle is the soul of the "living universe" and the passive principle can analogously be understood to be its body. On the basis of the above passage it seems that at the conflagration god turns everything that exists into something as close to "soul" as is possible. Fire is the most fundamental type of form that matter can possess so it is to this that god reverts when conflagration occurs so that during it he "retires into himself, and is with himself¹²²", the most perfect and divine situation.

We have seen that each cosmic cycle begins its existence as fire and it is through a system of condensation and rarefaction that the remaining elements come into being. This does not happen from a purely mechanical cause but instead it is god who

¹²⁰ Stobaeus 1.129,2-130,13 (=L&S 47A = SVF 2.413, part).

¹²¹ Plutarch *On Stoic Self-Contradictions* 1052c-d (=L&S 46E1 = SVF 2.604, part).

¹²² Seneca *Letters* 9.16, (=L&S 46O = SVF 2.10.65). (Trans. L&S)

directs this action through reason and by necessity. The active principle acts on the passive in the first instance to ensure the instantiation of this fire (*pyr atechnon*¹²³ [non-creative fire] – to be distinguished from the description of god as *pyr technikon* [creative fire]). But in order to be able to do so god must be a body since only body can act or be acted upon. This maxim from Cicero¹²⁴ is most likely intended, in the context in which it occurs, to refer to bodies that exist in the world; that is those that consist of one part of *apoiros ousia* and another of god. However it is clearly one of the Stoics' most basic maxims that incorporeals have no causal efficacy and there is no reason to suppose that this would not be true of the principles¹²⁵. There is, as we saw above, also the statement from Aristocles¹²⁶ to the effect that Zeno taught that the principles were both bodies in distinction from Plato who taught that the active cause was in fact incorporeal. Nemesius reports¹²⁷ arguments allegedly used by Cleanthes and Chrysippus to demonstrate that the soul is a body; and above we saw Chrysippus' own words calling the active principle the "soul of the world". The implication is clear: if "soul" in general is body there is no reason to suppose that the soul of the world will be of a different nature.

As was noted in the previous section there are those who attempt to understand the active and passive principles as being two aspects of a single underlying body¹²⁸. Richard Sorabji¹²⁹ attempts to relegate *apoiros ousia* to a lower level of complexity than god. If, he argues, god is to be viewed as *pneuma* then he must be disposed in a certain way. This is because Sorabji understands *pneuma* itself to be a compound of form and matter¹³⁰. It then follows that what possesses form would in fact belong to the third of the Stoic categories, which would be impossible for a principle¹³¹ as disposition is posterior to, and relies on, the principles. *Apoiros ousia* clearly falls under the first category as it is the substrate of all things in the world. God is a body and so has to fall under the four categories but cannot fall under the first, third or fourth. It then follows that god, as principle of qualification or property giving, is in category two. However this does not make it the case that: "(God in his role as)

¹²³ Stobaeus 1.213,15-21 (=L&S 46D = SVF 1.120, part).

¹²⁴ Cicero *Academica* 1.39 (=L&S 45A = SVF 1.90).

¹²⁵ As we noted Alexander above arguing against the Stoics for holding that qualities are bodies.

¹²⁶ Aristocles (Eusebius), *Evangelical Preparation* 15.14.1 (=L&S 45G part, = SVF 1.98, part).

¹²⁷ Nemesius 78,7-79,2 (=L&S 45C = SVF 1.518, part).

¹²⁸ E.g. Lapidge 1973 argues for an underlying *protē hylē* beneath both *apoiros ousia* and god.

¹²⁹ Sorabji 1988, p. 93-98. Todd 1978 p.140-143 also argues that the principles are to be understood as aspects a single body and so to be themselves incorporeal.

¹³⁰ The nature of *pneuma* will be discussed below.

¹³¹ The four Stoic categories are: 1) substrate (*hupokeimenon*), 2) qualified (*poion*), 3) disposed (*pōs echon*) and 4) relatively disposed (*pros ti pōs echon*).

principle is a compound of matter and intelligence, and is not a simple entity¹³²". On this picture god is not to be viewed as a single breath which permeates the *apoiou ousia* thereby forming it into the cosmos. Instead god becomes a compound within a compound.

This picture leads to several problems, not least one which Sorabji himself points out: that god's existence seems to presuppose that which he is supposed to bring into existence. At p. 96 Sorabji claims that god in his role as cause is incorporeal and so cannot be either the matter on which he acts, the fire or the *pneuma* which he then produces. But the idea that the cause *par excellence* is incorporeal is not supported by any text other than the Suda¹³³ and in any case is categorically opposed to the Stoics' clear preference for corporeal explanations. The clear majority of textual evidence supports the view that there are two distinct, at least conceptually, bodies both of which are principles and one of which acts on the other to create the cosmos. Sorabji's elaborate defence of making god a compound disposed in a certain way acting on himself to form a new compound not only has no textual support but negates any reason for the Stoics' having a theory of total blending, which we will see below can only apply to the relationship of god to matter. He also rejects the idea that *pneuma* is a synonym for god *qua* simple body, but rather still sees it as a compound and so as something formed, which means that it is a combination of form and matter and so posterior to god and the formation of the present cosmos. However as I will show below this conception of *pneuma* as a compound or even as composed of elements at all is false and that it is in fact nothing other than a synonym for god *qua* all pervading life sustaining cause. In summary there are six potential problems with the view that god and matter are aspects of a more fundamental body:

- 1) It could make god incorporeal.
- 2) It could make god a compound.
- 3) It makes god posterior to a cosmic order which he is supposed to be responsible for.
- 4) It makes *pneuma* an element, whether fire or air or a compound of the two.
- 5) It disregards the whole point of there being two principles.

¹³² Ibid, p. 95, which makes god posterior to some other "intelligence" which constitutes part of him.

¹³³ Which has been shown above at page 31-2 to be overwhelmingly outnumbered by texts that support the notion of the two principles as corporeal.

6) It disregards the purpose of the Stoic theory of total blending.

Incorporeals cannot act nor be acted upon. Why then would the Stoics make the active principle incorporeal when by definition it could not then fulfil the very role that it is proposed for? Besides which god, or the active principle, is completely absent from any list of incorporeals which instead includes only place, time, void and "sayables"¹³⁴. God is supposed to be a principle. How can a principle be a compound? It would have to rely on something else to account for its composite nature, negating the assertion that it was in any meaningful way a principle. Further, how could a principle be posterior in any way to that for which it is supposed to be responsible? As will be shown shortly it is likely that *pneuma* is not an element or a compound of elements. *Pneuma* is also unlikely to be a composite of form and matter so any theory which requires it to be so would be mistaken. The theory that makes god a compound of intelligence and matter completely disregards the evidence that god is one of the two principles as the most fundamental Stoic tenet. Demonstrating that the nature of *pneuma* is to be understood as god and not a compound of fire and air will serve to show also that any understanding of the passive principle as earth and water is mistaken. If *pneuma* is god then the passive principle remains a principle and cannot be understood in terms of elements.

The intelligence pervading matter which together would make this god would surely have to count as the active principle, i.e. as the god which it is meant to form half of. The universe is a god, that much is textually supported¹³⁵, but it is not a god posterior to the intelligence and matter which would have to precede it on this picture. The cosmos is a god because god as *pneuma* pervades every part of matter and so there is no part of matter which does not involve god. Finally the theory leaves us with no explanation for the theory of total blending and no explanation of why so many ancient sources ascribe this doctrine to Chrysippus. It will become clear that total blending cannot occur in the cosmos but on the above picture it cannot even occur among the principles since they are in different categories, with god already partaking of total blending. This last point will be discussed in detail in 1.2.3.

It is clear that the active acts on the passive to create the world and that this is possible because both principles are bodies. But it does not act as Plato's demiurge

¹³⁴ E.g. Sextus Empiricus *Against the Professors* 10.218, (=L&S 27D = SVF 2.331, part).

¹³⁵ E.g. Diogenes Laertius 7.137 (=L&S 44F = SVF 2.526, part).

does on a literal reading of the *Timaeus*, from the outside: moulding like a sculptor or potter¹³⁶. Instead, true to Chrysippus' description of it as soul, the active moulds the passive from the inside. But again it does not sit inside the passive like water in a jug, nor does it sit next to it like a mixture of beans and rice. Instead it completely blends with the passive: "They [the Stoics] say that god is mixed (*memichthai*) with matter (*hylē*), pervading all of it and so shaping it, structuring it, and making it into the world.¹³⁷" This view, that two bodies can be in the same place at the same time, came under attack in the ancient world but below I will demonstrate that these attacks were misguided and that the Stoic theory of total blending (*krasis di'holou*) had only one use and a very important one at that.

But in what guise can the active be said to pervade the passive in its entirety so that there is no part of the passive which does not also contain the active? It is true to say that the active pervades as reason (*logos*), however reason is more strictly a disposition of a body – soul qualified in the archetypal reasoning way. The body that is god is indeed disposed in the archetypal rational way but what way is that? The Stoics designate the permeating rational active principle *pneuma* – breath: "The Stoics made god out to be...a breath (*pneuma*) pervading the whole world.¹³⁸" The term *pneuma* is the source of much discussion and gets the Stoics into more problems than they probably wanted or even envisaged. However most of the issues that are raised against the concept of *pneuma* in Stoicism rest on the mistaken assumption that for the Stoics *pneuma* is a compound of fire and air: "But how will the substance of corporeal qualities manage to consist of breath, when breath itself is composite?¹³⁹" In looking at the near contemporary uses of *pneuma* in the philosophical tradition and in medicine I will show that *pneuma* is in fact just another term for the Stoics' active principle which is variously categorized as air or fire or a mixture of both qualities. The cause of this will be seen to be most likely because of the way it acts and because that is how other people, doctors and philosophers, were using it and not because it is in fact such a compound.

For Aristotle the term *pneuma* is closely linked to life itself. It is what makes semen hot and is to all intents and purposes the substance responsible for guiding the

¹³⁶ Though of course many Platonists, such as Speusippus and Xenocrates as we will see later, conflated the demiurge and world-soul.

¹³⁷ Alexander of Aphrodisias *On Mixture* 225,1-2 (=L&S 45H = SVF 2.310, part). (Trans. L&S)

¹³⁸ Aetius 1.7.33 (=L&S 46A, part = SVF 2.1027, part). (Trans. L&S)

¹³⁹ Simplicius *On Aristotle's Categories* 217, 32-218, 1 (=L&S 28L3 = SVF 2.389, part). (Trans. L&S)

motive power of the semen to manipulate the matter supplied by the woman into the form of a child. At *De Anima* I.2.405b3 Aristotle criticizes those, he names Hippo, who claim the soul to be water on the basis that semen is liquid. The implied mistake is taking the material non-rational or non-directing part of the semen as the important part over its heat and frothiness: attributes which should be ascribed to *pneuma*. In his *On the Generation of Animals* 727a25 Aristotle asserts the proposition that since the woman does not contribute semen to the embryo she contributes nothing positively to form and that any resemblance of the child to the mother is due to deficiency in the power of the male forming principle, i.e. the semen, to overwhelm and structure the matter that is the mother's contribution¹⁴⁰. What this tells us about *pneuma* in the pre-Stoic generation of Aristotle is that it was already conceived of as a directing principle intimately linked to life, reason and responsible for ordering aspects of the world. If this is true of an individual human being then it is only reasonable to suppose, on the basis of the Stoics' habit of moving from micro to macrocosm, that the same would be true of the living world as a whole. However Aristotle does not explicitly tell us what the constituents of *pneuma* for him are. But at *On the Generation of Animals* 736b37-737a2¹⁴¹ he gives us a clue as to what *pneuma* might in fact be:

In all cases the semen contains within itself that which causes it to be fertile – what is known as “hot” substance, which is not fire nor any similar substance, but the *pneuma* which is enclosed within the semen or foam like stuff, and the natural substance which is *pneuma*; and this substance is analogous to the element which belongs to the stars. (Trans. Peck)

There are two interesting points to be taken from this passage.

- 1) *Pneuma* can be called “hot” without it necessarily being the same as (or even constituted of) the hot element – fire;
- and
- 2) *Pneuma* is likened to the substance of the stars.

¹⁴⁰ Lack of resemblance to the father is due to privation not due to a positive influence from the mother.

¹⁴¹ In *On Fire* 44 Theophrastus seems to follow Aristotle in drawing an analogy between the heat of the heavens and that of animals.

Point 1 implies that *pneuma* can be responsible for the hot and foamy nature of semen without being either of the elements associated with these characteristics; in other words *pneuma* is not air though it is in fact air-like, nor is it fire even though it is hot. Point 2 says that *pneuma* is like the substance of the stars¹⁴². So what for Aristotle is the substance of the stars and what could the substance of *pneuma* be if it is to be analogous to it? The substance of the stars is *aether* for Aristotle¹⁴³ which for him is characterized as a separate element from fire but for others can be understood as the purest fire¹⁴⁴.

We already noted how *pneuma* makes the semen hot and that it is the vitalising force because heat is self-moving. Combined with a statement that it is analogous to the *aether* we can conclude that while it may not be elemental-fire proper it is certainly fiery¹⁴⁵ in some way. Solmsen¹⁴⁶ argued forcibly that there was no relationship between the Stoa and the Lyceum, but such a strong assertion, while appealing due to its daringness, nonetheless defies credibility¹⁴⁷. Zeno seems to have accepted that the nature of soul was special and called it "*pneuma enthermon*" according to Diogenes Laertius¹⁴⁸. It is strange for him to call it "warm breath" since:

1) if *pneuma* is a compound of fire and air, warmth is presumably a redundant epithet; and more importantly;

2) he actually thought of the soul simply as fire instead as Cicero reports¹⁴⁹.

¹⁴² It should be noted that the stars for Aristotle are self-moving in the sense that they direct themselves to imitate the Unmoved mover, so it is in a sense reasonable to equate the stuff of the soul for the Stoics to the nature of self-moving objects.

¹⁴³ Fire's natural movement is up, yet at *De Caelo* 2.6.289a11-17 he says the motion of the stars is circular because of what they are composed of, and that this substance must be like fire since it causes light by friction. Cf. *Meteorologica* 1.3.340a18-340b31. However for Aristotle the *aether* is not itself hot. The heat felt from bodies in the heavenly sphere, i.e. the sun, is generated by friction of the sun's emanations on its way here. But what is important to note is the precedence and since the Stoics are not followers of Aristotle at all they are more free to adapt his teachings in the way they see necessary for their own end.

¹⁴⁴ Aristotle saw ancient precedent for *aether* being a term for the heavenly sphere and *prime body* – *De Caelo* 1.3.270b21-25, where he also criticises Anaxagoras for misusing the term *aether* by making it equivalent to fire, cf. *De Caelo* 3.3.302b4-5, *Meteorologica* 1.3.339b24, 2.9.369b14.

¹⁴⁵ Hence Anaxagoras' misapplication of *aether* as a synonym for fire, see note 35 above.

¹⁴⁶ Solmsen 1986.

¹⁴⁷ Indeed as L&S pg 292 point out the Stoic arguments about mixture seem to be formulated in direct response to Aristotle *On Generation and Corruption* 1.10.

¹⁴⁸ Diogenes Laertius 7.157. The same terminology is ascribed to Posidonius at Aetius *Placita* 1.7.19 (Stobaeus *Eclogae* 1.1.29b = 1.34.26 W = *Dox. Gr.* 302.19 = fr. 101 E&K).

¹⁴⁹ See below note 153.

Fire is clearly not *pneuma*. I would propose then that Zeno understands the soul as fire because he understands the soul to be an off-shoot of the divine nature. The divine nature is best understood as fiery. But as we have seen the fire of god is different from that of the element fire. In order to clarify this distinction it seems reasonable to suppose that Zeno appropriated the fairly common notion of *pneuma* as a description of the soul and attempted to emphasise its divine nature by calling it “hot”. Ironically, owing to the fact that we do not have Zeno’s writings on the matter and the polemical nature of much of the surviving evidence, Zeno’s attempt to clarify the position has resulted in much confusion. *Pneuma* for Zeno, as for his followers, is in fact a single thing. Moreover it is the term that god should be called when we refer to the divine power within ourselves. This is indeed quite a speculative interpretation to foist onto the founder of Stoicism. But there is good reason for supposing that even if Zeno himself did not make these notions explicit that they were clear enough for Chrysippus to build on.

The literal understanding of the soul as fire, if Zeno made the ascription, can be explained as just a rough approximation as Aristotle states:

For some writers assert that the soul is fire or some such force. This, however, is but a rough and inaccurate assertion; and it would perhaps be better to say that the soul is incorporate in some substance of a fiery character. The reason for this being so is that of all substances there is none so suitable for ministering to the operations of the soul as that which is possessed of heat¹⁵⁰.
(Trans. Ogle, with amendments)

As we will see this explanation of Aristotle’s, that heat is a way of understanding the operations of the soul, explains the Stoic appeal to *pneuma* as soul. When Zeno claims that the soul is “warm breath” he is characterizing the soul in its two most important ways: 1) breathy – permeating, and 2) fiery – vitalising. These characteristics need not for Zeno, any more than for Aristotle, be necessarily tied to elements alone.

¹⁵⁰ Aristotle *On the Parts of Animals* 2.7.652b7-12.

This is borne out by Cicero's reports that Zeno rejected a fifth element¹⁵¹. Instead his binding force seems to have been fire pure and simple:

His (Zeno's) views as to the natural substances were as follows. First, in dealing with the four recognised primary elements he did not add this fifth substance which his predecessors deemed to be the source of sensation and of intellect¹⁵². (Trans. Rackham)

Zeno's "predecessors" seem to be ascribed the doctrine that the soul, or the stuff of the soul, is the fifth element, but not Zeno:

Now in the whole of this branch of philosophy, on most of the important points the Stoics followed the Peripatetics, maintaining that the gods exist and that the world is composed of the four elements. Then, coming to the very difficult question, whether we are to believe in the existence of a fifth substance, as the source of reason and intellect, and also the connected further question which element constitutes the soul, Zeno declared this substance to be fire¹⁵³. (Trans. Rackham)

While here we are told that Zeno rejected a fifth element but instead claimed that the soul was simply fire, Zeno need not appeal to a fifth element as we will see but is again just fixing on one of the roles and characteristics of the soul. I would suggest that Zeno, as so many ancient philosophers, could have been engaging in some word play. By fire he is not referring to ordinary fire, but to the divine fire – a reference that would be missed by the uninitiated. Theophrastus, whose lectures it is possible Zeno attended, is reported by Huby¹⁵⁴ to have tried to get out of apparent contradictions to Aristotle by explaining that confusion will not arise if we understand the different ways in which words are used. It is possible that Zeno is following this

¹⁵¹ Theophrastus' position is not clear on this topic and his discussions could have influenced the young Zeno in rejecting the fifth element. See Sharples 1998 (vol. 3.1 pp. 88-94) for a discussion of the main points regarding Theophrastus.

¹⁵² Cicero *Academica* 1.39

¹⁵³ Cicero *Fin.* 4.12.

¹⁵⁴ FHS&G vol. 4. Pg. 56.

mentality and sees no problem in using a common word since he knows what he means and so will his pupils¹⁵⁵.

Cicero elsewhere, and Diogenes Laertius, tells us that Cleanthes and Chrysippus used the term *aether*. But there are strong indications that the term is not being used to designate a separate element as such but rather is yet another name for the active principle:

Cleanthes, who attended Zeno's lectures at the same time as the last named, at one moment says that the world itself is god, at another gives this name to the mind and soul of the universe, and at another decides that the most unquestionable deity is that remote all-surrounding fiery atmosphere called the *aether*...¹⁵⁶
(Trans. Rackham)

Cleanthes here is clearly said to identify god with the *aether*, this ascription should not strike us as strange since we saw earlier that the active principle is called *pyr technikon* – a designing fire. It seems perfectly reasonable to adopt as a synonym for this *aether* whose association with light and purity needs no introduction. Similarly for Chrysippus:

Chrysippus...the purest part of the *aether*; this they say, as primary god, passes perceptibly as it were through the things in the air and through all animals and plants, and through the earth itself by way of tenor.¹⁵⁷ (Trans. L&S)

Chrysippus follows his teacher in identifying god with this *aether*, which also explains why at *ekpyrosis* he claims the world to change into light¹⁵⁸: "At the conflagration the world...must either change into flame, as Cleanthes thought, or into light, as

¹⁵⁵ Indeed I have made the same supposition on the equivocal use of words in the preceding section in relation to body.

¹⁵⁶ Cicero *On the Nature of the Gods* I. 37

¹⁵⁷ DL 7.139 (=L&S 470.4 = part SVF 2.634).

¹⁵⁸ Huby 1999 pg. 55 in her commentary on Theophrastus' psychology takes Priscian *Paraphrase of Theophrastus' Discourse On the Soul* (fr. 278 FHS&G) 9.34-10.1 as implying that Theophrastus saw heat and light as analogous. This is an interesting precedent if Chrysippus understood the *ekpyrosis* as god existing in his pure form, in this case light, but also accepted the name of *pyr technikon* for him.

Chrysippus supposed.¹⁵⁹ Chrysippus takes the use of *aether* one step further than his teacher. If there were any further qualms about identifying god with *aether* and so *aether* or god with *pneuma* then we need look only to a report of Aetius' where he tells us that:

The Stoics made god out to be intelligent, a designing fire (*pyr technikon*) which methodically proceeds towards creation of the world, and encompasses all the seminal principles according to which everything comes about according to fate, and a breath (*pneuma*) pervading the whole world, which takes on different names owing to the alterations of the matter through which it passes¹⁶⁰. (Trans. L&S)

God is characterized in two ways here: *pyr technikon* and *pneuma* and Aetius even hints at why: "takes on different names owing to the alterations of the matter", god *qua* driving force and rational principle is a fire, but *qua* that which pervades all things he is *pneuma*. Why the change of term when it comes to god's ability to pervade through all things? Firstly it is simply easier to conceive of breath permeating all things than it is fire but secondly there is the pre-Socratic precedent of Air being divine and permeating all things:

And it seems to me that that which has Intelligence is that which is called Air by mankind, and further, that by this, all creatures are guided, and that it rules everything; for this in itself seems to me to be God and to reach everywhere and to arrange everything and to be in everything. And there is nothing which has no share of it¹⁶¹.

There is here an explicit and well known precedent of seeing god as an all pervading breathy substance which rationally directs all things by means of immanent direction.

¹⁵⁹ Philo *On the Indestructibility of the World* 90 (=L&S 46M = SVF 1.511, part). (Trans. L&S) "Light" could also be little joke on Chrysippus' part since at the conflagration god would be all alone and hence wise or "enlightened".

¹⁶⁰ Aetius 1.7.33 (=L&S 46A = SVF 2.1027, part), cf. Stobaeus 1.213,15-21 (= L&S 46D = SVF 1.120, part).

¹⁶¹ Diogenes of Apollonia Fr. 5, Diels (From Simplicius *In Phys.*, 152, 22-30 = Fr. 603 KRS). The passage continues making the identification of heat with intelligence, an interesting precedent for the Stoic use of *pneuma* as another term for their fiery god.

However it is quite reasonable for the Stoics to move away from air as the substance of god and replace it with something fiery since fire is the self-moving and self-sustaining element it is reasonable to see it as divine. However it clearly cannot be the element fire which is the substance of god since the elements, as we saw above, are posterior to god and matter that is why we find god characterized as a designing fire as opposed to the elemental and destructive fire. It seems likely that this terminology changed from *pyr technikon* to *aether* in order to further distinguish it from the element and to make the divine nature of it¹⁶² more apparent through *aether's* close association with the heavenly bodies¹⁶³.

The philosophical tradition has furnished us with an understanding of how and why Zeno's immediate successors could and would have adopted the term *aether* and how such an all permeating principle of rationality and life could relate to *pneuma*. But the philosophers were not the only ones to use the term *pneuma* and indeed they probably took it from the medical schools, namely the *pneumatic* school in Sicily. How was the term *pneuma* used by the medical community and what relation would this community have with the early Stoics¹⁶⁴?

It is possible that either Diogenes of Apollonia or Empedocles is the originator of the *pneumatic* theory in medicine¹⁶⁵. Either way it was certainly present in the teachings of Philistion, a contemporary of Plato's, and it is probably from him and Diogenes that *pneuma* found its way into Aristotle¹⁶⁶. Alcmaeon, a pre-Hippocratic doctor, is said to be responsible for the long running medical view in Greek thought that the arteries do not carry blood but instead *pneuma*¹⁶⁷. What is this *pneuma* doing and how did it get there? There seems to be little information about how Alcmaeon accounted for the presence of *pneuma* in the body but it must be either innate or brought in from outside. Empedocles seems to have been the first to posit an innate

¹⁶² Posidonius reportedly called *aether* "divine" cementing this interpretation: Macrobius, *Saturnalia*, 1.23.7 (Cornificius) = (fr. 24 E&K).

¹⁶³ A point that Gould 1970 makes quite strongly at p. 120 where he argues that *aether* is not to be understood as a fifth element but as a term for god citing Diogenes Laertius 7.138-9 (=L&S 470 = SVF 2.634) in support.

¹⁶⁴ Discussion of the relationship of medicine to philosophy will continue in chapter 4.

¹⁶⁵ However since Alcmaeon talks of *pneuma* and he pre-dates both Empedocles and Diogenes of Apollonia the credit surely should go to him; not-withstanding the possibility that none of these are responsible for the term.

¹⁶⁶ Longrigg 1993, pp. 80.

¹⁶⁷ Op. cit. pp. 62. Miller 1949, pg. 310 argues that Alcmaeon was somehow strongly connected to the Pythagoreans and shared their notion of opposites as generative principles. That opposites will always be two in number and that the Stoic principles are also opposites is also an interesting note of further relation of Alcmaeon to Stoic thought.

heat, building on the works of Parmenides and his association of life with heat and death with cold. Philistion¹⁶⁸ and Diogenes¹⁶⁹ also accepted this idea of innate heat and passed it on to the philosophical schools, most likely through Plato¹⁷⁰.

But there seems to be no real explanation of what it is that *pneuma* is in these theories. "Breath" is not a particularly helpful answer to the question of its nature. It does, though, partly answer the question of what its function is. It is generally taken, by Empedocles, Diogenes and Aristotle that the purpose of respiration, the drawing in of breath, is to cool the innate heat¹⁷¹. To this end Aristotle thought of the brain as a sort of refrigerator cooling the innate heat¹⁷². Empedocles, Diogenes and Philistion all seem to have accepted that the innate heat or *pneuma* is transferred to the foetus via the semen. It is truly innate for them. It was noted above that Aristotle criticised Hippo for taking the wetness of semen as indicative of the souls' nature as being likewise wet, Diogenes having already accepted that the principle is air took the semen's aeriform nature as indicative of innate breath. This idea of *pneuma* as air pure and simple does not seem to have changed in medicine or philosophy except in Aristotle where he says that its substance is analogous to that of the stars.

The Hippocratic text *On Breaths* uses the terms *pneuma*, air and *phusa* (gas) interchangeably. *Pneuma* appears to be a general term for both air and gas. While air is that which is outside the body and gas that which is within. It is clear then that at least for the author of that text *pneuma* and air, just as for Diogenes, are synonymous terms and can be used depending on the circumstances. In Greek medicine from Empedocles to Erasistratus *pneuma* is taken as the vitalising principle the cause of movement and the absence of which is death. It is not hard to see the attraction of a popular and expressive medical view among philosophers with a materialistic, and proto-scientific, attitude to the world. Medical analogy is not new to

¹⁶⁸ Cf. Longrigg 1993. pp. 73-4 where the purpose of breathing is to cool the innate heat.

¹⁶⁹ Ibid. pp 77-80, cf. *D.K.* 68A140.

¹⁷⁰ *Phaedo* 96b could refer to Alcmaeon and his theory of the brain as the organ of sense of perception and thence of knowledge. Miller 1949, pg. 311 argues that Aristotle's theory of perception owes much to Alcmaeon. As a result Alcmaeon can be regarded as a pivotal figure in the history of the relation of medicine to philosophy. *Timaeus* 62a-b suggests some sort of innate heat or at least that heat is related to health.

¹⁷¹ As Phillips 1973 pg.48 points out *pneuma* could be seen as a forerunner of our oxygen.

¹⁷² Aristotle *On the Parts of Animals* 2.7.652b26; 653a2-4; 2.10.656a22. It is also interesting to note that the Stoics followed Empedoclean thought in making the heart the seat of consciousness rather than the brain as Alcmaeon had taught.

the Stoics. For the active principle to be characterised as *pneuma* fits very well with its role as sustaining the cosmic order¹⁷³.

We have seen from the philosophical tradition in Aristotle that *pneuma* is a hot breathy substance responsible for life and sensation but that despite these characteristics it is not to be understood as air but instead as a substance analogous to that of the stars. We also saw that the influence of Diogenes of Apollonia with his emphasis on the divine nature of air did not stop with philosophy but clearly had some impact on the medical tradition. It is most likely from him that the airy nature of *pneuma* came to be emphasised over its heat leading to the conclusion that *pneuma* may be hot air, but air it is nonetheless. What this discussion has shown is that *pneuma* as conceived of outside of Stoicism was a single substance whether it be one “analogous to the substance of the stars” or air, but there are several reports that state “the Stoics”, seemingly alone among the ancient schools, believed *pneuma* to be a compound of fire and air. It is to these that our attention will now move.

Calcidius reports Chrysippus’ own words in relation to the sustaining and sensory power of the body, i.e. the soul:

It is certain that we breathe and live with one and the same thing.
But we breathe with natural breath. Therefore we live as well with
the same breath. But we live with the soul. Therefore the soul is
found to be natural breath¹⁷⁴. (Trans. L&S)

Here we come across what claims to be a verbatim use of the term *pneuma* in one of the early Stoics. If Chrysippus did in fact use the term breath to characterize the soul then it is highly likely that he used the same term to describe the active principle since as we saw above he refrained from calling *ekpyrosis* death since it does not involve the separation of the cosmic soul from its body. Shortly before he quotes Chrysippus’ *On Tenors* Plutarch describes these tenors as currents of air. These

¹⁷³ The same conclusion is reached by Gould 1970 where he says that: “And this dynamic quality character of *pneuma*, contraposed as it is here to the inert matter without quality, probably led Chrysippus to assume that the *pneuma* and the active power in the universe were one and the same thing. But none of the fragments makes such an identification explicit.”

¹⁷⁴ Calcidius 220 (=L&S 53G part (1-6) = SVF 2.879 part). Theophrastus (fr. 346 FHS&G) suggests that we have innate heat and keep it by not breathing too much of it out. If we faint it is because we have lost too much and cold water will ensure revival as it will spur the innate heat back into action.

sustain bodies and are responsible for their qualities such as hardness, softness and whiteness. Plutarch then goes on to say:

Yet they maintain that matter, which is of itself inert and motionless, is everywhere the substrate for qualities, and that qualities are breaths and aeriform tensions which give form and shape to the parts of matter in which they come to be¹⁷⁵. (Trans. L&S)

This reinforces the idea that *pneuma* can function as another term for the active principle since it pervades an "inert and motionless" matter which immediately calls to mind the passive principle. It is also important to note that Plutarch refers to the quality giving substance as "breath" and "aeriform" and that in the passage quoted from *On Tenors* Chrysippus refers to it as "sustaining air" which it would not be too unreasonable to interpret as being as different from elemental air as creative fire is different from non-creative fire. Plutarch and Calcidius both ascribe a doctrine to Chrysippus, using his own words, that makes out the soul of man and hence of the world to be an aeriform breath, not a compound¹⁷⁶.

As for Cleanthes, Cicero's Stoic spokesman Balbus in *On the Nature of the Gods* ascribes to him the doctrine that heat is the sustaining principle of all things: "the element heat has within itself a vital power which pervades the whole world."¹⁷⁷ He goes on to say that the world must be held together and nurtured by a like element: "and all the more so because it must be understood that this hot and fiery entity is extended in every nature." Cleanthes is clearly being said to hold that something like fire sustains the world and animals. He has chosen fire over breath since our veins "pulsate by a flame-like movement"¹⁷⁸ and an animal's heart beats rapidly like a flame when torn from its living body. Balbus also gives the traditional reason for ascribing to fire the role of soul and of what sustains that it is: "roused and activated by its own movement"¹⁷⁹. Cleanthes does not seem to have used the term "breath" else it is reasonable to assume that Cicero would have too. What we gain from this

¹⁷⁵ *On Stoic Self-contradictions* 1054A-B (=L&S 47M2 = SVF 2.449, part).

¹⁷⁶ If we understand the air we breath to be "aeriform" as seems reasonable.

¹⁷⁷ *On the Nature of the Gods* 2.24 (=L&S 47C2). (Trans. L&S)

¹⁷⁸ *Ibid.*

¹⁷⁹ *On the Nature of the Gods* 2.23(=L&S 47C1).

interesting passage is the assertion once again that the sustaining principle is a single unified substance.

Alexander spends a significant part of his *On Mixture* criticising “the Stoics” for holding that *pneuma* is composed of a compound of fire and air the resulting tension of which, a vacillating in-out motion, is supposed to hold the object together and in sympathy with the world. But he fails to ascribe this view to any Stoic in particular and certainly not to one of the three early heads of the Stoa. However Galen in his *On Hippocrates’ and Plato’s Doctrines* reports of Chrysippus the following:

This breath possesses two parts, elements or conditions, which are blended with one another through and through, the cold and hot, or if one wished to describe them by different names taken from their substances, air and fire¹⁸⁰. (Trans. L&S)

It seems that we have here evidence of Chrysippus teaching that the “sustaining air” is a compound of fire and air just as Alexander would later report. But how accurate are these reports? There are other reports, from Plutarch¹⁸¹, Galen¹⁸² and Nemesius¹⁸³ that assert that air and fire are the active elements and water and earth are the passive. However none of these name any Stoic in particular but are attributed to “the Stoics” in general; we have no way of telling to which stage in the school’s development this supposed doctrine is meant to apply. When Nemesius says: “The Stoics say that some of the elements are active and others passive: air and fire are active, earth and water passive¹⁸⁴”, others have taken the implication to be that fire and air make up the active principle while earth and water constitute the passive. This is clearly how pseudo-Galen takes the idea: “the breathy substance is

¹⁸⁰ 5.3.8 (=L&S 47H, part = SVF 2.841, part). Galen seems to be making the link between the “cold and hot” to the elements air and fire all by himself and not appealing to a Stoic text or other Stoic authority.

¹⁸¹ *On Common Conceptions* 1085C-D (=L&S 47G = SVF 2.444, part), although interestingly in his *On Stoic Self-Contradictions* 1053F-1054B (=L&S 47M = SVF 2.449) Plutarch says that “matter” is motionless and that the cause of qualities are “breaths”. If we take “matter” to refer to prime matter then Plutarch is offering a picture similar to the one that is described in this chapter of the thesis.

¹⁸² In his *On Hippocrates’ and Plato’s doctrines* 5.3.8 (=L&S 47H = SVF 2.841, part) Galen claims to be reporting Chrysippus’ position on the passivity of earth and air truthfully and clearly as well as the doctrine that the soul (a breath) is constituted by a mixture of the “cold and hot”. Galen takes “cold and hot” to be equivalent to air and fire, and it is this false equivocation that I believe leads him to claim on behalf of Stoicism the position that total blending occurs in the world.

¹⁸³ Nemesius 164, 15-18 (=L&S 47D = SVF 2.418) is emphatic in his ascription of the passivity of certain elements to the Stoics.

¹⁸⁴ *Ibid.*

what sustains, and the material substance what is sustained. And so they say that air and fire sustain, and earth and water are sustained.¹⁸⁵

But this seems to be a *non sequitur*. Fire and air can be classed as active for no other reason than because both of these elements appear to be self-moving; water and earth have a history of being classed as passive and inert, relying on something external for their motion¹⁸⁶. The referent for “material substance” would most likely be, after all, not elemental but *apoiós ousia* – the prime matter. The correlate to this is a breathy substance but this breathy substance is none other than the active principle – god, just characterized in a novel way, i.e. no longer as *pyr technikon*. There appears to be confusion among commentators of the Stoics as to who actually held that *pneuma* is a compound of fire and air and over the meaning of the active nature of fire and air. What has happened? I agree with Todd when he answers this question saying:

The reports that distinguish the four elements into active or “tensional” (fire and air), and passive or “tensionless” (earth and water) pairs results, I suspect, from a common confusion about *pneuma*’s relation to the elements, and a failure to identify its qualities of heated air in terms of the properties of *aither* rather than two of the four stratified elements¹⁸⁷.

Why and how such confusion could have arisen are impossible questions to answer but it does not seem unreasonable to assume that perhaps some post-Chrysippean Stoics failed to grasp the correct message of their school’s teaching and so inadvertently ushered in a period of erroneous criticism, or more likely, that confusion arose from diverse traditions about *pneuma* one taking it as primarily fiery as from Aristotle, and the other as airy from Diogenes.

¹⁸⁵ *On Bodily Mass* 7.525,9-14 (=L&S 47F = SVF 2.439).

¹⁸⁶ See chapter 4 for a more detailed discussion of water imagery and prime matter.

¹⁸⁷ Todd 1978. p. 153. Sorabji 1988 p. 86-89 also supports the position that *pneuma* is not a compound of fire and air on the basis that the language used by Alexander and Galen (note 71 above) is quite reticent and involves supposition and not the direct evidence of a Stoic text. However he then takes *pneuma* to be an ambiguous term alternately applicable to air or fire or *aether* depending on the function that the Stoics expect it to perform at any given instance. But this seems needlessly complicated and would require that air and fire are able to fulfil the same purpose in terms of disposition, which given the otherwise exalted state of fire over the other elements is unlikely.

In the next part we will see how such a description of *pneuma* as being a compound of fire and air leads to absurdity in terms of the theory of total blending and this combined with the evidence above will demonstrate how such a position could not have been that of Chrysippus or the other early Stoics.

1.2.3 Blending Through and Through:

In his *On Mixture* Alexander of Aphrodisias criticizes the Stoics at length for holding that two bodies can be in the same place at the same time. Since Alexander is an Aristotelian this view is particularly abhorrent to him¹⁸⁸, while a writer like Plutarch would object perhaps more on the grounds of its being contrary to common sense.¹⁸⁹ Despite the large amounts of polemical writings dismissing the notion of two bodies in the same place the notion carried on after Stoicism. The Neo-Platonists argued that two bodies can be in the same place, while also arguing that the Stoics were mistaken in their position. Some¹⁹⁰ argued that bodies can be in the same place at the same time if one lacks prime matter. If one body lacks prime matter then it lacks the ability to be divided and so can pass right through each other without dividing each other. However this understanding cannot apply to the Stoics since the absence of prime matter in a body would have the consequence that the body is incorporeal. Arguing that an incorporeal body can be in the same place at the same time as another body, whether corporeal or incorporeal, clearly has no relevance to the Stoics as the incorporeal is not a real existence. Alexander clarifies the issue of mixture involving corporeal bodies by offering the following definitions:

Chrysippus has the following theory of blending: he first assumes that the whole of substance is unified by a breath which pervades it all, and by which the universe is sustained and stabilized and

¹⁸⁸ Aristotle discusses types of mixing at length in his *De Gen. et Corr.* 1.10.327a30-328b24. Later at 2.7.334b8-335a9 Aristotle discusses how all compound bodies are made from combinations of the elements in mixture so that bodies can alter by the reduction or addition of the properties of the elements. It is interesting to consider the notion that Aristotle agrees with the mixture of elements but that Alexander finds the same idea in Stoicism so ridiculous owing to the notion that on his interpretation the Stoics require the elements to be in the same place at the same time. It would not be unreasonable to suppose that a part of what Alexander is doing is distancing Aristotle from Stoicism (though Todd thinks – most likely rightly – Alexander is using the Stoics to represent non-Aristotelian perspectives, and that it is the Aristotelian debate that is his main concern) and so uses any tool available, even misinterpretation. In his *De Anima* Aristotle makes the point (418b14-20) that light is not fire, or a body or from a body since it would then itself be a body. He rejects the notion of light as fire or another body on the basis that two bodies cannot be in the same place at the same time.

¹⁸⁹ That Stoicism and the Stoics in general are so contra-common sense seems to be one of Plutarch's main criticisms.

¹⁹⁰ Syrianus in *Metaph.* 85,15-28 (=Sorabji vol. 2, 20e1) explains that for those who accept two bodies in the same place, such as light (i.e. the Neo-Platonists), that they do so on the basis that these bodies are immaterial and so there is no resistance to get in the way of their mixing. Proclus, in *Remp.* 2.162,20-163,9 (=Sorabji vol. 2, 20e13) argues that two bodies can clearly pass through each other, provided that at least one is immaterial. By matter he means "what is basic and the substrate of the basic bodies." That which is immaterial clearly does not partake of prime matter in that case. It seems fairly clear that these later discussions of the question of two bodies in the same place do not really relate to the Stoics, except to show that the notion that two bodies can be in the same place at the same time is not quite so contrary to common sense as some commentators would have us believe; however much the notion of an immaterial body is contrary to common sense.

made interactive by itself. Then, as for the bodies mixed together in this substance, he argues that some mixtures occur by juxtaposition of two or more substances put together in the same place, and juxtaposed with one another "by joining", as he says, while they each preserve their own substance and quality at their surface contact in such a juxtaposition...Other mixtures occur by through-and-through fusion of the substances themselves and their intrinsic qualities, which are destroyed together, as he says happens in the case of medical drugs when the things mixed together undergo mutual destruction and another body is generated out of them. Other mixtures occur, he argues, when certain substances and their qualities are mutually coextended through and through, with the original substances and their qualities being preserved in such a mixture; this kind of mixture he calls specifically "blending";...for the capacity to be separated again from one another is a particularity of blended substances and this only occurs if they preserve their own natures in the mixture. He tries to support the existence of these different mixtures through common conceptions.¹⁹¹ (Trans. L&S, with amendments)

Although Alexander is here criticizing Chrysippus for his view of mixture it is not unreasonable to assume that the theory predated him, though perhaps not by many years. The position that two bodies can occupy the same place at the same time is, after all, attacked by Arcesilaus¹⁹², an older contemporary of Chrysippus'. But it is likely that the idea of total blending found its first real codification with Chrysippus as well as its function of explaining the interaction of *pneuma* with matter rather than the "vital heat" of his contemporaries. Alexander here states that Chrysippus thinks the universe is sustained and harmonized by an all pervading cosmic breath. Further, he states that within the cosmos the main types of mixture are juxtaposition and fusion as in the cases of beans and wheat and of mixing paint respectively. The final

¹⁹¹ Alexander of Aphrodisias *On Mixture* 216.14-217.3. (= L&S 48C, part = SVF 2.473, part).

¹⁹² Plutarch *On Common Conceptions* 1078B-D (= L&S 48E, part = SVF 2.465, part), mentions Arcesilaus' criticism of the Stoic theory of total blending: "This is the point presumably at which the leg made famous in Arcesilaus' lectures arrives stamping with derision on their absurdities. For if blendings are through and through, what prevents not only the armada of Antigonus, as Arcesilaus said, from sailing through the leg that has been severed, putrefied, thrown into the sea and dissolved, but the 1,200 triremes of Xerxes along with the 300 of the Greeks from having a battle within the leg?" (Trans. L&S)

type of blending and the one that causes Alexander such pain is that of total blending whereby two substances exist coextended retaining their individual qualities with the ability to be separated out again – i.e. two bodies existing in the same place at the same time¹⁹³. Chrysippus was said to have used the analogy of a drop of wine being extended throughout the whole sea in order to illustrate the idea of total blending:

...certain bodies when helped by one another are in this way united together in their entirety so that being preserved along with their own qualities they have a complete mutual co-extension through one another, even if some of them are rather small in bulk and in themselves unable both to be spread to such an extent and to preserve their own qualities; for in this way also the cup of wine is mixed with a large amount of water and helped by it to such a great extension¹⁹⁴. (Trans. Todd)

This example is quoted by other writers¹⁹⁵ so its authenticity as Stoic cannot really be doubted. What is in doubt however is the purpose of such an illustration. Evidently some in the ancient world, including Alexander, took this example quite literally; as evidence for the Stoic belief that a drop of wine could in fact disperse itself throughout the entire ocean while retaining its own integrity¹⁹⁶. However such an example should not be taken in this way, it is, in the words of Todd, an illustration from which the interaction of *pneuma* and matter can be: “analogically derived¹⁹⁷.”

Alexander’s objections to the theory that two bodies can be in the same place do not simply rely on common conceptions but also display an understanding of the intricacies of Stoic physics. Given this it is difficult to see why he would argue against the proposition that two bodies can be in the same place at the same time if it was in fact not the case that the Stoics held it. One reasonable explanation for why Alexander is under the impression that the Stoics taught that the bodies referred to

¹⁹³ The particularly abhorrent part of this is that the wine remains *actually* wine while dispersed. Aristotle allows for something to be mixed through another thing and then separated out again, but in this case the first thing exists as itself only *potentially* during the mixture and becomes actual again only once separated out again.

¹⁹⁴ 217.26-32 of *On Mixture* (=L&S 48C4-5, part = SVF 2.480, part).

¹⁹⁵ Diogenes Laertius 7.151 (=L&S 48A = SVF 2.479), Plutarch *On Common Conception* 1078E (=L&S 48B = SVF 2.480, part).

¹⁹⁶ Stobaeus 1.155,5-11 (=L&S 48D = SVF 2.471, part).

¹⁹⁷ Todd 1976, p. 70. A view that Sorabji, 1988, evidently does not accept since at p. 81 he states that: “He [Chrysippus] thought the drop of wine would survive, however thinly spread.”

are in the world, and not simply the principles of the world, is that at the time he was writing so much confusion had crept into the school itself, perhaps through a lack of interest in physics, that it had become the accepted view. Another is that Alexander is reliant on secondary texts, such as those from Galen and Plutarch, which are obviously polemical and attempt to undermine the Stoic position by any means possible¹⁹⁸, and that Alexander is simply following this pattern. A final option is that just as with the *Mantissa* section discussed above Alexander is simply engaging in the exploration of arguments for arguments' sake.

If we look now to Alexander's objections we will see that he says nothing that Chrysippus would not accept; which leads to two possible conclusions:

1) That the position that two bodies can be in the same place at the same time is a genuine early Stoic view and the objections are a perceptive indictment of poor quality philosophy from Chrysippus;

or

2) Chrysippus would accept the premises that Alexander's arguments rely on showing that the conclusion that two bodies cannot be in the same place at the same time is as true in a general sense for the Stoics as it is for everyone else.

The first option seems unlikely since Chrysippus is fêted as one of the greatest logicians in the ancient world¹⁹⁹. If the second of these is true it is still the case that the theory of total blending will apply to something and the something that it will apply to will still have to be a body. The only real possibility is that the theory would apply only to the active and passive principles and that there is no absurdity in their being blended "through and through" for an ingenious reason.

The first objection we come across is at 218.15-24 where we are told of the counter-intuitive nature of Stoic blending due to the fact that if a body is a three-dimensional solid it is presumably "full" and as a result will have no room to receive another body

¹⁹⁸ A strong possibility since the equivocation of body would be the sort of trick that could be expected from polemical writers.

¹⁹⁹ DL 7.180 – "so renowned was he (Chrysippus) for dialectic that most people thought, if the gods took to dialectic they would adopt no other system than that of Chrysippus."

into it. This is indeed a very intuitive thought on Alexander's part since that seems to be a differentiating quality of place and body. He goes on to ask how this could be made sense of even going so far as to posit void holes in body into which other bodies could fit²⁰⁰. This is plainly irrelevant for the Stoics since they do not allow void in body and besides that would constitute juxtaposition rather than blending anyway²⁰¹. He next goes on to point out that the Stoics absurdly say that blending need not admit of the compound taking up a larger space post mixture than it did pre-mixture. But we see in every mixture that the volume of the resulting compound is greater than before. At the same point he argues that one body will be the place of the second body but this is absurd since the first body occupies a place already²⁰². He objects also, at 220.23-29, that in blending the two bodies will retain their own distinctive qualities, as this is impossible in an Aristotelian blending where the ingredients only retain their individual natures potentially and not actually²⁰³. But by far the most ingenious and potentially most troubling objection for the Stoics if they did want total blending to apply to things in the world comes at 221.18-19 where Alexander rightly states that:

A unified body must be held together by one State (to use their term - i.e. *hexis*) so that in this respect also the bodies that have been blended would be inseparable from one another. (Trans. Todd)

This is indeed true since every body is a compound of the unifying substance *pneuma* and the material-giving substance *apoiou ousia*.

How do Alexander's objections stand up to scrutiny? If, as he asserts it applies to bodies in the world then it would seem that he is absolutely correct and the doctrine of total blending is reduced to absolute absurdity. Todd argued that it did not apply to the general contents of the world but rather only to *pneuma* and the material principle. However he failed to mark the point that *pneuma* is not to be considered a

²⁰⁰ An option for the Epicureans and other atomists as Aristotle noted.

²⁰¹ Lending credence to the possibility that Alexander is indeed discussing arguments just to look at the arguments themselves and not to demolish the Stoic position *per se*.

²⁰² 219.9-22, for this and the preceding point.

²⁰³ 231-10.12.

compound of fire and air²⁰⁴. As a result he is forced, like so many others, to resign total blending to a position of failure²⁰⁵. Alexander tells us that *pneuma*, for the Stoics, partakes in blending in both possible ways. 223.6-17 states that *pneuma* does indeed partake of blending as the object that is blended with passive substances. But 224.14-17 tells us that *pneuma* is composed of fire and air and so not a simple body. It would in fact become a thing in the world that would rely on *tonos* to exist – essentially the position that was discussed in relation to Sorabji above. That would to all intents and purposes presuppose the truth of *krasis* and its application before the existence of *pneuma* thus rendering the supposed Stoic position so clearly absurd that it is virtually impossible to credit that anyone would consider teaching it.

Yet the clue to answering all these objections is given by Alexander himself in the first problem he sees. At 218.15-24 he said that presumably a body is already “full”. Indeed we can understand the concept of density and its variations but for all that just because one body is less dense than another, say wood compared to lead, it does not follow that one is less “full” than another. But what is distinctive about both wood and lead, as opposed to the general term “body”, is that they are both particular; they are both, to use the Stoic term, “peculiarly qualified”. Peculiar qualification comes about owing to the interaction of *pneuma* on matter. It makes a body specific. It is why that body is that body and not another body.

Alexander’s final point is based on the understanding that for the Stoics bodies each have their own *hexis*, given by the presence of *pneuma*. It follows that if a total blending were to occur then either these *hexeis* would be overlapping or else the

²⁰⁴ Todd 1976 p.36. However Todd 1978 p.149 marks out *pneuma* as another term for *aether* and not as a compound of fire and air. However earlier in the paper he had argued that god and *apoiós ousia* were to be seen as incorporeal aspects of a more primitive body.

²⁰⁵ Gould 1970 too fails to take *pneuma* as a single entity while still arguing that total blending occurs only in relation to primordial substance and *pneuma*. Yet his interpretation is rendered untenable since he still sees *pneuma* as a compound of fire and air. Cf. p. 107, 109 for total blending applying only to the pre-cosmic state, and p. 112 for his assertion that *pneuma* is a compound of fire and air. Long 1974, pg. 160. Nolan 2006 tries to get around the problem of two bodies being in the same place by appealing to the modern notion of “gunk”. Using his understanding of “gunk” which posits “no minimal parts” he attempts to show that with the theory of infinite divisibility two bodies will be in the same place just in case for any part of space you pick, no matter how small, you will find both constituents, so Alexander’s objections carry no weight. While an ingenious idea and ultimately successful I do not think it finds its proper application in Stoic *krasis* since Nolan attempts to use the theory to explain how two peculiarly qualified bodies can be in the same place at the same time. The evidence that the Stoics would have accepted this position is dubious in its authenticity. The idea of reduction to no-minimal points will be seen to be the main connection between the Stoic theory of *apoiós ousia* and the Old Academy in section 3.4 below. The Stoics will be seen to have had this notion of convergence on the infinite and it is this that indeed renders the notion of total blending sensible, iff it is limited to the two principles.

hexeis would merge and thus it would not be a case of total blending but rather of fusion. Alexander's second and third objections - that one body will act as place for the second and that it is impossible for two totally blended bodies to retain their own qualities - can be answered along the following lines: Firstly both these objections simply rely on the notion that total blending is absurd, which is yet to be proven. It is indeed counter-intuitive but that in itself is not enough to simply dismiss any theory. Secondly the first body through which the second is extended will not function as place for the second since both are said to occupy the same place - the criticism makes sense if one body is the place of the second since then the objector would have to posit two different places, *viz.* the place which the first body occupies and another in the first body which the second occupies. However the Stoics can identify either the body that pervades, or the one that is pervaded as place for the other. It is hardly intuitive or an ordinary way of thinking but does it really make sense to suppose that something that lacks particularity, as *apoiós ousia* does, can have a place *before* it is peculiarly qualified by the active principle? I think the Stoics would say that matter without peculiar qualification has no place, but this is a moot point as matter does not exist unqualified, and nothing exists without being in a place. As it would turn out then, it would be necessary for two bodies to be in the same place if any body is to exist at all. Thirdly Alexander's assertion that two blended bodies cannot retain their separate qualities is true for him given his Aristotelian perspective but is clearly false for the Stoics given the fact that the Stoics are Stoics and not Aristotelians.

Given the truth of all these and the largely suppositional evidence from polemical sources it seems reasonable to suppose that Alexander is arguing against a position that was never actually held by any early Stoic. There is only one case of Chrysippus being ascribed by name the position that *pneuma* is a compound of fire and air and this can be dismissed as a misunderstanding of the properties of the breath that he believed constituted the soul of both animals and the universe. Clearly Alexander is in some sense arguing against a position that the Stoics held. This position is that two bodies can be in the same place at the same time. However his objections to the Stoics rest on two assumptions that are erroneous. Firstly he states the position as being that *any* two (or more) bodies can be in the same place at the same time. Secondly two of the bodies that this is true of are fire and air and it is true of them in the case of the compounded active principle: *pneuma*. The second assumption of

Alexander's is a mistake for reasons elaborated on above. The first is the result of taking polemical writings too seriously and misinterpreting the onus that is to be placed on examples that the Stoics gave of the sort of thing they meant by total blending. Given the success of Alexander's *reductio ad absurdum* arguments it is unthinkable that a great logician like Chrysippus would have been ignorant of these conclusions. Since Alexander's premises are largely correct and the only reasonable conclusion is that it is indeed absurd for any two bodies to be in the same place at the same time I can only conclude that for Chrysippus it is not true that *any* two bodies can be in the same place at the same time.

Let us look at the following claims made about total blending:

- Total blending can occur between bodies that exist in the world such as wine and water, fire and iron etc. In short total blending can occur in peculiarly qualified bodies.
- *Pneuma* is a total blending of fire and air, which are themselves peculiarly qualified bodies.
- Total blending occurs between the active and passive principles.
- The active and passive principles are not peculiarly qualified bodies.

Alexander's *reductio* works because the first claim in the list above has been almost universally accepted when it should not be. The arguments Alexander employs all criticise the notion that two peculiarly qualified bodies can be in the same place at the same time. However following Todd I suggest that this is not the application of total blending that Chrysippus envisaged. Any imagery, such as the drop of wine in the sea, is simply for explanatory purposes. The only application total blending can have if we reject its application to peculiarly qualified bodies is to unqualified bodies. The only possible candidates for unqualified bodies are the two principles²⁰⁶.

Long and Sedley also argue that the Stoic position is best understood in terms of interaction between the two principles:

In order to do justice to the Stoic intuitions, we should regard the two things that occupy the same place not as two determinate and

²⁰⁶ Although it is not clear if the active principle, being the principle of qualification, is itself unqualified. However it is enough if at least one of the principles is unqualified and the material principle most clearly is.

independently existing bodies, but as the two bodily functions (breath and matter) which jointly constitute every determinate and independently existing body²⁰⁷.

However the position that they take is still biased by the conclusion that *pneuma* is a compound of fire and air. But here they understand the limit of total blending to be between two things that are not determinate bodies²⁰⁸ but taking the perspective of Sorabji met above that the principles are aspects of a single more fundamental body. The description of breath and matter as “bodily functions” is quite vague and suggests that Long and Sedley understand the principles as derivative of the “fundamental body” as Lapidge and Sorabji do. However even if they are “functions” the discussion from the *Mantissa* makes it clear that they would still be bodies since “function” suggests quality. It is unclear what Long and Sedley hope this terminology will resolve. It is this fact of determination or particularity that is correctly identified as the factor that prevents total blending as occurring between two bodies in the world.

This position can be clarified by appealing to an argument used by Chrysippus to the effect that two peculiarly qualified individuals cannot occupy the same substance at the same time. Given the verbatim nature of this passage it seems very strange that anyone would, after seeing it, still think that Chrysippus means for us to take the analogy of wine blending with water as anything more serious than an illustration. The argument follows the parallel lives of Theon and Dion who are supposed to exist in the same substance:

Having first established that it is impossible for two peculiarly qualified individuals to occupy the same substance jointly, he says: “For the sake of argument, let one individual be thought of as whole limbed, the other as minus one foot. Let the whole limbed one be called Dion, the defective one Theon. Then let one of Dion’s feet be amputated.” The question then arises which one of them has perished, and his claim is that Theon is the stronger

²⁰⁷ L&S p. 294.

²⁰⁸ They in fact seem to be leaning towards the position of Lapidge and Sorabji, that “breath and matter” are aspects of a more fundamental body. However on my interpretation and understanding that it is only the particularity of bodies that prevents them partaking in total blending the relegation of total blending to being between aspects of a body is unnecessary.

candidate... "Necessarily", says Chrysippus. "For Dion, the one whose foot has been cut off, has collapsed into the defective substance of Theon. And two peculiarly qualified individuals cannot occupy the same substrate. Therefore it is necessary that Dion remains while Theon has perished."²⁰⁹ (Trans. L&S)

The passage introduces Theon and Dion as being two separate people existing in the same body. One is the whole person, the other the same person but without a foot. This absurdity was clearly not accepted by Chrysippus and indeed is completely contrary to common sense anyway, and is being used by Chrysippus to respond to his critics. This passage argues that two peculiarly qualified individuals cannot occupy the same substrate, though it could be argued that this does not demonstrate that two peculiarly qualified individuals cannot occupy the same place at the same time; i.e. partake of total blending in a way that I have been arguing against. This could be supposed on the basis that what is being discussed in the Theon/Dion example is a single matter being permeated by two *hexeis* and not two peculiarly qualified instances of matter being in the same place at the same time. But if we look at the implication of the passage closely it will show that total blending cannot occur in the world. It shows this because if total blending applies to the objects in the world, as Alexander would have us believe, then this would require two *hexeis* to exist in the same place at the same time and the absurdity of the situation of Theon and Dion shows this is not something Chrysippus accepted. Every body in the world is constituted of a mixture of the active and passive principles. It follows then that if two worldly bodies are to be mixed in a total blending that two contrasting parts of the active principle will have to be in the same place at the same time. That is the active principle will have to be disposed in different ways in the same place. Since Chrysippus rejects this notion in regard to the above example it follows that bodies made up of the active and passive principles cannot be candidates for total blending.

²⁰⁹ Philo *On the Indestructibility of the World* 48 (=L&S 28P2-6 = SVF 2.397, part). Long and Sedley, in their commentary on the passage, argue that the purpose of the example, given its context from a book *On the Growing [argument]*, is to refute the Academics by showing that even if we accept the premise that Theon and Dion are distinct, which Chrysippus wouldn't, then their argument is absurd since change is shown to be necessary for the continuing existence of the individual, since it is Dion who survives in virtue of his foot being chopped off. However, the fact that Chrysippus would reject the idea that Theon and Dion start off as two individuals only serves to reinforce the point I wish to make: that two *hexeis* cannot be in the same matter, hence two peculiarly qualified bodies cannot occupy the same place at the same time as commentators like Alexander would have us believe the early Stoics taught.

But since Chrysippus undoubtedly believed it does occur it remains that it can only occur between the principles as these are the only bodies left. We have here a case of the type that Alexander raised as a criticism of total blending where he said at 221.18-19:

A unified body must be held together by one State (to use their term - i.e. *hexis*) so that in this respect also the bodies that have been blended would be inseparable from one another. (Trans. Todd)

In other words there has, if there are to be two peculiarly qualified bodies in the same place at the same time, to be a unifying *hexis* since two cannot overlap. In the case of Theon and Dion they are to begin with different but are so due to different *hexeis* but when the matter they both cohere in is made co-extensive it is no longer possible for the two *hexeis* to exist in the same place at the same time. One *hexis* is overwhelmed, expelled or otherwise superseded by the other, in this case by the one with the longer history in the matter. Chrysippus also says that: "two peculiarly qualified individuals cannot occupy the same substrate", and we saw above in 1.2.1 that the Stoics call their prime matter "unqualified substance" *because* it is the ultimate substrate. It is not enough to argue that substrate refers to proximate matter, already qualified bodies, since it is clear that Chrysippus is really arguing that two lots of *pneuma*, *hexis*, god or whichever name is chosen, cannot occupy the same part of *apoiós ousia*. Fire and air are both constituted by a *hexis* and matter each. Like Theon and Dion fire and air cannot engage in total blending, so *pneuma* is not a compound. If it is not a compound then it can only be god. Given that this is the case he cannot ever mean to argue that total blending can occur in the world where every body is automatically a qualified individual since *apoiós ousia* never exists without god.

The last section has shown that the application of total blending in Stoicism is really only reasonable when viewed in relation to the two *archai*. This is its only purpose. After all this theory has absolutely no use in actual physics and is manifestly false and unnecessary in the sensible world of everyday experience. This raises an interesting question: if it is unnecessary in the sensible world of everyday experience, why is it necessary in relation to the two principles which act together in

order to create the world? We met the answer above at the beginning of chapter one in a quote from Cicero:

Zeno...[thought] that it was totally impossible that something incorporeal...should be the agent of anything, and that only a body was capable of acting or being acted upon²¹⁰. (Trans. L&S)

The result of this is that since both *apoiōs ousia* and *pneuma* have to be bodies in order to act, and since *pneuma* is god and god gets his name from his pervading²¹¹ nature whence *pneuma* has to be "inside" the *apoiōs ousia*, then the Stoics have to have two bodies in the same place at the same time. For the world to be it is necessary for god to be everywhere that matter is, if this were not the case then there would exist somewhere matter that is bare and god which is inactive. These two situations are impossible, so total blending becomes the lesser of two seeming absurdities.

The *apoiōs ousia* of Zeno, Cleanthes and Chrysippus clearly fulfils the criteria set out at the end of 1.1.1, that it is qualityless, accounts for the corporeal nature of physical bodies, underlies all change and is a principle hence relies on nothing more primitive for its existence. The early Stoics can be credited with making two important points about matter which build upon these basic criteria. Firstly they clarified its nature as an *ekmageion* a pure "out of which" responsible for the three-dimensional aspect of sensible reality. While Aristotle, as will be seen, moved in this direction he stopped short of developing a codified understanding of Prime Matter as the "out of which" *par excellence*²¹². They developed an understanding of it as a principle of equal importance with the activating or vitalising principle of the universe assigning to matter a place of importance *qua* matter which it had not had before. Secondly, and perhaps more importantly, under the Stoics matter was developed from the purely conceptual and incorporeal principle of corporeality that it had been in the Old Academy and Plato and, while retaining part of this nature, became instead the corporeal principle of immanent corporeality in the world. The Stoics are building on the work of the Old Academy by continuing the tradition of the reduction

²¹⁰ Cicero *Academica* 1.39 (=L&S 45A, part, = *SVF* 1.90, part).

²¹¹ Cf. Diogenes Laertius 7.147 (=L&S 54A part = *SVF* 1.1021 part): "For they call him Zeus [*Dia*] as the cause [*di'hon*] of all things; Zēn in so far as he is responsible for, or pervades, life [*zēn*]."

²¹² Aristotle's lack of clarity on the issue of prime matter is testified to by the continuing contemporary debate on the correct interpretation of Aristotle.

of principles. They appeal to only a single level of reality rather than the complicated hierarchy of reality that seems to have been what Plato was teaching, at least towards the end of his career if not before. They did not need an incorporeal matter for they had little use for incorporeals in the first place: those that they do accept they see as subsisting in relation to the material world. Matter *qua apoios ousia* remains a conceptual object. It is not possible to find it, it does not exist as unqualified but is eternally conjoined to the qualifying principle – god. Next we will see what the background from Plato in his *Timaeus* Aristotle was that enabled such a doctrine of substance to be developed, before moving onto the Old Academy and the *Parmenides*, *Philebus* and Unwritten Doctrines of Plato that really hold the key to the development of *apoios ousia*.

Chapter 2.

2.1 The *Timaeus*:

The *Timaeus* stands alone in the Platonic corpus. It tackles a subject that is generally rejected by Plato as unknowable²¹³ – the nature of the sensible world. In the *Phaedo* 97b+ Socrates describes hearing the teachings of Anaxagoras: that everything is ordered by Mind and that it causes all things. This was greatly agreeable to the young Socrates, and we may suppose to the young Plato, but on closer inspection of Anaxagoras' work he found it unsatisfying since in reality none of the explanations offered by Anaxagoras employed Mind in a meaningful way²¹⁴. It is this issue that Plato is addressing in the *Timaeus*. He attempts to demonstrate the force of Mind and teleology, moving away from mechanistic explanations of the universe. Everything is the way it is by necessity because it is ordered by Mind and such a force would order things in the best way possible: i.e. on the schema of the forms. Thus the *Timaeus* stands as a unique work in the Platonic corpus with a theme of the natural world and its relation to forms of objects, rather than ethical dilemmas. It employs the same terminology and ideas that for us characterise Platonism, yet gives a new role for the forms and the nature of divine justice. This work is the linchpin of Platonism, bringing all previous dialogues to their head by going back to first principles²¹⁵.

The *Timaeus'* subject of the physical makes it the most obvious place to look for an account of the material principle in Plato. Traditionally, in the ancient world, the Receptacle of all becoming was identified as prime matter in Plato. It was taken to be the "out-of-which" for all objects in the world. A second option is the elements and the triangles that are responsible for them. That somehow they fulfil the role that has been established in this thesis by *apoiós ousia*. This part of the chapter will look at the *Timaeus* and see what account it actually gives of a material principle and how

²¹³ In his response to Krämer Vlastos (1981) goes to great pains to explain that the account in the *Timaeus* is only a "likely account", not because it is written down as Krämer suggest, but because the sensible world is so devoid of being and stability that whatever is said of it can only ever be likely and not true. See Gregory (2007, pp. 147-150) for a comprehensive discussion of the arguments for and against the literal interpretation of the *Timaeus*.

²¹⁴ *Phaedo* 97b-c. "This wonderful hope was dashed as I went on reading and saw that the man made no use of Mind, nor gave it any responsibility for the management of things, but mentioned as causes air and ether and many other strange things."

²¹⁵ Cf. Archer-Hind pg. 2.

this may have been understood by the Stoics. To do this the opposite principle to prime matter – god - will have to be discussed as it was in chapter one.

2.1.1 The Elements:

Since the first sort of matter that is discussed in the *Timaeus* is the elements I will follow this structure. Following tradition Plato introduces the four elements as the constituent building blocks of the world. The elements are introduced at 31c as being the things that are responsible for the world's being visible and tangible: "without fire nothing could ever become visible, nor tangible without some solidity, nor solid without earth."²¹⁶ The elements are chosen because of the properties that they will bring to that which is created out of them. It is interesting to note that Plato here does not say that fire brings heat to the world or earth dryness but rather visibility and solidity respectively. The second pair of elements, air and water, are introduced not because they are responsible for any particular qualities in the world but rather in order to bind the first pair of elements. Two things, we are told, cannot be joined together without a third to bind them. The fairest bond is that of proportion, i.e. when the middle term is to the first as it is to the last, and as the last term is to the middle and the middle to the first, and so all the terms become interchangeable. If the body of the all were to be a plane figure then this one middle term would suffice, but it is to be three-dimensional²¹⁷. As a result a second term is required. Despite the fact that earth is responsible for the solidity of the world it is the presence of four elements that is responsible for the world's being three-dimensional. This three-dimensional nature is not arbitrary but necessary. 32b tells us that the world was to be "solid of shape" and that since this is what the demiurge wanted, having no share of envy, there had to be four elements. These four stand in a relation: air is to water as fire is to air, and water is to earth as air to water. From these the heavens were created.

So far the situation has a fair number of similarities to what would later emerge as the Stoic position. The elements are the proximate matter of the world, and the objects in the world, and they stand in a well regulated proportion to each other according to the wisdom of god. The implication, later spelled out, of the

²¹⁶ *Tim.* 31b. (Trans. Bury)

²¹⁷ The sensible world is to be three dimensional, because as chapter three will show, it is an image of the geometrical level which involves solid figures. If the solid did not exist in the geometrical level then presumably there would be no necessity for the sensible world to be three dimensional. But the geometrical level has to have the solid because it is in turn an image of the mathematical level and in particular an image of the *tetraktys*. The *tetraktys* is the very principle which causes the instantiation of the geometrical principles: the point, line, plane and solid. The sensible world's three dimensionality is thus a necessity owing to mathematical necessity and the simple existence of the One.

interchangeability of the terms is that they are transmutable, just as in Stoicism (and Aristotelianism). However, when Plato goes on to explain the nature of the elements, what it is that their nature consists of, he does so in an unexpected fashion. As for the Stoics so for Plato the Four elements are bodies. But while in Stoicism the fact that they were bodies could be explained by the fact that they were made from two bodies this is not the case for Plato. Rather, in what appears to be (though in fact probably is not) a *volte face* Plato appeals to the triangles that make up the elements. The elements are bodies because the triangles clump together to form regular solids: the pyramid, icosahedron, octahedron and cube. The *volte face* that I refer to is this: At 32b Plato explains that the world is three-dimensional because it is made of four elements. Solidity is a quality given to it by the presence of the element earth. If this is the case why is it now that the elements rely on triangles for the fact that they have a three-dimensional existence? The most likely solution is that Plato is not giving us an exact account of the nature of the material world because it is simply not the right sort of thing to give a true account of. Therefore we should not be surprised if there are inconsistencies in an account of an inconsistent world.

This option has in its favour simplicity and textual support. Plato generally seems fairly sceptical of the possibility of gaining any actual knowledge or truth from the sensible world²¹⁸. Indeed one of the first things the character Timaeus tells us is that he is going to offer us a *logos* – an account²¹⁹. It is not fact, but nor is it unambiguously false. It is likely that the whole account is proposed as a perfectly plausible, though not fool-proof explanation. If there is ambiguity and inaccuracy or even contradiction we should not be surprised. Plato is well known for keeping knowledge in the realm of forms, and far away from the sensible world. It follows that an explanation of the world is not going to be devoid of problems nor is it going to lead to knowledge and fact. The Stoics, with their ontology and epistemology do not have this luxury. Owing to the fact that it is the subject matter that will be responsible for any problems that arise, it may be unfair to characterise Plato's appeal to triangles as being responsible for the elements' solidity as a *volte face*.

²¹⁸ Crombie 1966, pg. 153, argued that Plato thought the sensible world entirely unsuitable for study and so any analysis of it was a waste of time.

²¹⁹ *Tim.* 29c says that owing to the nature of the universe, and ourselves, we should not be surprised if the account is not true but likely. This passage also refers to the account as a "myth" further reinforcing its speculative nature.

The geometrical nature of the elements is not actually discussed until just about midway of the dialogue and after the extensive discussion of the creation of the world-soul and the introduction of the Receptacle. In the first part of chapter one primary matter was found to be that which underlay proximate matter but which did not rely on any further matter or substance below it. In this case the elementary triangles are what underlie the proximate matter of the world which we saw Plato accept as the four elements. It seems reasonable to suppose that the triangles would, in this case, fulfil the definition of primary matter that we saw *apoiios ousia* do. But the similarities between *apoiios ousia*, a bare three dimensional extension that is body, and triangles seem fairly slim²²⁰. When the triangles are introduced there are said to be two types: the equilateral and the isosceles²²¹. These two constitute each geometrical figure which in turn constitutes each element. So that Earth, being the most stable element, is represented by a cubic atomic figure and that cubic atom is in turn constituted by the isosceles triangles. Fire is constituted by a pyramid which is the most dynamic geometrical figure, the pyramid is in turn constituted of half-equilateral triangles²²². Water and Air are represented by the icosahedron and octahedron respectively. Both of these are also constituted by the equilateral triangles. It is this sharing of the same elemental triangle that allows these three elements to transmute into one another. Earth, though, is left out of the cycle of elements. It is only an illusion which leads us to think that it is in the same cycle, which is not to say that it does not interact with the other elements. It does indeed do so, but when its atoms are overwhelmed and broken down to the constituent triangles they can only form Earth again, but will not do so straight away since the atoms of whichever element overwhelmed Earth will prevent this occurring immediately.

Primary matter as found in Stoicism is a continuum. This allowed it to be the same throughout itself and so entirely malleable. Atomic triangles and the subsequent

²²⁰ Alexander *Quaestio* 2.13 argues that in every change there is something underlying that change that the change is predicated of. In this context he argues that the triangles are the ultimate matter in the *Timaeus* since it is to these that all bodies can be reduced. This position is clearly based on one that denies a material role for the Receptacle.

²²¹ At 53e *Timaeus* states that: "For if we succeed herein we shall grasp the truth concerning the generation of earth and fire and the mean proportionals." (Trans. Bury) We should then be given an explanation as to why the mean proportionals used earlier in the dialogue during the creation of the world-soul are in fact imperfect. They fail to resolve back to a harmony, and the elements of fire and earth fail to resolve back into one another. Is this perhaps yet another illustration of the imperfection of the physical universe? The elements fail in their perfect transmutation because the world is but an image of an eternal paradigm and so incapable of admitting a perfect system.

²²² Fire is composed of 24 half-equilateral triangles arranged to form a tetrahedron. 6 half-equilateral triangles form each of the 4 equilateral faces. Cf. *Tim.* 54e-56c.

shapes they make do not have this flexibility. The element earth is removed from the transmutation process as its triangles are of a different sort from the others. Prime matter should be a single thing, not two. There is also the added problem of whether or not this system of triangles would result in a continuum or not. It seems more likely that there will be void inside the geometrical bodies and this is very far removed from anything the Stoics would accept. Not only do the elements and elemental triangles bring the absurdity of multiple prime matters and the potential for void but it seems that Plato is not altogether dedicated to minimising the characteristics that they possess. We are told that in the pre-cosmic chaos there is motion²²³. But in other dialogues²²⁴ Plato makes it clear that motion is caused by the soul. It seems that if the *Timaeus* is understood literally then before the demiurge goes to the effort of creating the cosmos there is something external and somehow disposed existing in its own independent way. This is quite clearly not the case in the Stoic universe. While for the Stoics, if such a thing can be conceived, "before" god acts on matter everything is still since matter has no properties or activating energy integral to it²²⁵. Yet for Plato it has to be supposed that there is something, that again cannot be primary matter, that has an internal motive power that is irrational. What god appears to do is take an existing power of motion and make it rational and ordered. If we follow the letter of the text the first thing that the demiurge creates out of this ambiguous pre-existing stuff is the world-soul²²⁶.

In non-literal readings of the *Timaeus* the world-soul is taken to be identical with god. This is an interesting parallel with Stoicism in light of the account of the creation of the world-soul: where it is taken to be stretched out throughout the cosmos. The implication is that there is no part of the cosmos where there is no god. The world is even described as the body of the world in the *Timaeus*²²⁷ in a way that seems prescient of the Stoic position. The text states that the materials out of which the world-soul are created are not the sort of things normally associated with a material nor either account of the elements that we have met. Instead they are:

²²³ *Tim.* 53a and 69c.

²²⁴ E.g. *The Laws* and *Phaedrus*.

²²⁵ Sextus Empiricus *Against the Professors* 9.75-6 (=L&S 44C1-2 = *SVF* 2.311, part).

²²⁶ 34b-c: "Now as regards the Soul, although we are essaying to describe it after the body, God did not likewise plan it to be younger than the body; for when uniting them, He would not have permitted the elder to be ruled by the younger." (Trans. Bury)

²²⁷ E.g. *Tim.* 32c, 34b-c.

In between the *Being* that is indivisible and always changeless, and the one that is divisible and comes to be in the corporeal realm, he mixed a third, intermediate form of being derived from the other two. Similarly, he made a mixture of the *Same*, and then one of the *Different*, in between their indivisible and their corporeal, divisible counterparts. And he took the three mixtures and mixed them together to make a uniform mixture, forcing the *Different*, which was hard to mix, into the conformity with the *Same*. Now when he had mixed these two together with *Being*, and from the three had made a single mixture, he redivided the whole mixture into as many parts as his task required, each part remaining a mixture of the *Same*, the *Different* and of *Being*²²⁸.
(Trans. Zeyl.)

It appears as though the world-soul is being created out of abstracted ways of being rather than out of any matter as would be normally understood. The Stoics' active principle is quite clearly bodily and co-extensive with the material principle. Furthermore for the Stoic god's intellect can be understood as the forms, if forms have to be found in Stoicism, and his intellect is bodily and expressed in the objects of the world²²⁹. What Plato seems to be implying is that the world-soul has some sort of relation to the transient sensible world and to the formal world and so will be the connecting link between the two²³⁰. Since the relationship of the active principle to the passive principle in Stoicism proved illuminating in the explanation of the passive principle it is time to turn to the interpretation of the active principle in the *Timaeus*: the world-soul.

The account offered at *Timaeus* 35a-b of the creation of the world-soul is considered by Cornford²³¹, quite accurately in my opinion, to be the hardest passage of the

²²⁸ That is, there are six ingredients: the indivisible and divisible Being, indivisible and divisible Sameness and indivisible and divisible Difference.

²²⁹ Rist (1969, pg. 204) argues that the purpose of god is to give shape and form to the world. At pg. 206 he goes on to argue that for Posidonius the world-soul is the idea of the world and is the shape of the world as well as being both geometrical and physical number – it exists as the number comprising harmony. This last point will be seen to be as a result of the Old Academic legacy to Stoicism. At pg. 207 Rist continues and states that it is likely that Posidonius was the first Stoic to say that Platonic forms are not merely human concepts (and so by extension god's) but to explicitly state that the forms are god's concepts directly.

²³⁰ Cf. *Tim.* 37a-b where Plato explains that the world soul touches all things and announces what they are similar or dissimilar to.

²³¹ Cornford 1956, pg. 59

Timaeus. The interpretation of Proclus found support at the beginning of the last century after being largely ignored for a substantial time, much to the detriment of Academic study since it is almost certainly the correct understanding of this passage. The position of Proclus is most clearly explained by G. M. A. Grube in his 1932 paper on the passage of the *Timaeus*, and has since become the dominant interpretation. Grube criticises those interpretations which identify the Same with Being, and Difference with the Being which is "transient and divisible in bodies."²³² Instead, says Grube, the demiurge makes three divisions in order to get the three things which he will blend together in order to create Soul. The three basic ingredients are Existence (*ousia*), Sameness (*tauto*) and Difference (*thateron*). Each of these has two types – the indivisible and the divisible. It is the intermediate between each which the demiurge is at this stage interested in. That is he is interested in the Existence between indivisible Existence and divisible Existence, and so on for Sameness and Difference. There are then three constituents (as indeed Plato makes clear), the third kind of Existence, the third kind of Sameness and the third kind of Difference. These are then blended together. Having to mix all three Plato first mixes the third kind of Sameness with the third kind of Difference, and finally mixes this creation with the third kind of Existence to create the World-Soul. Cornford's²³³ translation of the passage makes this process much clearer and runs as follows:

The things of which he composed soul and the manner of its composition were as follows: (1) Between the indivisible Existence that is ever in the same state and the divisible Existence that becomes in bodies, he compounded a third form of Existence composed of both. (2) Again, in the case of Sameness and Difference, he also on the same principle made a compound intermediate between that kind of them which is indivisible and the kind that is divisible in bodies. (3) Then, taking the three, he blended them all into a unity, forcing the nature of Difference, hard as it was to mingle, into union with Sameness, and mixing them together with Existence.

The nature of these ingredients is not entirely without problem. Xenocrates, Crantor of Soli and Posidonius all read the passage in apparently different ways with different

²³² *Tim.* 35a. (Trans. Bury)

²³³ Cornford 1956, pp 59-60, Cornford helpfully numbers the points of creation.

results. The disagreement between Xenocrates and his pupil Crantor is indicative, according to Taylor²³⁴, of the fact that there was no definite structure of interpretation in the Old Academy and that Plato himself had left the issue unresolved. According to Plutarch²³⁵ Xenocrates interpreted the creation of the soul as being no more than the creation of number since soul was self-moving number for him²³⁶. However for Crantor the main purpose of soul is not as originator of motion but intellection. Following the principle that “like is known by like”, (which Aristotle tells us Plato adhered to²³⁷) when Plato says that the soul is created from Being and Becoming it is because the soul must know both Being and Becoming. This interpretation leads to Posidonius’ position which is interesting for us since he is one of the great Stoics, while also adopting some aspects from “mainstream” Platonism²³⁸. He also, interestingly, seems to take Crantor’s assertion further and has the soul exist as corporeal, which as we saw is the traditional nature of the Stoic god. 1023b of Plutarch’s *On the Creation of the Soul in the Timaeus* gives us the account of Posidonius and his followers. They took “divisible in the case of bodies” and its mixture with intelligibles to make the soul “the form of the omnidimensionally extended²³⁹.” Plutarch’s objections to Posidonius are not strong; he tries to make sense of this Stoic position using Platonic concepts, failing to appreciate that Stoics are not Platonists²⁴⁰. Either way, he is most likely correct in rejecting an interpretation which makes the World-Soul corporeal: but the point to note here is that this is a plausible reading for a Stoic to take on the issue²⁴¹. If we take the account of Grube (and Proclus) then we see the most plausible interpretation of the constituents involved in the creation of the soul. Neither, as Plutarch²⁴² and Taylor²⁴³ point out is Sameness to be identified with Rest or Difference with Motion since in the *Sophist*²⁴⁴ Plato states emphatically that they are different things.

²³⁴ Taylor 1928 pg. 106.

²³⁵ Plutarch *ibid.* 1012D = Fr. 68 Heinze.

²³⁶ See the next chapter for details of Xenocrates’ philosophy and the *Timaeus*.

²³⁷ *De Anima* a.404b16. In the preceding lines he explains how Empedocles held the same principle.

²³⁸ Dillon (1996, pg. 108) sees Posidonius as influential on the Middle Platonists, and responsible for the intertwining of the Stoic and Platonist schools. A Stoic version of Antiochus of Ascalon.

²³⁹ See the account of Speusippus in the next chapter for a parallel interpretation, although with a different result.

²⁴⁰ For instance he objects at 1023C that the soul cannot be a Form since Forms are static and the soul is in motion, and that Forms cannot mix with bodies but the soul does.

²⁴¹ Although arguing from the principle that like is known by like and that the world-soul knows corporeal existence, it is not so absurd to conclude that the world-soul is in some sense corporeal.

²⁴² Plutarch *ibid.* 1013D.

²⁴³ Taylor 1926 pg. 114.

²⁴⁴ *Sophist* 254D4-259B7

Plato then moves on to the particularities of the creation, detailing the method of division and mixture that the demiurge used to create the proportion of the soul. 35b-36c explains the scale of numbers that the demiurge used. I am inclined to view the ultimate failure of the account to resolve into a perfect fraction as a deliberate device for Plato in order to show the inability of the Pythagoreans to explain the world via mathematics. The demiurge splits up his newly made creation in the following division: into a piece, then a piece twice as big, three times as big, four times as big, eight times as big, nine times as big and finally twenty seven times as big. i.e. 1. 2. 3. 4. 8. 9. 27. Split into lines of the even and odd we end up with 2. 4. 8. and 3. 9. 27. with 1 being the common origin of both. A reasonable question to ask would be: why these numbers? The even increase in doubles and the odd in triples, they are the numbers that in the ratios set out below will give us the full harmonic scale. Plutarch also gives us various reasons of esoteric significance but they need not concern us here. The demiurge now has to fill in the intervals between the numbers, he does so using the harmonic and the arithmetic means. The harmonic is achieved by: $(2a \times a)/(a + a)$, and the arithmetic by dividing the sum of the numbers by the number of numbers, e.g. the demiurge fills the numbers 4 and 8 with $5 \frac{1}{3}$ (i.e. 5.3) and 6, so on the even side we end up with the filled ratios: 1. $\frac{4}{3}$. $\frac{3}{2}$. 2. $\frac{8}{3}$. 3. 4. $\frac{16}{3}$. 6. 8 and on the odd: 1. $\frac{3}{2}$. 2. 3. $\frac{9}{2}$. 6. 9. $\frac{27}{2}$. 18. 27. This really amounts to a musical system and is no doubt meant to be indicative of the harmony of the soul as a perfect system perfectly constructed. However between every $\frac{4}{3}$ interval we can fit two lots $\frac{9}{8}$. But this leaves the unresolved ratio of $\frac{256}{243}$, i.e. between 1 and $1 \frac{1}{3}$ (which is a ratio of 4:3), Plato inserts two 9:8 ratios, e.g. 1. $\frac{9}{8}$. $\frac{81}{64}$ (i.e. $9 \times 9/8 \times 8$). $\frac{4}{3}$. The ratio between 1 and $\frac{9}{8}$ is 9:8, the ratio between $\frac{9}{8}$ and $\frac{81}{64}$ is also 9:8, but between $\frac{81}{64}$ and $\frac{4}{3}$ it is $\frac{256}{243}$ ²⁴⁵. This cannot be resolved, i.e. there is no way for the scheme to continue perfectly, as Plato well knew, and so we are left with the apparent failure of mathematics to account for the nature of the soul. This obvious failure to resolve the scheme of harmonic division perfectly rather points to the inability of the Pythagoreans to create the world satisfactorily out of mathematics. It puts in mind the story of Hippiasus being ejected from the Pythagorean school for making it generally known that the square root of two is not a rational fraction thus casting

²⁴⁵ Perhaps more clearly expressed: between 3 and 4, we can insert $\frac{3 \times 1 \times 9}{8} = \frac{27}{8}$, and $\frac{3 \times 1 \times 9 \times 8 \times 9}{8} = \frac{243}{64}$ since both are greater than 3 but less than 4. We could not insert another interval since $\frac{243 \times 64 \times 9}{8} = \frac{2187}{512}$ and this is greater than 4. But the interval $\frac{9}{8}$ did not completely fill the ratio of 3 and 4 since $\frac{243}{64}$ is less than 4. The gap that remains is $\frac{256}{243}$ which is less than a whole tone.

into doubt the beauty of mathematics and its ability to explain the world rationally. Is Plato here just poking fun at the Pythagoreans? Or perhaps the fractured nature of the mathematics of the soul mirrors the nature of the soul as itself a fractured entity? – The nature of the world-soul is as fractured in sympathy with the sensible world. The soul is a conglomeration of things which were stated to be “hard to mix” (Being, the Same and the Different, is this a mathematical instantiation of that difficulty? If we take into account Cornford’s opinion that the “wandering cause” is to be identified with the circle of the different and his opinion that this demonstrates the world-soul to be less than wholly rational this fracture in its nature is curiously understandable²⁴⁶.

According to Cornford Plato’s decision to stop the sequence at 27 is arbitrary²⁴⁷, but according to Plutarch it is not, since the scheme contains seven numbers and also the various ways of adding and multiplying the numbers used by Plato result in new numbers of transcendent Pythagorean importance, e.g. 6. Cornford suggests that if musical harmony were Plato’s only goal then he would be better off staying with just one tetraktys – the even, but in order to allow for magnitudes he needs to have odd numbers, and hence the second tetraktys²⁴⁸. The account of the creation of the soul shows the close connection between the Stoic active principle and the world-soul of the *Timaeus*. It also shows very strongly the Platonic emphasis on mathematical explanations and the core role that it plays in metaphysical explanations. The importance of mathematics for the material principle will be further demonstrated in chapter three as will its relationship to Stoic mathematics.

The creation of the soul was discussed to explain both what it is in the pre-cosmos that exists and to show the importance of mathematics for my thesis. One of the ingredients of the world-soul is the being that is the same and this can be understood as being the stuff of the forms. The being that is different is the stuff of the sensible world, however it seems unlikely that this should be understood as anything akin to a corporeal substrate. The stuff of the elemental triangles, which

²⁴⁶ 1956, pg. 76. Cornford also suggests that this leaves open the possibility that the world-soul is not completely rational. An idea central to Plutarch’s *On the Creation of the Soul in the Timaeus* is that the World-Soul was “evil”, in that it was disordered before the imposition of order on it by the demiurge, however not even the imposed order is perfect. *Tim* 36b is where Plato finishes the account of the intervals and ends with the unresolved 256:243

²⁴⁷ Cornford 1956 pg. 67: “this compass is determined solely by the decision to terminate the series with 27, the cube of 3.”

²⁴⁸ *op cit.* pp. 68-69.

existed in a disordered way prior to god's ordering, should surely be the same as the stuff which constitutes the being that is different and is in the world soul. Plato does not tell us what the triangles are actually made from. In fact it appears to be a brute triangular atomism. The only thing that suggests that there may in fact be something beyond them and more fundamental is that at 81d we are told that the "root of the triangles grows slack". This results in weakened triangles that are unable to cut and divide other triangles. Instead they end up being dissolved by other triangles and the entity that the old ones make up withers and dies. Geometrical figures are made up of planes, planes of lines and lines of points. If we follow the theory of triangular atomism to its mathematical conclusion we end up with points being the "stuff" out of which the triangles are ultimately constituted. Points do not rely on anything *per se*. This conclusion also explains how the world-soul can be said to know both the forms and sensible world. If the forms are essentially mathematical in nature, as will be shown in the next chapter, and the world is made up of geometrical points then the connection between them becomes clearer. The world is an image of the forms. The forms are essentially noetic numbers, the elemental triangles and solids then become the sensible representation of perfect immaterial numbers. It seems that on this interpretation of the *Timaeus* that "point" or all the points, as it were, become the *ekmageion*. The world is made up by god playing a cosmic game of join-the-dots. The upshot is that we end up with a matrix much as was suggested by Cornford²⁴⁹. However he made his matrix up from space and this was based on his interpretation of the Receptacle. It is to the Receptacle that attention will now turn as it is the other choice in the *Timaeus* for a material principle and as yet I have not offered much evidence for my mathematical interpretation, which puts mathematics at the centre of Platonic physics and metaphysics though this will change as other dialogues are brought into the discussion.

²⁴⁹ Cornford 1956, pp. 177-188. He argues that the Receptacle is a separate sort of thing since it is not a Form nor a sensible body but a nature more obscure than just geometrical space, though we cannot be sure how accessible the notion of geometrical space would have been at that time. It could be that Plato spends so much time discussing the Receptacle precisely because the notion of geometrical space was so novel and obscure for him and his contemporaries.

2.1.2 The Receptacle of Becoming:

The Receptacle is brought in after the elements have been introduced but before the elemental triangles. Its place in the physics of the *Timaeus* is not clear as it seems at the same time to replace the original purpose of the elements before being in turn replaced by the elemental triangles. Timaeus brings in the Receptacle as an integral part of existence, a third thing reminiscent of the three constituents of the world-soul:

A third kind we did not at that time distinguish, considering that those two were sufficient; but now the argument seems to compel us to try to reveal by words a Form that is baffling and obscure. What essential property, then, are we to conceive it to possess? This in particular, - that it should be the receptacle, and as it were the nurse, of all Becoming²⁵⁰. (Trans. Bury)

The Receptacle, like the demiurge is something which is difficult to grasp. It is apprehensible only via “bastard reasoning”. It is not a form so is not a fit subject for proper reason, nor is it apprehensible by the senses. Just as the Stoic *apoiōs ousia* was found to be never devoid of qualities so neither is the Receptacle ever found by itself. This makes its nature difficult to grasp.

There is much debate over the nature of the Receptacle. Is it to be understood as matter or space, both or neither²⁵¹? Aristotle seems to have been under the impression that Plato was the first to try to understand what space was but that in doing so he conflated it with matter. However there is no direct textual support for interpreting the Receptacle as matter. That Plato does not call the Receptacle *hylē* is not strong evidence as it is unknown whether or not the term was in use before Aristotle in this context. This rather weak negative evidence is supported, though, by the stronger direct language employed by Plato to describe the Receptacle. Throughout the *Timaeus* the Receptacle is referred to by language that indicates it is to be understood not as a material principle but simply as space. 52b1, 52b4, 52d3, 53a2, 53a6, 58a7 are all occasions when Plato calls it space or place. Imagery that

²⁵⁰ *Tim* 49a.

²⁵¹ Options comprehensively discussed by Algra 1988. Lloyd-Gerson, 1996 pg. 59, suggests that there are significant similarities between the Receptacle and Aristotle’s matter.

suggests space rather than matter is constantly used, e.g. mother²⁵² 50d2, 51a4 and foster mother/nurse, 49a7, and 52d5. It is also frequently referred to as *en hoi* rather than *ex hou*; strongly suggesting space or place over matter, especially in the sense that is the subject of this thesis. However Algra²⁵³ argues that if the Receptacle is taken as space it commits Plato to two different conceptions of space. But this is compatible with the complicated nature of Platonic space as will be seen. The Receptacle is not normal space but, rather, space for geometrical points and is three-dimensional space because of the configuration of the objects it contains. Algra's criticism of the Receptacle is valid only if we understand the Receptacle as space in a common sense way. The reason that Algra is led to reject Archer-Hind's statement that the Receptacle is a "masterly piece of analysis"²⁵⁴ is partly because he rejects the usefulness of the Unwritten Doctrines (which underpin my interpretation as will be shown in the next chapter), but also thinks that each Platonic dialogue can be understood alone²⁵⁵. This, as explained in the introduction to this thesis is position that I disagree with. Each dialogue is part of a systematic, developing, theory and is not designed to answer all questions but rather to introduce and remind. As such looking at a dialogue, and any doctrine, in isolation will inevitably lead to false conclusions.

The strongest reasons for supposing that the Receptacle could be matter for Plato are the fact that it is one of the things that is said to exist in the pre-cosmos and the use of the gold analogy and perfume analogy to explain its nature. The gold analogy occurs at 50a-c in an effort to explain the Receptacle. In it Timaeus discusses how shapes that are modelled in gold are transient and how it is more correct to say that the gold exists more than these shapes do since it is constant through the alterations, while the figures change constantly:

Imagine that a man were to model all possible figures out of gold, and were then to proceed without cessation to remodel each of these into every other, - then, if someone were to point

²⁵² Although Algra, not unreasonably, understands the term "mother" to denote materiality. Discussion of female imagery will take place in chapter 4.3.

²⁵³ Algra1988, pp. 72-120.

²⁵⁴ Archer-Hind, 1888, pg. 44. Though I must agree with Algra that the description of the Receptacle as a "masterly piece of analysis" is generous to say the least.

²⁵⁵ Algra *op cit.* pp. 75-76. A point with which I agree with Algra (pg. 82) is when he states that we should not take Plato to have the same understanding of matter as we do. We understand matter as a corporeal substance in the modern stereotype but there is no reason (and I will develop this in the next chapter) to suppose that Plato did.

to one of the figures and ask what it *is*, by far the safest reply, in point of truth, would be that it is gold. (Trans. Bury)

This passage suggests that the elemental triangles can be broken down, or are at least transitory when compared to what underlies them. The passage confuses the issue by suggesting that the triangles are made out of something while the rest of the dialogue suggests that the Receptacle is not of such a sort as to have things made out of it. However we can understand the shape of the triangles as being in the gold much as the geometrical or elemental figures would be in space. To take the important message of the gold analogy as being that the Receptacle is matter or that the sensible world is shaped out of it is, I believe, to place the emphasis in the wrong place²⁵⁶. The gold analogy builds on the previous explanation of the sensible world by reinforcing its transitory nature. The point is not to tell the reader that there is a permanent material substrate that is worked by the demiurge; but to show that just as a figure made of gold can continuously change in and out of existence, and so have only a very bare claim to existence, so in fact do all objects in the world have only a very bare claim to existence. The gold analogy concludes by saying that there are three things: "the Becoming, that 'wherein' it becomes, and the source 'wherefrom' the Becoming is copied and produced."²⁵⁷ There is no mention that that "wherein" should be thought of either as matter or in fact identifiable with the gold in the gold analogy beyond its permanent nature. The elemental triangles breakdown and alter their configuration while the Receptacle is constant and unalterable.

As well as the gold analogy the perfume analogy which follows is also taken to be proof of Plato's intention to view the Receptacle as a material principle. But, like the gold analogy, such an interpretation places the emphasis on the wrong aspect of the analogy. 50e states that:

Wherefore it is right that the substance which is to receive within itself all the kinds should be void of all forms; just as with all fragrant ointments, men bring about this condition by artistic contrivance and make liquids which are to receive the odours as odourless as possible. (Trans. Bury)

²⁵⁶ A point made by Algra, 1988 pg. 82: "But nothing in the text suggests that it is this *corporeal* character of gold or wax which furnishes the *tertium comparationis*".

²⁵⁷ *Tim.* 50c-d.

The point of this passage is not to show that the Receptacle is liquid any more than the gold analogy was to show it as being material. The perfume analogy shows that what receives form must be as far as is possible without form in itself – exactly as the Stoics claim of their material principle. Just as the gold analogy showed the impermanence of the sensible world and not the materiality of the Receptacle so to the perfume analogy does not imply that the Receptacle is material but only that it is formless. The gold analogy showed that it is persistent, the perfume analogy that it is without form itself. Taken together with the fact that Plato repeatedly calls the Receptacle space or place it seems clear that Plato does not intend it to be understood as a material principle²⁵⁸.

If it is space and devoid of all form and it comes after Timaeus has explained that the elements are responsible for the three-dimensional nature of the world then it seems that even as space the Receptacle is devoid of this basic quality. What then is it space for? It seems reasonable to suppose that at base the Receptacle is space for the geometrical triangles and their constituent parts – geometrical points. Clearly points have no extension, but they do have location. This is perhaps what the Receptacle functions to provide: the non-extended location for geometrical points. Subsequently, ontologically speaking, the fact that there are four elements serves to make this location three dimensional²⁵⁹.

This account relies on some as yet un-established notions of the role of mathematics in Platonic physics. But as I understand the dialogues as connected by a persistent theme, albeit one that obviously develops, this is not a problem. Further, as the dialogues are to be understood as teaching aids or to jog one's memory we should not expect either a full account or a clear account. Most teaching, as Dillon points out²⁶⁰, was oral. We place such a heavy emphasis on the written works because that is what we possess, but in reality they are merely signposts to the oral discussions and conclusions reached in the Academy. The basis of the geometrical interpretation that would require a substance such as the Receptacle, which supplies only location,

²⁵⁸ Algra, 1988 pg. 85, takes the rejection of the Receptacle as matter to imply the rejection of the concept of matter in Plato's thought. But this is not the case; the Receptacle is just the wrong thing to be matter in Platonism. Instead it will be shown to be abstract geometrical points. Algra's assumption is that there is actually a candidate for matter in the *Timaeus*, and this is not the case.

²⁵⁹ See note 219 above.

²⁶⁰ Dillon 1996, pg. 338.

will be shown in the next chapter as it will be seen to have its origins in the second half of the *Parmenides* and the complex metaphysics that is explained there. In conjunction with the Unwritten Doctrines the second half of the *Parmenides* will be seen to form the mathematical and ontological basis for Plato's physics which as we have seen does not require a prime matter in a common sense notion. Instead what we have is a set of geometrical points that are the basis for elemental triangles that are in turn the basis of the macrocosmic world.

2.1.3 Concluding Remarks About the *Timaeus*:

The *Timaeus* is the obvious and necessary starting point for any discussion about Platonic physics. Despite being the only dialogue which is explicitly about physics its main explanations are based on principles established in other works. Zeno studied at the Academy and it was his teachers there who are the only ones likely to have dealt with physics and Chrysippus certainly seems to have had knowledge of the work too²⁶¹. There are some striking and immediate similarities to be found between Stoic physics and what is said in the *Timaeus* and some more subtle connections which will become apparent after further analysis of other Platonic teachings.

The most striking connection between the *Timaeus* and Stoic physics is the world-soul. The account of the world-soul's creation is complex and relies on harmonics and mathematics to link the world-soul's nature to that of the sensible world. While the demiurge stands removed from the object of creation and the model of creation, making the object resemble the model as much as is possible; the world-soul exists immanently in the object of creation while looking constantly at the model connecting the two through his intellect. Not only does Plato tell us that this is so²⁶² but a human soul can experience the forms and so it seems likely that the world-soul would be able to do so too. There is also the fact that the world-soul is created of indivisible ingredients as well as divisible ones and this is inexplicable if it is not in order to allow it to be acquainted with both the forms and the sensible world. The demiurge, aside from his creative aspect, has little in common with the Stoic active principle. But in terms of active principle in the world the world-soul is much more strongly connected. It has been argued²⁶³ that Polemo's understanding of god is the main influence on Stoicism on the basis of a single fragment: "Polemo said that the world is god", and by arguing that Cicero's account of Antiochean physics in his *Academica* is actually Polemo's physics. These arguments and considerations, which will be argued against in the next chapter, are not required to move from Platonism to Stoicism. The world-soul is immanent in the world and, as his name suggests, has the same existence as the active principle that Sextus described – that the power in the material principle is nothing other than the power in us, viz. soul. That the world-soul is created need not pose a problem since this understanding was explained

²⁶¹ See note 3 above.

²⁶² *Tim.* 37c.

²⁶³ Sedley 2002.

away as a teaching aid almost as soon as it was proposed²⁶⁴. If there is in fact no creation of the world, and by extension the world-soul, then it seems that the world and world-soul are eternally conjoined and never separate just like the active and passive principles in Stoicism. It is also extended throughout the world and “knows” every part of it, knows the forms and is not anthropomorphic. The active principle of the Stoics is likewise extended throughout the passive principle (and hence the world) nor is it anthropomorphic and since the objects in the world are the thoughts of god and there are no external forms then the Stoic active principle, like the Platonic world-soul, “knows” the forms. This notion of being extended throughout the world is interesting. If this is thought about from a Stoic perspective, when the assumption that everything that exists is material is implicit in their philosophy, then it seems reasonable to assume that the world-soul would be conceived of as material. However in the *Sophist*²⁶⁵ Plato explicitly criticises those who take all things to be material. It is highly unlikely then that Plato could ever mean for god, as we may understand the world-soul, to be thought of as extended throughout the world in a material way. This can be supported by Neo-Platonic evidence that we met above in chapter two in the discussion of *krasis*. Two bodies may be in the same place if one of them is immaterial. The mathematical nature of the world-soul should perhaps be taken as indicative of its immaterial nature which allows it to be extended throughout the world. There is one other hint though that may have made a Stoic reading the *Timaeus* pause for thought:

It (the universe) has come into existence; for it is visible and tangible and possessed of a body; and all such things are sensible, and things sensible, being apprehensible by opinion with the aid of sensation, come into existence, as we saw, and are generated²⁶⁶. (Trans. Bury)

Combined with Timaeus’ earlier statement that things which partake of Becoming come to be as a result of a creator we can see if a Stoic may not wonder: if the world-soul has come into existence could it not be that it is tangible, in other words could it be a body? This does rely on the inverted logic that all “A”s are “B”s so all “B”s must be “A”s which is clearly not true. However such a thought may make a

²⁶⁴ Cf. *De Caelo* 279b32ff. Speus. Fr. 61b Tarán; Xenocr. Fr. 156 IP.

²⁶⁵ 246a-b where Plato criticises those who try to bring everything below the level of the heavens.

²⁶⁶ *Tim.* 28c

Stoic look at the *Timaeus* in a more sympathetic light and perhaps inspire them to look at the text a little more.

The account in the *Timaeus* is confused. It describes the creation of the body before that of the soul and then claims that the soul is older and uses the elements to explain two different things in the world which require them to be understood in different ways. Indeed, Timaeus himself is sensible to the problems which he faces and when he begins his discussion he asks his audience to remember that he can only offer them a *mythos*. He invokes the gods twice in his story asking for their aid in this most difficult of tasks²⁶⁷. This caution in physical explanation is understandable considering Plato's emphasis on the immaterial realm of knowledge over that of the sensible world of opinion. It is precisely because the sensible world is one that changes and is "never the same" that the account can only ever be a likely story²⁶⁸ and not a true explanation. The imperfection of the sensible world for proper philosophical debate is shown by the creation of the world-soul where the ratios that go to make it up are imperfectly left at 256:243. If the account was perfect then the ratios would surely not leave this unsatisfying "gap". For Plato physical examination will inevitably result in failure. It does not seem unreasonable given this that if we really want a true explanation of a material principle we would be better off looking not at the sensible world but at that which it is an image of.

The sensible world can be reduced to the elements and the elements to the geometrical shapes which are in turn reducible to the two sorts of triangles. These in turn have their basis in mathematics, the perfect science, which relates to the formal level. The sensible world is based on the formal via this science and the forms, as will be shown in the next chapter, have their nature perfectly explained through the medium of mathematics indeed are most likely mathematical in essence. The Receptacle forms the sensible basis for the instantiation of mathematics from pure arithmetic and numerology to geometrical/sensible instantiation by simply being "space" for the geometrical entities to appear in. This results in a sort of cosmic join-the-dots, which, as will be seen, is essentially the model that can be found to describe Stoic prime matter. Both the Platonic and Stoic matrix/matter can be regarded as mathematical principles. Whereas the former exists as a "material" principle most clearly and perfectly at a metaphysical level, for the latter the sensible

²⁶⁷ *Tim.* 27c and 48d.

²⁶⁸ A point argued for by Archer-Hind, pg. 15, on the basis of the Heraclitean influence on Plato.

world and its passive principle is the material principle *par excellence*, but it could not have been conceived as it was without the mathematical predecessor found in Plato and the Old Academy.

It is in this wider context of Platonism as a system and growing school that the development of the Stoic material principle must be viewed. Through the thoughts in other dialogues such as the *Philebus* and *Parmenides* and the developmental explanations found in the Old Academy the connection between Platonism and Stoicism will become clearer. The *Timaeus* forms an entry point to the discussion of the sensible world built upon the metaphysics of the *Philebus* and *Parmenides* which can only be properly understood via the medium of the Unwritten Doctrines.

2.2 Aristotle and Matter:

Speusippus and Xenocrates²⁶⁹ built upon the work of Plato without, in my opinion, radically altering it. Their enterprise was rather the explanation and simplification of the complicated metaphysics found in the second half of the *Parmenides*. This role, as codifiers, does not detract from their importance or indeed ingenuity as philosophers. Indeed the explanation of what is an intricate metaphysics is no easy task and could not have been undertaken by anyone who was not a philosopher in their own right. We know that these two philosophers were familiar with the *Timaeus* and made some comments on it thanks to Aristotle:

Xenocrates and Speusippus, in attempting to come to the aid of Plato, claimed that Plato did not hold the cosmos to have been created, but was uncreated, and had portrayed it as created only for purposes of instruction and for the purpose of explaining and understanding this situation more clearly²⁷⁰.

There is clear dispute here between the pupils of Plato. Aristotle does not appear particularly impressed with Speusippus and Xenocrates' claim that the creation of the world is allegorical. It is possible that Aristotle is merely being argumentative but what it shows is that Plato did not necessarily explain his own doctrines. Even his most intimate pupils could argue about what was meant. Doctrine was not hard and fast but open to interpretation. Aristotle's metaphysics differs substantially from that of his contemporaries at the Academy. While Speusippus and Xenocrates continued to develop metaphysics and physics along mathematical principles Aristotle took a different approach. Aristotle was really first among philosophers to spend a substantial amount of time analysing matter as an object in the way we are looking at it here²⁷¹. Although I do not believe that the Stoics were ultimately directly influenced by Aristotle in a positive way, his discussions render more accessible the concepts under discussion. It is also interesting to note that he is the first person to use the term *hylē* in the sense of matter.

²⁶⁹ The two successors to Plato as heads of the Academy. Speusippus was Plato's nephew and Xenocrates a student who was certainly in Plato's inner circle (cf. DL IV 8).

²⁷⁰ Scholion on Aristotle, *De Caelo* 279b32ff. in *Cod. Paris. Graec.* 1853 (=E), p. 489^a9-12 (Brandis) (*De Caelo* 279b32ff). Speus. Fr. 61b Taran; Xenocr. Fr. 156 IP.

²⁷¹ Though Aristotle himself says that it was Plato who first devoted energies to understanding matter – *Physics* 4.2 209b15.

In his various discussions of matter he looks at proximate matter, intelligible matter and prime matter. However while the first two he undoubtedly accepts as real aspects of the world it is less clear if he accepted prime matter. I will argue that whether or not Aristotle accepted that prime matter is a part of the world his philosophy as a whole certainly strongly implies that it is. Although Aristotle argues that his contemporaries, Speusippus and Xenocrates, are mistaken on most things he accepts the notion of an intelligible matter with them. Unfortunately he does not go into great detail about what this matter is like while its equivalent in the metaphysics of Speusippus and Xenocrates is the subject of detailed discussion. Aristotle is sympathetic to the notion of a basic "out-of-which" but it is his sympathy to this basic notion that allows ambiguity to creep into his discussions.

On the one hand he accepts, as the Stoics would later, that everything (at least in the sensible world) is a compound of matter and form; but on the other he has a habit of defining the matter part as: "by the matter I mean, for instance, the bronze."²⁷² When we talk about matter and form being the two constituents of all things it is strange to think of the material aspect already having some form, in this case being "bronze". However Aristotle is at least open to the possibility of a bare matter as he discusses it at *Metaphysics* 1029a16-24. In this passage he characterises matter just as would be expected: "by matter I mean that which in itself is neither a particular thing nor of a certain quantity nor assigned to any other of the categories by which being is determined." This substrate he concludes would be substance, except that it lacks "separability and individuality" which we are informed are thought to belong to substance primarily. This indeed shows Aristotle's reluctance to classify prime matter as substance but it does not show that he thinks it does not exist²⁷³. He does, in the passage, say that: "substance is predicated of matter". If substance is to exist then so too does matter. But this sort of bare qualityless matter lacks individuality and separability so it is reasonable to suppose that for Aristotle as for the Stoics prime matter never exists alone *qua* prime matter and so in itself cannot be classified as substance. However this superficial resemblance is not, I think, enough to say that Aristotle is the main source of inspiration for the Stoics *vis-à-vis* the development of their material principle. Since matter never exists independently it must always be at least minimally qualified and

²⁷² *Metaph.* Z.3. 1029a4.

²⁷³ Simplicius understood Aristotle to view matter as indefinite extension on the basis of *Physics* 4.2, 209b6-11 where Aristotle suggests that if place is the extension of magnitude then it is matter.

for Aristotle, as for all ancient writers, the minimal instantiation is provided by the elements²⁷⁴. At *Meteorology* 4 378b33-379a1 Aristotle discusses the notion that matter could in fact be the passive qualities that are associated with the elements earth and water. King²⁷⁵ and Charlton²⁷⁶ use this passage to justify their position that Aristotle neither believed in, nor needed, prime matter. Aristotle himself appears to reject the possibility of prime matter at *De Caelo* 305a22-26:

But, on the other hand, it is equally impossible that the elements should be generated from some kind of body. That would involve a body distinct from the elements and prior to them. But if this body possesses weight or lightness, it will be one of the elements; and if it has no tendency to movement, it will be an immovable or mathematical entity, and therefore not in place at all²⁷⁷. (Trans. Stocks)

Here the elements appear to be the lowest instantiation of a material entity and the geometrical matrix of Plato is rejected. It has been argued that prime matter is unnecessary for Aristotle as he can account for elemental transmutation in a way that does not require anything like prime matter. King²⁷⁸, later followed by Furth²⁷⁹, presents us with a way of facilitating elemental change without recourse to Prime Matter. King insists that the:

hot, cold, dry and moist, are not some anachronistic secondary qualities or even mere "attributes" of matter, but...causes and forces, indeed, the very "stuff and guts" of the elements themselves. In fact, it is simply by virtue of the coupling, mingling, and re-coupling of the contraries that the elements are reciprocally generated²⁸⁰.

²⁷⁴ Freudenthal, 1995, classes Aristotle firmly in the pre-Socratic tradition in his acceptance of the Four elements.

²⁷⁵ King 1956.

²⁷⁶ Charlton 1970.

²⁷⁷ We can see then that King's criticism above is a different way of phrasing an objection well known to Aristotle, but his very awareness should give us hope that he may find a solution. Gill M.L. argues, 1989 pp. 42-46, that there is substantial textual evidence showing that Aristotle disagreed with the concept of a bare potentiality such as prime matter would be in his system.

²⁷⁸ King 1956. pg 378.

²⁷⁹ Furth 1988.

²⁸⁰ King 1956, pg. 378.

The elements, when they change into one another are in the peculiar position of retaining one of the contrarities while replacing the other and so forming a new element. It also explains the rigid method of change; that fire cannot easily change immediately into water without first becoming the intermediate: air²⁸¹.

This is an ingenious interpretation and right in a way (I mean, of course, that this “swapping” of contrarities is most likely the method of elemental change). However it does have the uncomfortable concomitant of making the contrarities something more basic than the elements which they are said of. King’s position is based on strong textual evidence. However there is just as much textual support for the opposing view: that Aristotle had prime matter. There are few texts that actively deny prime matter so in order to support the position that there is no prime matter for Aristotle the position is often reduced to an absurdity:

Even while it lived, the doctrine of *prima materia* remained a subject of mystery and controversy. For in so far as anything has some recognizable character, capable of analysis and therefore exhibiting in discourse some universal characteristic, it is *ipso facto* informed: and in so far as it is informed it is a “this,” a substance, and hence not *prima materia*.²⁸²

More recently Robinson rephrased the situation:

As there is no identifiable matter more primitive than the elements...there is a problem about what underlies such change. The traditional interpretation of Aristotle’s treatment of this problem is that he posits a *prime matter*, a bare “stuff”, lacking all positive determinations, which is the matter of the elements and which makes elemental change possible. This prime matter is nothing but potentiality...²⁸³

²⁸¹ *De Gen. et Cor.* 2.4-5, suggests that it is possible for an element to become its opposite without first actually becoming the intermediate element, though the account is far from clear.

²⁸² King 1956, pg 370.

²⁸³ Robinson 1974-5.

The position of King and Charlton relies on the understanding that some of the elements are active and the others passive. This interpretation is taken up by Freudenthal²⁸⁴ and it is possible that it was taken up by those who were interpreting the Stoics leading to the issues we saw in the previous chapter to do with the nature of *pneuma*. Freudenthal says that the active elements are active because they are hot and cold and these act on the dry and wet passive principles²⁸⁵. It seems likely that the cause of the assertions that we met in relation to the Stoics, that *pneuma* was a compound of the "active elements", can be found in this Aristotelian distinction. Despite the interpretations of Aristotelian physics offered by King and Robinson they cannot escape the language of prime matter. When they deny that it exists they do so in a manner that asserts a mode of prime matter existing that is not accepted even by the Stoics – viz. that it exists by itself as a bare substrate. Neither the Stoics nor Aristotle accept this as a possibility, but it does not then follow that they do not both believe that there is a prime matter "out of which". King rejects the notion of prime matter on the basis that it must always exist informed; but surely if it is informed then it is still prime matter, if it were not then how could it be informed to not allow it to be prime matter? In other words the form/matter distinction would be rejected at this level and there is no reason to suppose that it should be. It was noted above that Aristotle appears to reject the notion of a body prior to the elements. But rejecting a *body* prior to the elements is not the same as rejecting prime matter. Besides prime matter would not, as King rightly pointed out, *actually* exist prior to the elements. For Aristotle the world is eternal, never created nor destroyed there is thus no need to suppose that there is a time when prime matter existed prior to the elements. It is as Robinson said: potentiality. The Stoics think that prime matter is a body, as is their active principle, but there is no reason to suppose that Aristotle thought of it in the same way. We have already seen how Plato's ontology breaks down to the immaterial level to account for the sensible nature of the world²⁸⁶. There is no compelling reason to suppose that Aristotle does not go below the level of the elements in his ontology; but there is likewise no reason to suppose that if he did that he made this prime matter a body.

Apart from proximate or elemental matter from which the world is made Aristotle also discusses the notion of intelligible matter. Despite his contempt for the

²⁸⁴ Freudenthal 1995, pg. 22.

²⁸⁵ *Loc cit.* on the basis of *De Gen. et Cor.* 329a24-31, and *Meteorology* 378b10-25.

²⁸⁶ This account will be expanded upon in the next chapter.

complicated and formal hierarchies of Speusippus and Xenocrates Aristotle is forced to account for the existence of abstracted mathematical and geometrical shapes. They clearly do not exist in the sensible mode as not everything that is conceived of exists in the sensible world. Gaukroger²⁸⁷ argues that Aristotle cannot have purely noetic objects such as geometricals without a sort of matter because if he did then he would be reverting to the Platonic picture. The Old Academic position on this will be looked at in the next chapter. Aristotle's position seems to be along the lines that: just as there is a bare substance under the elements so a similar bare substance exists under abstracted number. This is not the case for the Old Academy as we will see where the matters become increasingly complicated the closer to the sensible they get. Aristotle introduces the notion of intelligible matter as though it were the most common thought:

And some matter is sensible and some intelligible, sensible matter being for instance bronze and wood and all matter that is changeable, and intelligible matter being that which is present in sensible things not *qua* sensible, i.e. in the objects of mathematics²⁸⁸. (Trans. W.D. Ross)

He goes on to expand his understanding and definition of intelligible matter by explaining how those things which are not perceptible will have matter too:

For even some things which are not perceptible will have matter, since there is matter in some sense in the case of everything which is not "what-it-meant-to-be" anything, that is, not its own form itself, but is a "this-something". The semi-circle, then, is not a part of "the circle" in general, but of the individual circles, as has been said before; for as there is perceptible matter, so there is also intelligible matter²⁸⁹. (Trans. W.D. Ross)

All thoughts about a circle are about a particular circle, the circle that is being thought about. As an individual object in the world can be divided owing to its matter so too can the geometrical figure be divided according to its matter. If there is a

²⁸⁷ Gaukroger 1980, pg. 193.

²⁸⁸ *Metaph.* 1036a8-11.

²⁸⁹ *Op cit.* 1036b37-1037a5.

generic intelligible matter which underlies all intelligible change without itself being a particular, and there is no hint that it is a particular, then it seems likely that there will be a parallel in the sensible world.

There are, thus, two ways to get to prime matter in Aristotle. The first is simply through the positive evidence and realising that his system of elemental transmutation just does not make much sense without it. The second is to see the use he makes of intelligible matter and seeing that as a reasonable parallel to the sensible world.

Aristotle himself says of prime matter that it has a good claim to being called substance, good but not good enough. There is also the consistent and strong suggestion throughout his work that if it does exist it does not do so separately. *Metaphysics* 1042b9-11 clearly tells us that matter exists as substratum, and that this is commonly recognized, but that this is to be understood as potentiality. It is because of this potential nature that he rejects it as substance here. He informs us that in the search for substance we must look for what is the matter in *actuality* of sensible things. The account that Aristotle gives at *De Generatione et Corruptione* 329a23ff finalises the understanding of prime matter in an unambiguous and common sense way: "Our own doctrine is that although there is a matter of the perceptible bodies (a matter out of which the so-called elements come-to-be), it has no separate existence, but is always bound up with a contrariety."²⁹⁰ Here Aristotle explains prime matter in a manner that strongly predicts the Stoic notion. We can answer Cohen's question; "Why accuse Aristotle of holding to a bare stuff if he insists that the stuff is always clothed?"²⁹¹ by saying that we "accuse" Aristotle of belief in prime matter because that is precisely what he says. Solmsen²⁹² responded to the similar accusation by King, that it is unreasonable to believe Aristotle believed in prime matter because it never exists *qua* prime matter, in a similar way: that to believe in prime matter is not the same as believing it ever exists separately as prime matter. Sandbach argued later²⁹³ that there was no influence of Aristotle on the Stoics. This claim, too strong to have complete credibility, was looked at in the introduction. It is unlikely that the Stoics were completely ignorant of Aristotle's

²⁹⁰ Trans. Joachim. H.H.

²⁹¹ Cohen 1984. pg 176.

²⁹² Solmsen 1958, pg. 243.

²⁹³ Sandbach 1985.

thought. Whatever influence his teachings had I believe they would have been secondary to the influence of the Academy on the development of Stoic philosophy in general and in physics in particular. The nature of an underlying substrate to the sensible world did not originate with Aristotle. The Stoics would not have had to recourse to his teachings to find this as it was strongly prevalent in the esoteric teachings of Plato and the Old Academy. Rather, if there was influence, it came after the fact. Aristotle does forge one great leap forward in the thought about the material principle, however, and that is admitting of the fact that prime matter is first of all something pertaining directly to the corporeal world primarily. He also builds on the Platonic account by making it clearer that we can conceive of a material principle without having to conceive of it as existing separately by itself. This notion, although present, is not so clear in the writings of Plato or the Old Academy, although it is implied by their discussions. This is the major relationship between Aristotle and the Stoics. But, as Solmsen²⁹⁴ points out, it is possible for two different people to come up with the same point at different times with no connection. However owing to the intellectual climate of Athens and the anecdotal evidence that Zeno studied with many teachers it is so unlikely to suppose that he would have been ignorant of Aristotle's teachings and if his major interest was in the "materialization" of philosophy, that he would not have been drawn to these aspects of Aristotle – for justification or codification rather than inspiration. Aristotle's similarity to the Stoics in terms of the passivity of his material principle and its constant conjunction with an active principle is not enough to claim him as the main influence on the Stoics. These ideas will be seen to exist in Platonism and if Aristotle has them or developed them then it is because he, like the Stoics, was educated in the Academy. Common origin rather than dependence explains better the relationship of Aristotle to the Stoics.

In the previous chapter we noted that there was a strong connection between Aristotle's theory of innate breath and *aether* and the Stoic active principle. Here again we see a strong connection, but one which I feel again comes after the fact. Cicero²⁹⁵ says that Aristotle sometimes calls the world god (an assertion Cicero connects to Plato) and also that the cosmic heat is god. Since this interpretation of Aristotle is not one normally associated with him owing to the account in the *De*

²⁹⁴ Solmsen 1968-82.

²⁹⁵ *De Natura Deorum* 1.31

Anima Hahm²⁹⁶ is cautious in accepting Cicero's account. While caution is undeniably advisable Cicero's story has an edge of plausibility. Cicero attributes these notions to a lost work of Aristotle's, *On Philosophy*, and combined with the account of *aether* and *pneuma* seen in the previous chapter the associations with Stoicism are reasonably strong²⁹⁷. However the connection would appear to be more circumstantial than anything else. If the Stoics were to be influenced by someone to believe that the world was god the most obvious connection is again from the Old Academy. The single fragment that we possess in relation to Polemo asserts that he taught the universe was god and we have seen the account of the world-soul in the *Timaeus*. With the account of *aether* and *pneuma* seen in chapter one the connection between god *qua* world and heat is one that the intellectual climate of the time would have fostered²⁹⁸. It is more likely that any connection between the Stoics and Aristotle is a result of common origins in the Academy and the intellectual climate of the time. It would seem most likely then that any further connection between Aristotle and the Stoics would be more in the vein of the Stoics reinforcing their position in light of Aristotelian arguments than relying on them for the formation of their position.

The accounts of the *Timaeus* and Aristotle furnish the background of the Stoics' belief in, and explanation of, prime matter. The *Timaeus* offers vague and difficult glimpses into the complicated mathematical and geometrical explanations that will be elucidated in the next chapter. The account of matter in the *Timaeus* is non-existent insofar as there is no explicit discussion of it. The discussion that does exist is of geometrical shapes *qua* elements. This account will tie into the complicated metaphysics from the *Philebus* and second half of the *Parmenides*, not to mention that of Plato's students: Speusippus and Xenocrates. The complex metaphysics that comes from the Academy furnishes the bare notion of an underlying substrate of the sensible world that the Stoics would have built on. However Aristotle furnishes the justification, perhaps, of a prime matter that can, in a common sense way, be understood as "material". He explains how it can be an underlying substance without being in and of itself a separately existing entity. His notions of life sustaining

²⁹⁶ Hahm 1982, pg. 60.

²⁹⁷ We noted above at pg. 50 that in *On the Generation of Animals* 736b30-737a8 Aristotle makes use of a "vital heat" in semen which is "analogous to the element of the stars" and I drew a comparison between this and the Stoic account. The suggestion from Cicero seems more reliable when this text is brought in to the discussion.

²⁹⁸ See chapter four for the intellectual climate of the time.

principles and the fifth element also furnish a stronger framework for the Stoics to use to clarify the positions that they would already have got from the Old Academy. We will never know if Aristotle actually accepted the notion of prime matter, or if it was one of those aspects of his philosophy that he felt uncomfortable with and so while he discussed it did not actually endorse it. It is also possible that Aristotle was simply unaware of the implications of his various discussions, though this seems a little unkind to him as *Metaphysics Z 3* suggests that he is unhappy with prime matter as a substance; rather than unhappy with it *per se*. But whether he did or did not personally endorse it Aristotle certainly improved the notion of prime matter beyond the peculiar mathematical-matrix of Platonism. The next chapter will explore the mathematical notion of Plato's esoteric metaphysics from the *Philebus* and the second half of the *Parmenides*. These will be augmented by the Unwritten Doctrines and finally placed in context through their interpretation in the Old Academy where they will have been taught to Zeno and thence to his followers. It will be seen how the written and unwritten works form the level of understanding necessary for the account of the *Timaeus* to be properly understood. While Aristotle renders the notions under discussion more accessible for us it is ultimately unnecessary for the Stoics to have had recourse to his works. All aspects of the "Aristotelian prime matter" can be found implicitly in the Platonic *corpus* and Unwritten Doctrines. The Stoics came out of the Old Academy and even if they did have contact with Aristotle's philosophy it is likely to have influenced any thought only after its initial conception, and the most important aspect of prime matter – the fact that it is devoid of all qualities in and of itself – can be found in the Platonic and Old Academic discussions of matter in their metaphysics which Zeno would undoubtedly have been familiar with.

Chapter 3

3.1 Plato's Late Ontology

This chapter will look at Plato's physics through the medium of his late metaphysics. For Plato the metaphysical is the source of the lesser reality that the sensible realm possesses. It is the area in which is to be found not only the truth of physics (in so far as there is a truth of it) but more importantly the truth about the ethical and good life for man. The lectures given by Plato *On the Good* were heavily Pythagorean in tone and content²⁹⁹: mathematics leading to, or directing, a "good life". Porphyry links the lectures to the *Philebus* and this is the basis of Gilbert Ryle's suggestion that this indicates a "Pythagorean stage" in Plato's thought³⁰⁰. Such a conclusion is supported by Aristotle; by the direction and interest of the members, and heads, of the Academy and not least by the content of the *Parmenides* with which the *Philebus* was so closely connected in the Florentine Platonic revival³⁰¹. The *Timaeus* alone cannot, in my opinion, furnish us with all the information about Plato's opinions about physics for three reasons:

- 1) While it appears to offer us a comprehensive account of physics it cannot possibly do so since knowledge about physics cannot be reached through the pure study of physics or physical phenomena but only through metaphysical discourse.
- 2) I am of the opinion that each Platonic dialogue is not really a stand alone work but can only be fully appreciated in the greater context of the Platonic corpus.
- 3) "Appreciated" only and not fully understood since it is clear from assertions within the corpus and in the seventh letter that truth or

²⁹⁹ Allen 1977, pg. 161, Ryle 1966, pp. 2, 256. That Pythagorean theories may be at the heart of Plato's physics and explanation of first principles may be less surprising if we recall that at *Timaeus* 53d we are told: "but the principles that are still prior to these (the elementary triangles) god knows, and he among men who is dear to him", and that in the *Philebus* Pythagoras is described as close to god and giving man the "heavenly tradition".

³⁰⁰ Ryle 1966, pp. 2, 256.

³⁰¹ Cf. Allen 1977.

knowledge is not effectively conveyed by the written word but only through dialectic and discussion of teacher to pupil³⁰².

For these reasons it is important to look not only at the two most metaphysically complex works of Plato, the *Parmenides* and *Philebus*, but also at the reports of Aristotle concerning the Unwritten Doctrines. These three sources combined with the teachings found in the *Timaeus* will furnish us with the most complete picture of Plato's late ontology. Once a full picture of Plato's late ontology has been established it will be much easier to show the path traced through the Academy to the Stoics. I will not attempt to assess the truth of the statement that the *Philebus* and Unwritten Doctrines indicate a "Pythagorean stage" in Plato's life since the evidence for pre-Platonic Pythagoreanism is slim. However there is undoubtedly influence of the Pythagoreans and their number mysticism in Plato's work, though we are surely at a loss to pick out many significant definite instances. Burkert's³⁰³ reconstruction of Plato's metaphysics relies mostly on Aristotle's testimony (the Unwritten Doctrines) since he is interested in the relationship of Plato to Pythagoreanism. While his reconstruction of Plato's metaphysics resembles what will be shown in this chapter there are necessary differences since Burkert does not use the *Parmenides* or *Philebus* to aid his reconstruction. Where Burkert's fascinating reconstruction leaves gaps and fails to explain the relationship of the account found in the Unwritten Doctrines to the written corpus I intend to use the *Parmenides* and *Philebus* to fill these requirements; though I will be looking at these dialogues with the account of the Unwritten Doctrines firmly in mind. As a result the picture of the forms that will emerge will be rather different from the traditional picture.

The sensible world is a brute fact for Plato; we can say this since the *Timaeus* explains that there was pre-existing "stuff" which was made into the sensible world in imitation of the forms. The sensible world's order, but not necessarily the brute fact that it exists, should be explained by metaphysics. There may be no explanation of why the world exists but since it does we must furnish an explanation of its

³⁰² Cf. Rowe, 2007, pg. 260: 'There is circumstantial evidence that [Timaeus'] capacities are limited; and any rate Plato has, and perhaps will have, plenty more to say than Timaeus says about both the subjects specified, gods and the beginnings of things, and the fact that Timaeus actually recommends not looking any further than what he will be saying seems on the face of it to put him into implicit conflict both with Socrates generally and, in particular, with the Socrates of Republic VI, 504. So long as there actually is more to be said, as Plato seems to demonstrate that he himself thinks there is, Timaeus looks like one of those people whom – with Glaucon and Adimantus in mind – Socrates disparagingly describes as thinking the incomplete "already good enough".'

³⁰³ 1972, pp. 15-28.

relation to its model. The metaphysics that will be explored in this chapter will thus not explain the necessary existence of the sensible world but will explain how it exists in the way it exists. The series of "emanations" from the One that will be explained here could potentially stop before the instantiation of sensible number but if it did so then the sensible world would not be able to have been modelled on a mathematical paradigm. Plato is primarily trying to explain what is and it is beyond reasonable doubt that the sensible world is, at least to a limited extent.

3.1.1 The *Parmenides*

The second half of the *Parmenides* takes as its starting point the discussion of the historical Parmenides' own doctrine of the One. During the conversation about what follows from the assumptions that the One exists and what happens if it has all or none "of these characteristics" the following eight propositions are discussed:

- I. If Unity exists (137C), it has none of these characters (142A).
- II. If Unity exists (142B), it has all these characters (155E).
- III. If Unity exists (157B), the others have all these characters (159A).
- IV. If Unity exists (159B), the others have none of these characters (160B).
- V. If Unity does not exist (160B), it appears to have all these characters (163B).
- VI. If Unity does not exist (163B), it has none of these characters (164B).
- VII. If Unity does not exist (164B), the others appear to have all these characters (165D).
- VIII. If Unity does not exist (165E), the others neither have nor appear to have these characters (166B).³⁰⁴

Discussion of all the hypotheses would be a liberty of digression too far and so I will limit myself to an analysis of the first three. These first three give us all the information that makes the second half of the *Parmenides* relevant to the topic of this thesis. They can be understood as explaining the "emanation" of all levels of reality from the existence of the first One right down to the basic structure that is the sensible world. The second half of the *Parmenides* acts as a way of re-establishing the forms in an altered state following the attack on them in the first half of the dialogue. Plato takes the opportunity in this dialogue to move away from a traditional theory of Forms to a more elaborate but explanatorily more effective one. The character of Parmenides does not want to do away with forms as he sees them as

³⁰⁴ Sayre 2005, pg. 41

indispensable for knowledge³⁰⁵; yet in the first half of the dialogue he has shown the “naïve” understanding of forms to be inadequate. The inability of the earlier theory to account for the nature of the relation of forms to the sensible world is shown all too clearly by the first half of the dialogue; and although Parmenides himself states that what follows will be a “gymnastic exercise” I think it is in fact much more. To set the dialogue in context: it is generally agreed that the writing or composition took place following one of Plato’s trips to the Italian enclaves of the Pythagoreans with whom he seems to have built up a close relationship³⁰⁶. It is the belief that Plato has adapted his theory of forms to utilise Pythagorean notions that underlies my analysis. The relationship of Plato’s later thought to Pythagoreanism and his in depth understanding of it has been shown by Burkert³⁰⁷. Plato takes what is relevant about the physics and metaphysics of the Pythagoreans and uses these things to bolster his own theory so that we may better understand how to lead the good ethical life: i.e. how best to partake of forms. But he also, I believe, took over another thing. That thing is a *penchant* for secrecy. In the *Republic* Plato outlined a strict hierarchical society where each person knows their place and at the top sit the Philosopher Kings. Such knowledge as enables a person to be a Philosopher King would indeed be powerful and by necessity a guarded secret³⁰⁸. The Philosopher King is what he is since he has privileged access to the forms on which the state is modelled. The second half of the *Parmenides* shows us glimpses of the method to understand these models and their relationship to the world. It is not surprising then that we have to use not only our imagination but also our knowledge of other dialogues and any other sources to unearth the true import of what Parmenides is teaching the young Socrates³⁰⁹; letting him into the “sages club”.

The first hypothesis of the dialogue that leads to the possible existence of a transcendent One has an ambiguous relationship to the topic of this thesis. We do not know if this One exists or not, or if that is simply a problem of language. It

³⁰⁵ *Parm.* 135c.

³⁰⁶ The mathematician Eudoxus is said to have joined the Academy in 368 BC, perhaps the year before the composition of the *Parmenides* signifying the seriousness of the words above the entrance: “let no one enter who is not a mathematician.” According to Aristotle Eudoxus tried to make Forms immanent in the world and no doubt utilised his mathematical knowledge to explain how this would work. Plato is also seems to have been friends with both Timaeus of Locri (if he was a real person and not simply a fiction of Plato’s) and Archytas of Tarentum, two eminent scientists, mathematicians, statesmen and Pythagoreans.

³⁰⁷ 1972.

³⁰⁸ The *Seventh Letter* (341b-349b) says that Dionysius had learnt some of the doctrines of the “greatest truths” that Plato had not intended to communicate to him. This could be simply because Plato did not like Dionysius or it could be indicative of a more widespread secrecy.

³⁰⁹ Although it is a young Aristoteles (not to be confused with Aristotle) who answers in this dialectic.

seems that if it does exist (though of course "exist" is the wrong term) then the fact that it exists explains the existence of everything. The Neoplatonists³¹⁰ seem to have liked it and seen it as endorsing a transcendent One so marvellously devoid of anything that it is not even one, nor even is, nor is not. Whatever the ultimate role of this One in metaphysics we cannot know Plato's true opinion in regard to it as he does not tell us. It may be that this One is not the proper subject for a philosopher but rather of some other, possibly higher, discipline or perhaps is a subject fit only for the divine intellect. The fact that it is a super-mystical principle no doubt appealed to the mystical *penchant* of the Neoplatonists.

At the end of the day Plato rejects this notion as either unintelligible or simply not relevant:

Therefore it is not named or spoken of, nor is it the object of opinion or knowledge, nor does anything that is perceive it – It seems not – Is it possible that these things are so for the one? – I certainly don't think so.³¹¹

Whether Plato believes in this One does not seem relevant to this dialogue, nor indeed to this thesis as it cannot have a relationship with a material principle, though it is a small digression on an interesting topic.

The second hypothesis is where things get far more interesting. It appears as though Plato is saying many, if not all things, of the One now. He is interested in a new type of One, without the issues that Parmenides' One had. But we must bear in mind Plato's sense of humour and secrecy and be aware that there may be more going on here than meets the eye. Writing is not the medium for transference of knowledge and so full knowledge will be absent from this, as for all, written work. Like the Pythagoreans Plato is keeping the true doctrines available only to those who deserve them: his students. The key to understanding his complicated arguments must be in the oral discussions that took place in the Academy; which is not to say, as Cherniss would, that we must consign ourselves to never understanding Plato because we do

³¹⁰ Dodds, 1928, demonstrated the dependence of the Plotinian One on the first hypothesis of the *Parmenides*. Rist, 1962, dismissed the influence of a Speusippean One on the Neopythagoreans and hence Neoplatonists.

³¹¹ *Parm.* 142a.

not have access to his conversations³¹². We have access to the doctrines of his successors and the accounts of Aristotle and it is these that must act as the guide to interpretation.

The conclusion of the second hypothesis is that if the One exists then it has all characteristics:

And it has a name and definition, is named and defined, and all similar attributes which pertain to other things pertain also to the one – That is perfectly true³¹³.

If One exists, if there is something, then everything exists. First of all we are told that if the One is then it is in virtue of nothing other than Being: "If one is, can it be and not partake of being? – No, it cannot."³¹⁴ Immediately after this a separate One is split off. This is the One which is the product and which will act on the other product of the One, Being and Difference. It is this fact that suggests that Plato will be using the term "One" in many ways, and that it will be this equivocation that could lead to problems. The difference between these is not to be accounted for in their being One, but can only be accounted for by Difference. We can break the thought down:

1. "is" signifies something other than "one".
2. Whenever someone says "the one is" they mean nothing other than that the One partakes of Being.
3. Being is never absent from the oneness part of the "one is" and unity is never absent from the being part of "one is".
4. Each part is thus composed of two parts; one and being.
5. The being of the One is different from the One since the One partakes of Being.
6. Being and the One are different by nothing other than Difference. So Difference can be neither the same as One nor of Being.

³¹² Cherniss, 1945, pg. 13.

³¹³ *Parm.* 155e.

³¹⁴ *Parm.* 142b.

We have three things: One, Being and Difference. This furnishes the Odd and the Even. It gives us Two and Three, and from Two and Three there is twice and thrice. If there is twice and thrice there is also:

three and twice and two and thrice, must there not also be twice three and thrice two? – Inevitably – Then there would be even times even, odd time odd and odd times even, and even times odd. – Yes – Then if that is true, do you believe any number is left out, which does not necessarily exist? – By no means³¹⁵.

From the seemingly innocuous statement that “the One is” Plato has beautifully created the infinite number series.

These numbers exist, all numbers in fact, we are told “necessarily”. The rationalisation of the indefinite number series which exists by necessity is reminiscent of the notion of reason persuading necessity found in the *Timaeus*. The One³¹⁶ then is both one and many since it has many – the indefinite number series, and is one since it subsumes everything under a whole – the single indefinite number series. Since it is a whole it is limited and if limited then its centre is equidistant from its extremes and if it has a beginning and middle and end then it has a shape³¹⁷.

Plato is here moving incredibly quickly and deliberately obscuring the importance of what he is saying. On the basis of the *Philebus* and Unwritten Doctrines I believe that Plato has moved from ideal number, through mathematical number and is now talking about geometrical³¹⁸, or what is the model of sensible, number³¹⁹. Plato needs at least three sorts of number: ideal, mathematical and geometrical³²⁰. The existence

³¹⁵ *Parm.* 143e-144a. The others are presumably found by addition.

³¹⁶ Perhaps a different One from the One that exists with Being to create the indefinite.

³¹⁷ *Parm.* 144e-145b. Just like the historical Parmenides’ own One.

³¹⁸ Cornford, 1939 pg. 145, also sees 145a-b moving from numbers to geometrical figures along Pythagorean lines. At pg. 153 he is also struck at how we can move from the simple notion of One to deduce the concept of physical being.

³¹⁹ Walker, 1938, moves in this direction with her assertion that the sensible world is a combination of the One with Multiplicity, as that is indeed how the Geometric comes about and the Geometric Number will itself need to be limited by One. She sees Plato doubling up on principles in an attempt to get away from what she describes as: “The facile reduction of the Universe to any single principle – whether Unity or plurality – [this] is inadequate to explain the complexity of the metaphysical situation.”

³²⁰ In the interest of simplicity I would suggest that when Plato talks of “ideal triangle” he is not referring to triangles at the ideal level but simply to the geometrical level since triangles are an “imitation” of “3” and at the geometrical level are still objects of thought and contemplation and hence “ideal” in a sense. At any rate the geometrical level is the model of the sensible and so in that respect ideal since it is the paradigm that the sensible is imitating.

of all three is postulated by this passage but the argument is terribly obscured and justification and explanation of how this happens will have to wait until after the discussion of both the *Philebus* and Unwritten Doctrines.

It seems that when Plato moves onto his discussion of how these numbers have shape and partake of time both becoming older and younger, are in motion and rest, are the same and other than themselves he is talking about nothing other than the sensible world. After all, this sort of language in Plato is most often associated with objects of which there cannot be knowledge: i.e. the sensible world. However since he also appears to identify the number scale, which admits of these things most properly, with the One then he seems to be saying these things of the One. But is it the same One that he began with? The answer to this question will, I hope, become clearer as this chapter progresses. The fact that the One is now said to have shape strongly indicates a shift in focus away from a single One, away from intelligible number, away from mathematical number and points strongly to geometrical number; however the fact that it gets older and younger than itself suggests that Plato could even be referring to the level below geometry: that of sensible number – the numbers that exist in the sensible world. The fact that it is geometry that is used by Plato in the *Timaeus* to explain the sensible world should not be far from our thoughts at this stage. The necessarily existing number has led straight through to geometrical number (perhaps even further) which contains all things and both is and is not the same as itself. It is a remarkably quick demonstration of the necessary existence of the sensible world, paralleled by *Timaeus'* discussion of the necessity of god ordering already existing things. The conclusion of the second hypothesis states that whatever is true of the Others is also true of the One: not surprising since the starting assumption was that all things were true of the One. The Others partake of the One, since nothing is which does not relate to unity and so since one will in some sense be present in all things it follows that whatever existence the Others have they share with the One. But if it partakes of these various ways of being then it does so, not as the first and highest principle but rather as a principle at each level of being each of which has a correlate set of Others. This was shown by the emanation of numbers from the initial One.

The second hypothesis has introduced a One which gives rise to an indefinite number series which ultimately explains the physical nature of the world. This is an extremely

simplistic picture and we will see later on after the discussion of the Unwritten Doctrines that the scheme implicit in this account is more complicated than it at first appears. Although the discussion moved straight from the One to the geometrical numbers we need not fear for the forms. I am in agreement with those that see the forms survive the *Parmenides* albeit in a different guise than they had before. But for a full explanation of the new type of existence the forms have we will have to wait for the *Philebus*³²¹.

As Plato introduces the third hypothesis he explains that those things which are Other than the One are not completely devoid of it: "And yet surely the others are not altogether deprived of the one, but they partake of it in a certain way."³²² These Others, many though they may be, still exist as in a whole and so partake of the One. We are then told that the Others have parts and that these too partake of the One, and each of these is part of a whole and so partakes of the One. The Others have all characteristics, and do so because they partake of the One and the One was shown to give rise to all characteristics in hypothesis two. This discussion has taken the derivatives of the One that we saw in the second hypothesis and slowed the process down. There are the Others which partake of the One. This set of Others is a "complete whole with parts"³²³. These parts are monads, for each can only be a single part if it partakes of the One. However these monads are not *the* One because they partake of the One. Instead they must be analogous to the One. 158b starts the conversation again and states that if something is other than the One then it must in turn be many. We have moved from the Others that are ideal number to the Others that are mathematical number. We can see this because although they are made up of monads (relating to the One) they are also many: "and things different from the one would surely be many". These are unlimited in multitude hence giving us the unlimited number stream that we use for our mathematical calculations³²⁴.

³²¹ Cornford, 1939 pg. 210, sees 158c-d as prefiguring the limit of the *Philebus* as it is the combination of plurality with limit, or the One, which yields the plurality of other ones. At pg. 213 he states that: "Plato, in this revised form, restores the primitive Pythagorean conception of the Limit and the Unlimited as the two chief opposites which combine to constitute Form, numbers, geometrical magnitudes and sensible things. Further light must be sought from the *Philebus*." However Cornford's analysis necessarily suffers with his rejection of the Unwritten Doctrines as a valid source of information.

³²² *Parm.* 157b.

³²³ *Parm.* 157e.

³²⁴ Vlastos, 1981 pg. 381, discusses Krämer's claim: "If there were only the One, there would be no world – neither the world of Ideas, nor that of phenomenal existence."

The first number series, being the first hypostasis from the One will be, I suggest, the ideal or intelligible number series: those numbers that are unchanging and by which the objects of mathematics come to be. We are given no information about these here except that being closer to the One, and hence Being, they are the most unified. The offspring, or parts of this series, will be the number series below ideal number – that of mathematical number. These numbers admit of more multiplicity since they are further from the One. They appear to be derived from the fact that at the level of ideal number there are a multitude of monads. There is the 1 itself, the 2 itself etc. each of which is, as well as being whichever number it is, is also a monad. This would mean that there would be more than one ideal one at the ideal level. This is absurd and so gives rise to the multiplicity at the lower level – the mathematical level. But these too get their unity and being through the relationship that their “parent”, ideal number, has with the One and Being. These Others are both limited and limitless. Mathematical number is a curious thing, and as such is both like and unlike itself: mathematical 2 is both 2 and 1, like and unlike itself. Being derivative of something that is itself only related to the One and Being it partakes of these in limited amounts.

These three hypotheses give us all the information that we need in regard to the nature that late Platonic metaphysics is moving. We have seen that he closely relates the metaphysics of his One and the necessity of Being with the sensible world. Further we have seen that the nature of the sensible world is being explained through the medium of geometrical number which given what we find in the *Timaeus* supports a radical reworking of the nature of the forms. By this I mean no more than that before, in the other dialogues Plato had failed to give a satisfactory account of the mode or method of relation the forms have with the sensible world³²⁵. The *Philebus* will build on this leaning toward mathematics as the common thread between the sensible and ideal realms. An issue that arises, as it arose in the discussion of the *Timaeus*, is: if the sensible world and its relationship with forms is to be explained by way of mathematics why and how is this world said to be imperfect? We have seen clues in the third hypothesis where the Others were said to be both like and unlike themselves. This lack of identity shows the extent of their removal from the One and hence from perfect being. Instead they display the

³²⁵ The Cave and Sun similes and analogies are hardly illuminating to a great degree. The Line provides limited evidence for the role of mathematics as the tool of apprehension of forms, but is nonetheless, limited.

hallmark of the sensible world and inability of something that is not unified to relate properly to knowledge.

The further we move from the One, and the sensible world is doubtless as far removed as can be, then the less strong its relationship with the absolute Oneness and Being. The sensible world is fine in so far as it is what it is and we must understand both it and our place in it but most especially we must understand its and our relationship to the forms and this is done via the medium of mathematics. This gives us the method of study which is necessary in order to determine how to implement the form of, say, Justice. If there were no link between forms and the world then how would thinking about forms help us with our ethical purpose?

3.1.2 The *Philebus*

The *Parmenides* introduced the notion of a highly mathematical and necessary sense of creation. From the sheer fact that there is something we can deduce many modes of existence. The *Timaeus* furnished us with the idea that the sensible world is a brute fact; it exists irrespective of its order. God imposes order on some pre-existing essence of the sensible world. In the *Parmenides* when Plato works out the creation of the geometrical number, and thence implies sensible number, he is explaining the tools by which the sensible world is made to resemble the forms. However the *Parmenides* is a very difficult dialogue and the teachings in it are revolutionary for Platonism, and if the position that the written works only hint and signpost at the true doctrines is right then we must not be surprised that there are still many questions left unanswered. The *Philebus* will fill in some of the gaps that were left by the account above. When Cornford³²⁶ suggested that we seek further enlightenment about the *Parmenides* from the *Philebus* he was undoubtedly right and this makes most sense if we see in the *peras* and *apeiron* parallels to the One and Others. The ideas between the two dialogues are close and the *Philebus* will help to explain the nature of the forms in the new structure explained in the *Parmenides*. That the *Philebus* points in the same direction as the *Timaeus* and *Parmenides* is suggested by the "heavenly tradition" introduced at 16c-e. This is a gift to man from the gods, given by a Prometheus. Timaeus refused to enter into an analysis of the principles of the triangles saying that: "Principles yet more ultimate than these are known only to god, and to the man he holds dear³²⁷". This suggests that there is an explanation and that only a friend of the gods would know it. The *Philebus* implies that Pythagoras is such a friend of the gods and hence it is perhaps in his teaching that the principles are to be found³²⁸. Indeed the above interpretation of the *Parmenides* has shown us that the geometrical numbers rely on a process of emanation from the One. The principles of physics are to be found by the contemplation of metaphysics.

With these ideas in mind the *Philebus* should be able to furnish us with more information about the revised metaphysics of Plato's late ontology. At the beginning of their discussion Socrates questions whether knowing that language is a subject (a

³²⁶ Cornford 1939, pg. 213.

³²⁷ *Tim.* 53d.

³²⁸ The interpretation of Prometheus as Pythagoras is accepted by, among others, Bury, Gosling and Benitez.

single thing) and that we can create an unlimited number of sounds makes us knowledgeable about language³²⁹. He says that knowing that language is both one and many does not make us knowledgeable. Instead when we begin to grasp each of the vocal sounds, knowing how many there are and what they do then we are literate and have knowledge of language. The same is held to be true of music. That we must grasp each of the units that are applicable to that art just as we do with language. The arts of language and music consist of both the One and Many – the One and Others of the *Parmenides*. We saw in that dialogue that all things consist of One and Many. But it is in the limiting of the Many by One, the demarcation of units within a multiplicity that ensure that what is other than *the* One is still something. In unity comes closeness to Being. In the *Philebus* we are now being told that being able to recognise these demarcations and being able to see how they relate to one another furnishes us with knowledge of the things of which they are parts. Two things are necessary for this: that we recognise the art to be both one and many. This will be the case for all things, except the One itself. The further we move from the One the less unified things become and the more they admit of multiplicity.

The *Philebus* ends by giving higher praise to knowledge than pleasure. This, I would suggest, is primarily because knowledge is more unified than pleasure. Pleasure admits of many kinds: eating, drinking, listening to music, contemplating geometrical figures, etc. Knowledge also consists of a multiplicity but to a lesser extent than pleasure since it is directed towards the Good. This is why Socrates relegates pleasure to a lower level than knowledge in his closing remarks. However the real conclusion, for the ethical life, is to live a life not in isolation but in mixture. A life of pleasure devoid of knowledge is worthless, a life of knowledge devoid of pleasure is better but still lacking. Instead, as with all things, life must partake of mixture. We must “limit our lives to prevent multiplicity”, as the One does the Others, and thus limit our removal from the One. This is the conclusion reached at 27d, that a life combining knowledge and pleasure was the best.

The idea that the forms have changed slightly is reinforced by the Theuth language analogy introduced by Socrates at 18b-d. The story explains how a god first realised that sounds that would make up language exist in an infinite variety and that by limiting them he could create the art of literacy. First of all he recognised that vowels

³²⁹ *Philebus* 17b-c.

are not one but unlimited, second he recognised this of semi-vowels, and then of mutes. Having recognised this he proceeded to "limit" each by marking them off into finite number and each of these he called a letter. The story finishes: "And as he realised that none of us could gain any knowledge of a single one of them, taken by itself without understanding them all, he considered that the one link that somehow unifies them all and called it the art of literacy." (Trans. Frede). This *technē* is both one and many³³⁰. It is a single art and there are many parts to it. As an "art" it is a single thing. But there are many ways to instantiate it. There are many languages that exist. Within each language there are also the many sounds that actually make the language up. This is a pattern that is repeated in the *technē* of music. It is a single art but we must have knowledge of the notes and the gaps between them if we are to understand it properly. The Theuth story perplexes Socrates' audience and they wish to know what bearing this explanation of one and many has to their discussion of which out of pleasure and knowledge is preferable. The answer that Socrates supplies shows that the nature of one and many exists in all forms. It is a question though of extent that dictates the preference for one form over another:

This is the very point in question to which our preceding discussion obliges us to give an answer: to show how each of them (pleasure and knowledge) is one and many, and how instead of becoming unlimited straightaway, each one of them acquires some definite number before it becomes unlimited³³¹.
(Trans. Frede)

The dual nature of one and many inherent in each thing that is not the One is reiterated here. The Theuth story has shown that forms partake of this fragmentation just the same as the sensible world does as is shown in the *Theaetetus*³³² and *Timaeus*. Benitez sums up the situation in his analysis of the *Philebus* when he says: "Why someone would not be wise if they knew only an

³³⁰ Benitez, 1989, pg. 40, seems reluctant to allow the unlimited into the forms on the basis that it is unprecedented. However I believe that it is implicit in the *Parmenides* and that we are to use the *Philebus* to improve our understanding of metaphysics. It may be that the doctrine is split over many dialogues and the oral teachings. Besides if the notion is new to Plato then it is hardly surprising that it is unprecedented. However as he goes on (pg. 58) to note, in the *Euthyphro* Plato says that piety is a part of justice and so is hardly denying that each form is a undifferentiated unity.

³³¹ *Philebus* 18e-19a.

³³² *Theaetetus* 152d-153 (Cf. 157b-157c) says that being and becoming are the product of motion and that inactivity result in death. This can only apply to the sensible world and indeed has parallels to the position that I will argue Xenocrates held about the necessary motion in the sensible world for its existence (see below 3.3.3).

undifferentiated unity is easy to understand. Protarchus knows that there is a single class of things called 'pleasure', but he is not wise about pleasure, since he is not aware of its various kinds³³³. He knows that there is a thing called "Pleasure" but he would not know how to relate an instance of pleasure to the overarching form of pleasure. Knowledge that there is a form is useless unless we know about its types.

In order to properly understand the system of unity and many that exists in all things we must turn to the use of the terms *peras* and *apeiron* in the *Philebus*. As Gosling points out, there has been a tradition of interpreting Plato's use of *apeiron* as a first move towards an Aristotelian concept of matter³³⁴. If the *apeiron* was in fact a type of proto-*hyle* in the Aristotelian sense then it would no doubt be this amorphous entity that could be seen as the precursor of the Stoic material principle. However if Plato were to make such a use of that concept in the *Philebus* it is inconceivable that he should be so vague about the subject in the *Timaeus*. So while the *apeiron* is a parallel term to the Others of the *Parmenides* and in some respect, which is yet to be shown, it does act as an "out of which" for the sensible world it is clearly not a primitive version of an Aristotelian matter. The doctrine of the limit and unlimited is explained as having come down to us mortals from the gods, more directly from a particular friend of the gods: Prometheus. It was noted above that the common interpretation of Prometheus is Pythagoras and that it is his teachings that offer us the explanation of things. Aristotle reports that the Pythagoreans taught that everyday objects were made up of numbers³³⁵. The *Parmenides* showed how the existence of the One entailed the existence of all numbers and that this led to geometric number. Geometric number is in turn the tool by which the stuff of the sensible world is made to resemble the first emanation from the first One. It is the teaching that all things contain both limit and unlimitedness, both one and many, that makes each thing what it is and capable of interaction with other things. The heavenly tradition thus explains how all things are both one and many and it is this piece of knowledge that will aid us in our understanding of the sensible world and its relation to forms.

³³³ Benitez 1989, pg. 55.

³³⁴ Gosling 1975 pg. XVII.

³³⁵ *Metaph.* XIII.8, 1083b12 -"bodies should be composed of numbers, and that this should be mathematical number."

The *Philebus* divides the things that exist into four: the limit, the unlimited, the mixture of the two and the cause of the mixture of the two. The unlimited is then explained using the example of temperature. The hotter and colder do not admit of a limit since we can always think of something hotter and colder than the last. This has been understood to indicate that the unlimited is a material substrate³³⁶. However temperature, like language, music, pleasure or knowledge, is a form. It is a form with infinite types in theory but each temperature is actually a monad, marked out by the limit. This is true for any sort of concept that admits of the "more and the less". The unlimited are at this stage left as undifferentiated multiplicities. There is no internal coherence to them. They are a jumble just like the pre-cosmic chaos of the *Timaeus*. This is the role of the limit which in the *Philebus* takes on a different nature than just unity. Instead the limit is formed of the class of things which do not admit of the "more and the less". Instead it is formed of those things which have opposites: the equal and unequal, double and half, etc. These are the sort of "tools" that can be used by god to rationalise the jumble in the unlimited. We are told that it is the presence in the unlimited of the limit that creates the sense of proportion within each unlimited that makes it beautiful. Socrates then moves to the fact that limitation and proportion in things is good for us, for our health and for the world as it is responsible for the seasons. Just as he did in the *Parmenides* Plato moves quickly from one sphere of reality to another³³⁷. The limit will act on the unlimited stuff of the world since the world is a something and the heavenly tradition explained that everything that is partakes of the limit and unlimited. The world is, as is everything, by itself unlimited. It therefore requires limit to rationalise it. This is what the demiurge did in the *Timaeus*. He took a chaos and imposed the uniformity of geometry on it. When Socrates says: "but see what I mean by the third kind: I treat all the joint offspring of the other two kinds (the limit and unlimited) as a unity, a coming-into-being created through the measures imposed by limit³³⁸", he is not saying that the form of temperature or the form of pleasure exists in this world. Rather he is saying that the third kind is the result of the mixture of a limit and an unlimited that exists independently in the sensible realm and the limiting of the

³³⁶ E.g. Davidson 1990 leans in this direction. Bury, Friedländer, Hackforth, Rist, Taylor and Waterfield all subscribe to this view which is not unreasonable given the Presocratic use of the term. Gosling however disagrees, while Benitez seems to think the *apeira* are identical to the Receptacle.

³³⁷ Gosling, 1975, pg. 202, takes the division into four not to be one of genus but of a division into the tools used for understanding the world. This is the position of Benitez, 1989, who appears to sympathize with the notion that the *apeira* are material or quasi-material elements from which the sensible world is formed.

³³⁸ *Philebus* 26d. Trans. Frede.

sensible's unlimited is in imitation of the formal realm's limiting of the formal unlimited. The third kind at the formal level is the unlimited that has been limited. It is the undifferentiated temperature scale differentiated. The third kind at the sensible level is the unlimited stuff of the sensible world limited so that it resembles the formal world. It is this "stuff" of the sensible world, the pre-cosmic "stuff", the principles known only to god and his friends that is the object of the search of this thesis. It is not though as has been supposed that the "unlimited in general" is a material substrate. Plato constantly uses the same term to denote many things at many different levels. This has the advantage of ensuring the connection between those levels and the advantage that the uninitiated will be lost by the results of such equivocation³³⁹.

The "things which are said always to be" could be interpreted in any of four ways as outlined by Benitez: "(I) as referring to sensibles only, not to Forms. (II) as referring only to Forms. (III) as referring, *separately*, to sensibles and to Forms. (IV) as referring, *collectively*, to Forms and sensibles."³⁴⁰ He concludes his investigation of the phrase by saying: "[the phrase] does not refer separately to Forms and sensibles. It refers to Forms and sensibles *collectively*, as members of the open set of things named by a general term."³⁴¹ Benitez uses this option to argue that "unlimited" refers not to some aspect of the form, but rather the form and all its types which comprise then a limited part of an unlimited set of things comprised by a general term³⁴². However it seems most likely that the "things which are said always to be" refers to both forms and sensibles in the same way meaning simply that everything that exists consists of both one and many. When Socrates assigns pleasure to the class of the "boundless", he is doing no more than saying that pleasure is less unified and has many kinds. It is removed from the One. Socrates is not arguing that it is a sensible object. 27b1-2 implies that Mind is the cause of all mixtures, including those at the formal level, and while Benitez does not think this should be taken seriously I can see no reason why it is implausible. The forms require limiting and rationalising in the same way as everything else. The *Parmenides* produced undifferentiated series and these would be limited by god to

³³⁹ Gosling, 1975, pg. xvii, understands the talk of mixture to be of concepts – whose disposition account for the material world - but understands that the interpretation of the *apeiron* as a move towards matter is understandable given the language used in the dialogue. Benitez, 1989 pg. 63, sees the use of *peras* and *apeiron* change during the course of the dialogue.

³⁴⁰ Benitez 1989, pg. 39.

³⁴¹ Ibid pg. 41.

³⁴² 1989, pg. 56.

ensure that partake of the One as much as possible. The forms act as the model for the sensible world but the One acts as model for the formal world.

The tools of mathematics give us the method that god had. He used his tools to delineate the forms and then to rationalize the world. We can use the same tools to understand the process that god used. If we do so then we will understand the forms and then strive for unity as we note that all things come to be from the One and are more real the closer to the One they are.

The *Philebus* has reiterated the notion that unity and multiplicity are to be found at all levels of reality; that all things naturally partake of multiplicity and require a principle of demarcation. We can know what is higher up, and therefore more worthy of our time, by finding out its various kinds. The more kinds a form has the less unified it is and the further from the One it is. The further from the One something is the less worthwhile study of it is. That is why pleasure is first of all shown to have many parts and then shown to be inferior to knowledge. That mixture is not something we should be ashamed to posit of the forms is shown by the assertion that the good life is one which partakes of mixture. The implication from this dialogue, along with the interpretation from the *Parmenides* is clear: the sensible world is the most removed from the One and therefore deserves less of our attention. It does however exist and its relationship to the formal world is strong.

3.1.3 The Metaphysics as it stands

The *Parmenides* has furnished us with part of an explanation of the direction that Plato's metaphysics was moving in towards the end of his life. The *Philebus* has, as Cornford suggested, furnished us with further information. This section will summarize the picture of the metaphysics so far. The picture will be seen to be incomplete and hence the next section will complete the account by appealing to the Unwritten Doctrines. The *Parmenides* serves to vindicate the existence of the sensible world as a necessary emanation from the One. If the One is then the world is. This notion mirrors the lack of envy of the demiurge described in the *Timaeus*: the notion that goodness always spreads itself. The demiurge orders the pre-cosmic chaos because he has no share of envy: it is incumbent upon him to do so given his nature. Likewise the One necessitates things other than the One owing to its very nature. The *Parmenides* suggested the change in nature of the forms from purely abstract concepts to a mathematical relationship of resemblance. The *Philebus* built on this idea suggesting how a system of limiting may be the way to understand the revised nature of forms in this later metaphysics. The system that appears in these dialogues is different from that of the earlier ones and the difference is most likely attributable to a Pythagorean influence. Not only has Plato's system become more mathematical, primarily I believe to explain in a more rational way the system of resemblance, but it has also become more hidden.

The second half of the *Parmenides* started with the simple assertion that the One is. Although it is postulated as a doctrine of Parmenides himself it is a reasonable starting point for a Platonist. Indeed at *On the E at Delphi* 393b Plutarch expresses the integral importance of the One: "Being must have Unity, even as Unity must have Being." If there is something then there is One, and it is pretty clear that there is something. The One of the *Parmenides* was shown to be because of nothing other than Being. If this is the cause of the One's being then it is not the One. If they are not the same then they are different by nothing other than Difference. It was this train of thought that led to the creation of the indefinite number series. This is most likely a timeless process and although "emanation" suggests a process it is the most convenient term for the relationship of the One to the Others and lower levels of reality. Everything that exists does so because of the One's relationship to Being. The One's "offspring", the Others, are an unlimited stream of numbers. The text, as

we saw above, moves very quickly from the immediate offspring of the One to the geometrical level. The intervening stages will only be able to be described or understood with the aid of the Unwritten Doctrines³⁴³. The geometrical numbers which we end up with are the models that the sensible world is based on. In some respect they move and have shape³⁴⁴. It appears that the principles of the basic geometrical propositions - the point, line, surface and figure - will also be the principles of the elemental triangles that Timaeus stated were known only to god and those whom he loves. But since these principles and the method by which the geometrical principles are actually derived from the One are not explained the *Parmenides* we cannot prove to be a friend of god's. The One of the second hypothesis is a One that is different from the One of the first hypothesis. Whereas the first One had no characteristics the second One has all characteristics; that is what makes the discussion, in the end, turn to be one about the principles of the sensible world. The Others are intricately connected to the One. They are in a way a part of the One, because as we saw Plutarch suggest all things that partake of the One as well as of Being if they are to be. To disentangle every mention of a One from that of the Others is not only fruitless it is simply impossible. The *Parmenides* thus furnishes us with a very sparse background of the metaphysics that will form the basis of Platonic physics and the analysis of the material principle of the sensible world. I would suggest that the limiting principle of the One that exists at each level is internal to that which is limited. The One at the level of ideal number is an imitation of the One above, but internal to the number stream that makes up the ideal number. Likewise the One at the mathematical level is an imitation of the One at the ideal level and is internal to the mathematical number stream, and so for the geometrical level. This notion of the limiting principle being internal to the subsequent mixture is expanded on in the *Philebus*.

The *Philebus* analyses the nature of the forms in the new system. It offers an account that reiterates the close connection of the One and Others. Each form is compounded of unity and multiplicity. The terminology has changed and is deliberately suggestive of Pythagoreanism indicating that it is in the interaction of number or in an analogy to this that the basis of reality is to be found. The nature of

³⁴³ Although it is perfectly possible to fill in the gaps without the aid of the Unwritten Doctrines to do so would be pure speculation and although some may question the veracity of the Unwritten Doctrines it is better to have some evidence in support of an interpretation than none.

³⁴⁴ Astronomy is solid geometry and this requires movement and shape.

the forms is suggested as comprising of both One and Many. As we expect given the *Parmenides* the closer to One in nature something is the better it is. Knowledge, owing to the fact that it is less differentiated – has fewer types - than pleasure, is judged highly. The sensible world, by extension, owing to its inherent fragmentation and multiplicity is obviously judged lowly. The limit and unlimited used in the *Philebus* have clear parallels to the One and Others of the *Parmenides*. They are the “stuff” of the forms and indeed of all things to some degree. The limit is described as mathematical principles and it is these which curtail the unlimited to resemble the One as much as possible. But again the *Philebus* account does not offer us an explanation of the emanation from the first One and how it relates to the formal level. Nor does it really explain the connection between the formal level, which is the subject of the *Philebus*, and the sensible world. The situation remains ambiguous in its details.

We have a One at the highest level from which emanates necessarily, given the fact that it is, an unlimited number stream. This is limited by an inherent one. This gives rise to the forms. They are the result of an implicit limiting by a One that is necessarily present in any multiplicity. Owing to the nature of the unlimited there can clearly be many forms, though not an unlimited number since the forms must be closer to the One than sensible things – and even these are not entirely unlimited in number. The forms are created by the limiting within their unlimited nature to a finite series of modes of being. The more of these a form has the lower it is on the scale of the good. The higher something is on the scale of the good the more we should exert ourselves to identify with it. In terms of a material principle the situation appears quite ambiguous. In the *Philebus* the unlimited is traditionally understood as a material principle. It is that which is acted on by the limit to produce the world. However there does not seem to be much evidence to support the interpretation that the unlimited is a *matter* for the sensible world. Yet in terms of being the passive principle to the limit’s active then the unlimited can indeed be understood as *analogous* to the Stoics’ *apoiou ousia*. The unlimited stream is one part of the nature of the forms, it is the aspect of them that is unlimited in itself but that comes to be limited by the limit. However the difference between the unlimited and *apoiou ousia* are two in number:

- 1) The unlimited still appears to be immaterial in contrast to the definite corporeality of the Stoics' *apoiros ousia*.
- 2) The unlimited still does not appear to be, in any meaningful way, the substrate for the sensible world. There has been only the suggestion that the unlimited is somehow also manifested as the geometrical principles and that for some reason these underlie the sensible world.

Plato is clearly sympathetic to the notion that in every thing that exists (apart from the One, Being and Difference) there is a combination of something activating and something acted on. The limit is the acting principle and is part of the unlimited when they are mixed. In the case of number this is easier to see: the limit is the One (at whichever level) and for mathematical number each number is a collection of monads, these monads are grouped together by the One that exists at the mathematical level perhaps itself the first mathematical monad. As such the limiting factor is both different from that which it limits – because that is unlimited – and the same since it is a part of the mixture.

It is this notion that every thing that exists is a combination of active and passive and that the active and passive are intimately and intractably connected that is the main connection to the Stoics so far. However the relationship of the geometrical principles as underlying the elemental triangles will be seen to have a strong connection to the Stoic notion of *apoiros ousia*. The hierarchical structure of forms will also separate Plato from the Stoics and it remains for his successors at the Old Academy to render the metaphysics more sympathetic to the Stoic position of immanent formal materialism.

The next section will use the Unwritten Doctrines to expand the metaphysics that have been extracted from the *Parmenides* and *Philebus*. In looking at the Unwritten Doctrines the gaps that have been left in the account will be filled out as much as possible and the scene set for the metaphysics of the Old Academy that will have formed the immediate backdrop and intellectual atmosphere for Zeno and thence for his students.

3.2 The Unwritten Doctrines

Aristotle ascribes Pythagorean sounding doctrines to Plato throughout his works and frequently refers to Plato and the Pythagoreans in the same sentence as comrades in arms³⁴⁵. These doctrines only vaguely resemble any teachings found in the Platonic *corpus* and have been dismissed by some as spurious ascriptions on Aristotle's part³⁴⁶. However the closer that we look at them the more serious they appear as indicators of Plato's later thought. For instance, Aristotle's assertion that Plato had as his matter the Great and the Small³⁴⁷ can easily be accommodated to the picture that has been revealed in this chapter. Aristotle also clearly thinks that he can move from one set of conclusions that he has from Plato's works and words to others that are not found in the *corpus* and find analogues between the two. He finds the Great and Small, which he asserts to have been Plato's matter, to be analogous to, or perhaps even another expression for, the Receptacle of becoming in the *Timaeus*³⁴⁸. Plato's most eminent pupil thought that throughout the doctrines found in the works of Plato there exists a consistent metaphysics. That there is an underlying train of thought ranging throughout Plato's works from the *Parmenides* onwards has indeed been one of the major assumptions of this thesis; but another is that the written works are not the sole key to understanding Platonic metaphysics and hence his physics. Rather the written works set out a vague framework filled with questions that invite debate and stimulate the mind to search for answers, but in a way that directs the reader towards a Platonist position. The real teaching is not in writing but in the spoken word. Hence Plato gave his lecture or series of lectures on the Good³⁴⁹. It is from these talks that it is assumed most of Aristotle's statements that have little textual support are believed to have come. These esoteric teachings should be taken seriously as offering an insight to Plato's thought for several reasons:

³⁴⁵ E.g. *Metaph.* III.1 996a6, III.4 1001a9. Vlastos (1981, pg. 401) sees any person attempting to justify an esoteric tradition in Plato simply on the basis of the *Timaeus* as "wasting our time", and in this he is surely right. He is in general sceptical of any account of an esoteric doctrine.

³⁴⁶ Crombie (1963, vol. 2, pg. 441) is of the opinion that the Unwritten Doctrines make so little sense it is like "trying to guess what the defence was by reading the concluding speech of the prosecution" and that if Aristotle's reports are accurate then any competent scholar would assume Plato had outlived his sanity. This is, needless to say, a position I disagree with.

³⁴⁷ *Physics* I.4 187a17.

³⁴⁸ *On Generation and Corruption* II.1 329a14, more properly Aristotle is comparing the "boundless".

³⁴⁹ Simplicius *In Arist. Phys.* I.4.187a; III.4.202b.

1. In his *seventh letter* Plato himself states that writing is not the medium in which knowledge can be properly transferred³⁵⁰.
2. Aristotle's reports fit in to the picture that has been developed here, which is a circular argument, but the Unwritten Doctrines support and develop the picture, they do not create it.
3. The Unwritten Doctrines do indeed seem to have strong parallels to what we know of Pythagoreanism before Plato, which is not very much, and we know Plato had an interest in Pythagoreanism so doctrines which are similar and developments of that school's should be taken seriously.
4. Speusippus' and Xenocrates' systems resemble what Aristotle attributes to Plato lending it credibility.
5. Aristotle is taken to be an accurate source for the doctrines of Speusippus and Xenocrates, as well as many others. He mentions these philosophers in the same context as the unwritten doctrines, why should we doubt his accuracy in this sentence and accept it in the next?

Sayre, in his discussion of the Unwritten Doctrines, offers a different picture. In his opinion we have two options:

1. that Aristotle is simply misreporting Plato: "Aristotle was notoriously unreliable in reporting the views of his predecessors"³⁵¹,

or;

2. that Plato did not write these thoughts down and: "the dialogues which have inspired philosophers for twenty five centuries are devoid of the true Platonic vision."³⁵²

Neither option, as he points out³⁵³, is very appealing. However on balance it is unlikely that Aristotle made up the Unwritten Doctrines, as Cherniss would have us believe, and also likely that the written works are not the last word on metaphysics so we should take the reports with at the least a degree of seriousness. Cherniss'

³⁵⁰ Though the seventh letter may be spurious it is amongst the most likely to be authentic. See note 21 above.

³⁵¹ Sayre 2005, pg. 79.

³⁵² Ibid. pg. 78.

³⁵³ Sayre *loc cit.*

view that the “unwritten doctrines” do not actually apply to a set of lectures or specific teachings but could be simply conversations or points made in discussion is reasonable and has the advantage that off the cuff remarks taken too seriously or out of context could be responsible for any statements that are at variance with the rest or our expectation³⁵⁴. On balance then, it seems reasonable to trust the broader statements of Aristotle relating to the Unwritten Doctrines, and the benefit of the doubt should be given to their accuracy.

If we look at the doctrines that Aristotle recorded for us we will see a complicated metaphysics emerge, but one that will not be alien to us by now. Most of the interesting statements Aristotle has to give us in this area occur in the *Metaphysics*. The first time that Aristotle brings in a doctrine that falls into the sphere of the Unwritten Doctrines is at 988a26: “Plato spoke of the great and the small, the Italians of the infinite, Empedocles of fire, earth, water and air, Anaxagoras of the infinity of homogeneous things.” Aristotle has been discussing first principles, in this case he is discussing the material principle which clearly places Plato in the group he has just mentioned of those who have more than one first principle. That Plato is to be distinguished in philosophy from the Pythagoreans is also clear as the “Italians” are listed separately. Aristotle has here given us a name for the material principle of Plato. That it is meant to be a material principle for the sensible world, and not some kind of matter for the intelligible is suggested by Aristotle’s listing it with Empedocles’ four elements.

This position is echoed by Aristotle in a different work: “Now these are contraries, which may be generalized into excess and defect. Compare Plato’s ‘Great and Small’ – except that he makes these his matter, the one his form, while the others treat the one which underlies as matter and the contraries as differentiae, i.e. forms.³⁵⁵” The excess and defects are the contrarieties of the traditional elements. The Great and Small are being characterised as matter as in the *Metaphysics*. The One acts on the Great and Small, it acts as the limit on the intrinsic infinite unlimitedness of the Great and Small. This One is tacitly identified with the forms which ties the new metaphysics neatly in with the original theory³⁵⁶. The forms still act as the unifying

³⁵⁴ Cherniss 1945.

³⁵⁵ *Physics* I.4 187a17.

³⁵⁶ In the *De Anima* (404b23-27, 404b16) Aristotle mentions that the forms are numbers according to Plato. This has been seen to be the implicit suggestion in the *Philebus* and if this is the case then it makes

or limiting factor on some sort of inherent disorder. The Great and Small are clearly thought to be infinite and in need of limiting: "It is for this reason that Plato also made the infinities two in number, because it is supposed to be possible to exceed all limits and to proceed *ad infinitum* in the direction both of increase and of reduction."³⁵⁷ Although Aristotle says that Plato makes the Great and Small his "matter" this should be understood with caution. The disorder inherent in an infinite which stretches in opposite directions is indeed reminiscent of the pre-cosmic chaos discussed in the *Timaeus* and the One will indeed serve to limit and rationalise it. However the same infinite stretch exists in the forms themselves so the fact that the Great and Small are also infinite is not enough to justify any thought of them as sensible matter. Instead we must look further for this justification.

In explaining Plato's metaphysics Aristotle informs us that Plato taught that there were three levels of reality: "Plato posited two kinds of substance – the Forms and the objects of mathematics – as well as a third kind, viz. the substance of sensible bodies."³⁵⁸ But as Aristotle admits elsewhere this is still too simplistic. It is not just that there are three realms, one with forms, another with numbers and another with the sensible. No: "Plato says it is different; yet even he thinks that both these bodies and their causes are numbers, but that the *intelligible* numbers are causes, while the others are *sensible*."³⁵⁹ Aristotle is here separating out the levels of reality that are the strict metaphysical hierarchy of Platonic metaphysics. The forms are separated out from mathematical number and the "substance of sensible bodies". Number is held by the second account to be responsible for all things and Aristotle suggests that there is such a thing as "sensible number", which given what has been said before would seem to be the most likely candidate for the "substance of sensible bodies."

The connection between Plato and the Pythagoreans is re-established by Aristotle later in the *Metaphysics*:

Further, there is the question which is hardest of all and most perplexing, whether unity and being, as the Pythagoreans and

it all the more understandable how the forms are to perform their function as paradigms. This interpretation is taken up strongly by Sayre (2005, pp. 90-99).

³⁵⁷ *Physics* III.6 206b27 – 30.

³⁵⁸ *Metaph.* VII.2 1028b17.

³⁵⁹ *Metaph.* I.8 990a30-1.

Plato said, are not attributes of something else but are the substance of existing things, or this is not the case, but the substratum is something else.³⁶⁰

This passage reconnects the Unwritten Doctrines to the *Parmenides*. We are told that, just as we found in the *Parmenides*, the One and Being are the “substance of existing things”. They are the principles which function as the ultimate explanation of all things and so in that sense they can be understood as the substratum of reality. The One and Being are not substrates in the sense that *apoiós ousía* is but they are the principles by which things come to be. Any doubt about the nature of the One and Being as principles in the most perfect sense – uncaused and independent – is dispelled by Aristotle’s description: “Plato and the Pythagoreans thought being and the one were nothing else, but this was their nature, their substance being just unity and being.”³⁶¹ There is nothing that either the One or Being rely on. They are entwined perfectly and rely only on each other and together explain everything. This appears to be a rather stronger monistic system than might be expected. However the necessary emanation from the One are the Others. Matter exists necessarily from the existence of the One. Yet the emphasis is certainly on the One as a “higher” principle than the Others as even if there was no time of generation the Others are in a sense posterior to the One. This resembles what we know of Eudorus’ metaphysics and his account of Pythagoreanism. However as Dillon³⁶² points out, there is nothing in Eudorus’ metaphysics and monistic system that could not be found in the *Philebus*. In the *Philebus* Mind acts as the equivalent higher principle over the lower principles of limit and unlimited which it uses: it appears that Plato discussed the possibility of a monistic system too. So too there may be a higher One in the *Parmenides* whose existence necessitates another limiting principle and an unlimited, which could be the predecessor of the Neo-Platonists³⁶³ and Eudorus.

The change in Platonic metaphysics from the naïve position criticised in the first half of the *Parmenides* to what we met in the second and the picture that emerged from the *Philebus* can be explained by the integration of Pythagorean philosophy by Plato.

³⁶⁰ *Metaph.* III.1 996a5-8.

³⁶¹ *Metaph.* III.4 1001a10-11.

³⁶² Dillon 1996, pg. 126. Dillon also argues that it is likely that the forms were numbers and in the thoughts of god, which resembles the account we find in Xenocrates and shows a greater consistency in Platonic thought than some would recognise.

³⁶³ As Dodds, 1928, suggested, cf. Merlan 1975.

It is this fact and Aristotle's method of reporting on the two schools' doctrines that make it, as Burkert³⁶⁴ says, so very difficult to find out what is Platonism and what is Pythagoreanism and in what the substantial difference really consists. The permanent connection and inter reliance of a dualistic principle system that was seen between the One and Others at the lower levels is here repeated, albeit in a different form – though this we should expect given that level's supreme transcendence – as there is nothing being acted on *per se*, the One and Being eternally entwined and to all intents and purposes indistinguishable except in thought. This very clearly parallels the level of interdependence and indistinguishability of the two Stoic principles.

The revised nature of the forms found in the *Philebus*, that they are not in fact entirely one, is supported by Aristotle when he again draws a parallel between Plato and the Pythagoreans:

Some, as the Pythagoreans and Plato, make the infinite a principle as a substance in its own right, and not as an accident of some other thing. Only the Pythagoreans place the infinite among the objects of sense (they do not regard number as separable from these), and assert that what is outside the heaven is infinite. Plato, on the other hand, holds that there is no body outside (the Forms are not outside, because they are nowhere), yet that the infinite is present not only in the objects of sense *but in the Forms also*. Further, the Pythagoreans identify the infinite with the even. For this, they say, when it is cut off and shut in by the odd, provides things with the element of infinity. An indication of this is what happens with numbers. If the gnomons are placed round the one, and without the one, in the one construction the figure that results is always different, in the other it is always the same. But Plato has two infinities, the Great and the Small³⁶⁵. (Trans. Hardie and Gaye, emphasis added)

³⁶⁴ Burkert 1972.

³⁶⁵ *Physics* III.4 203a4-16.

The rejection of the naïve theory of forms in the *Parmenides* can safely be taken to have been as a result of the interaction between Plato and the Pythagoreans. Here we have Plato explicitly placing the infinite in the nature of the forms. The infinite can have no clearer exemplification than the unlimited of the *Philebus* which we saw established as the “material” element of the forms. It is the part that is limited and demarcated to make them useful as paradigms that can then be employed as models on a mathematical scheme. The forms remain incorporeal and so we know that any talk of number in this regard is not in relation to the sensible world and that if anything that sounds similar to this picture is said in relation to the sensible world then it can only be in analogy and not the same objects.

The picture that we have been given by Aristotle reaffirms the idea that Plato’s metaphysics and theory of forms underwent a change and that this change was facilitated by the introduction of Pythagorean theories. The nature of the forms as consisting of an unlimited which is somehow limited and uncontrolled was seen to have confirmation in the words of Aristotle. The Great and Small were introduced as parallel to the One and Others of the *Parmenides* and the limit and unlimited of the *Philebus*. This mirrors Aristotle’s assertion that Plato has three levels of substance – the formal, the mathematical and the sensible. All three levels exist because of the same limiting action on an inherent infinite and the connection between the levels is thus easily understood as akin to an instantiable mathematical formula. However because the different levels rely on different sorts of number, the mathematical on mathematical number the sensible on geometrical or sensible number, the way of instantiation will necessarily be different. This however is not explained in Aristotle; nor is how all this is supposed to relate to the sensible world – but this will be made clear in the next section when the teachings of the written and Unwritten Doctrines are combined into a single theory.

3.2.1 The Written and Unwritten Doctrines

Combining the metaphysics that was gleaned from the doctrines of the *Parmenides* and *Philebus* with the Unwritten Doctrines should furnish us with the most complete picture of Plato's late ontology. Comparing this synthesised metaphysics with that of Speusippus and Xenocrates will place it in context and, I believe, support the idea that this interpretation of Plato is, if not entirely correct, then at least reasonable. The theory is more mathematical and elaborate than anything else in the written doctrines but this should not be a cause for scepticism. The personal connection with Pythagoreanism no doubt played an important role in Plato's revision of his theory and Aristotle is certainly happy to talk of the two in the same breath; an action unthinkable if it were not at least very plausible and it could be so only if the theories are in fact similar. We noted in the introduction Plato's frustration with the Pythagoreans for having a theory that is very helpful but making no use of it themselves. It is plausible that Plato took it upon himself to rectify this under-use of mathematical explanation.

Whatever is made of the first hypothesis of the *Parmenides* it seems unlikely that such a transcendent One has any role in philosophy, though perhaps it does in theology or mysticism. However aside from this One we are offered a second One which differs from the first in that it is, whereas we could neither affirm nor deny this of the previous One. This One is because it is related to Being and Being is a single thing because it partakes of this One. It is a reciprocal relationship and the two are only known to be separate because they are different and are different because they partake of the Different (presumably the Different is, and so partakes of Being and also of One). These three things give rise to the indefinite stream of numbers. We saw Plato move straight from this to geometrical number and the sensible world. It is up to us to slow the process down since there must be intervening levels as Aristotle informs us there are the forms and mathematical before the sensible. The stream that comes from the One is limited. We are not told to what extent they are limited but Aristotle gives us a clue when he says: "he makes numbers only up to the decad."³⁶⁶ The decad contains in principle the unlimited number series since all numbers are made from it. As a supreme principle of number ten seems like a plausible number to stop at. These would be the ideal numbers. They are whole and

³⁶⁶ *Physics* III.6 206b32-33.

unitary. The number 3 that exists at this level is not a collection of 3 X 1 but is a simple 3. It is one thing and has no parts. The same is true of all the other numbers of the decad. It is likely that in some sense these are to be identified with the forms. There could be only ten of them and so we would have a hierarchy of forms, but since in the *Sophist* Plato had already identified the Five Great Kinds it is not unreasonable to expand this to ten. What these would be (apart from perhaps the Five Great Kinds) we are not told, but that some forms are higher than others in Plato's estimation is reasonable. This is especially so given the conversation in the *Philebus* which rates knowledge as higher than pleasure on the basis of its more unitary nature. The ten highest forms would be the unified forms which are closest to the One. Later writers, the Neoplatonists - Iamblichus in particular in his *Theology of Arithmetic*³⁶⁷ - would exploit what they assumed to be a Pythagorean doctrine of identifying numbers with gods. It does not take much of a leap to suppose that Plato heard the Pythagorean saying: "justice is four", and decided that the identification of some forms with particular ideal numbers was reasonable.

We have to move from the ideal numbers down a level but there seems no particular reason to do so. It may be that from the perspective of necessary emanation there is not. However it is a fact that (as far as Plato is concerned anyway) there is mathematical number and that it differs from ideal number. Mathematical numbers are numbers that are themselves constituted of multiplicities. The mathematical 3 differs from ideal 3 in that whereas ideal 3 is a simple thing mathematical 3 is actually made of 1 + 1 + 1. It is not a single thing. It can be divided and be a part of other numbers too, unlike ideal 3. Since this is the case there must be a relationship between mathematical and ideal number. Because mathematical number is we must find a cause for it in the level above. The ideal numbers do indeed create. Each is one and so apart from the first ideal One there are a number of other ones³⁶⁸. This would result in the absurdity of having multiple ideal Ones – absurd because ideal One would then be, in a sense, a multiplicity. I would suggest that these Ones create the next level of mathematical number. That One₁ is the first of the mathematical numbers and exists with an indefinite number stream that is limited according to the

³⁶⁷ The triad is called, "friendship, peace", "harmony", "unanimity", "prudence" and "wisdom". The pentad is sometimes called Aphrodite because it contains both the male and female.

³⁶⁸ This is pure speculation about how the mathematical level would be necessary. There is of course no reason to suppose that the ideal numbers are one in any other way than simply resembling the One. That does not entail the formal existence of individual ones for each ideal number. However it is a convenient explanation.

imposition of form by the One₁. This limiting is done in imitation of the level above. Are these mathematical numbers to be identified with the remaining forms, or do they exist separately but at the same level? We do not know because we are never told.

We are told by Aristotle that the forms are numbers and by Plato in the *Philebus* that the forms are constituted by the limiting of the unlimited which is what the ideal One did to the stream of mathematical Ones₁. However it may be that rather than being identical to the mathematical numbers the forms are analogous offspring of the ideal numbers which can be understood in terms of mathematics. There are two options for the relationship of forms and mathematical number:

1. that the forms (whichever are not the "Ten Great Kinds") are identical to the mathematical numbers (or some of them at least);

or,

2. that the forms are analogous offspring like the mathematical numbers to the decad, but are not identical to the mathematical numbers.

However since we there is no evidence either way we will have to end speculation there; but the second option seems more likely given that Aristotle told us that forms *and* numbers are causes, and forms are presumably still to be thought of as single and so could be only analogously like the mathematical numbers³⁶⁹. This has shown us two of the levels that Aristotle reports exist in Plato's system: the formal and the mathematical. But it is the sensible that is of most interest to this thesis. The method of emanation and limitation we have so far seen points the way for the method of the ordering of the sensible world and the nature of the underlying substrate of sensible things.

The analogous relationship that exists tying each level together continues: "the infinite is present not only in the objects of sense but in the Forms also."³⁷⁰ Just as the first offspring of the One were unlimited and then limited to form the ideal

³⁶⁹ I would suggest that the forms exist separately from mathematical number but are instantiated as mathematical formulae.

³⁷⁰ *Physics* III.4 203a8-9.

numbers and the next offspring were also unlimited before being demarcated as a collection of monads so too does the sensible world have in it the infinite. Again there is no definite account of the necessity of the sensible world. But given the account of the *Timaeus* this is not necessarily surprising. Just as it is necessary to account for mathematical number since we use it everyday, so too it is necessary to account for the sensible world since we live in it. Even so we have jumped a step. For between mathematical number and the sensible world is geometrical number. Geometric shapes exist in the same way that mathematical numbers do. They are objects of contemplation. The geometrical numbers will be the next level down from mathematical number and somehow the existence of mathematical number is not contained in its level but, like ideal number before it, it somehow “spills over” into the next level. The One₂ for the geometrical level somehow limits the infinite number stream into geometrical shapes which are an attempt to “mimic” the ideal number. We can see the clear progression of imperfection the further we move from the initial One. The perfect unity of the first One was captured to its best extent by ideal number, then to a lesser extent by mathematical number, and now it is even more imperfectly captured by geometrical number. These numbers exist as incorporeal extension and are the principles of the elemental figures.

The *Timaeus* tells us that the world is constituted by the elemental triangles and implies that these can be broken down to more basic principles³⁷¹. These more basic principles are known only to god and his friends who we identified above as Pythagoras, the Prometheus and friend of mankind and god. The principles of the triangles in the world will be mathematical principles. But the mathematical numbers are numbers, not shapes. This is why we have the geometrical level. For at that level the triangles will exist in perfection (though triangles are imperfect representations of higher principles³⁷²) to be mimicked by the sensible world. Aristotle has told us that the infinite exists in the sensible world just as it does in the other realms. All other realms have been formed by the limiting of an infinite and it is the case that the demiurge creates order out of chaos by imposing limit. The pre-cosmic chaos is chaotic because it is unlimited. It is, I would propose, an infinite extension, an infinite collection of physical monads. Each divisible monad, which exist in multiplicity

³⁷¹ *Timaeus* 81c – the roots of the triangles can be “weakened”.

³⁷² The “ideal triangle” is still a single thing perhaps but would have to exist at the geometrical level on the account offered here. It is unclear how this ideal triangle would be unchanging or how it would relate to all the types of triangle. It is perhaps possible that “ideal triangle” actually refers to ideal 3 since that is what geometrical triangle is an imitation of.

as the Great and Small, we were told by Aristotle were infinite in *both* directions: there are an infinite number of monads and each monad can be divided into two equal monads *ad infinitum*. These are geometrical points. They have to be limited. Since they exist in this way the only method of order there can be is the imposition of geometrical form. They already exist in space – the Receptacle, which is as multidimensional as the things in it. The demiurge’s action makes the Receptacle three dimensional by joining the infinite number of points together into representations of the level just above – the geometrical.

The sensible world is the end point of the “emanation” from the initial One since it is the final thing to be explained. It has to be explained and have a relation to the forms, which are now understandable in a numerical way, since we exist in it. The sensible world is a brute fact but it must have a relationship with higher, “purer”, levels of reality. The sensible world is made of a matrix of an infinity of points which are collected or limited in imitation of geometrical points³⁷³. They are made to resemble geometrical objects because they cannot be made to directly resemble mathematical or ideal numbers. The forms have been supposed to exist as some sort of mathematical formula and it is this formula, initially expressible in a mathematical way, that is being implemented in the sensible way but as geometrical formulae which are more complicated and thus further removed from the One and so inherently less perfect. The semblance of reality that the sensible world possesses is explained by its relationship to the first One via the intervening levels of reality and emanation.

The final object of the search has been found. The substratum of the sensible world has been found to be an infinite series of points³⁷⁴. These are acted on by a One in a parallel situation to the levels of reality that exist above it. Each level is unlimited until limited by a One_n which in turn forces an “excess” down to the next level where it in turn is limited to make it resemble the One as much as possible for this is the best and inherently tied to Being. The relationship of this to the Stoic *apoiós ousia* will be shown at the end of the next section where the Stoics’ interest in

³⁷³ *Metaph.* A9 992a20-20 appears to say that *Plato* rejected the existence of points and made indivisible lines the principle of lines and we will see *Xenocrates* do something similar. However this passage does not call into question the overall structure that I have been arguing for as it seems reasonable to say that mathematical two has as its principle ideal two, but is “made of” two monads. So too line will have as its principle indivisible line because that is what it is an image of.

³⁷⁴ *Crombie* 1963, vol. 2, pg. 447, says that *Plato* “knew” matter to be a continuum and this is indeed what has been found here.

mathematics will point the way to a more sophisticated understanding of their material principle as a geometrical body infinite in divisible potentiality. The underlying principle of the sensible world for Plato, must, as for the levels above it, be intimately and constantly tied to its limiting or active principle which we know to be the One. The picture that has emerged from the discussion of Plato's written and unwritten teachings is one that actually quite strongly resembles the Stoic position. Any appeal to Aristotle as the "real" or most important influence on the Stoics for their doctrine of matter has thus been shown to be unnecessary and this will be reconfirmed when we see the teachings of the Old Academy who are the indisputable direct teachers of Zeno and so may well be the ancestors of Stoic physics.

3.3

The Old Academy

The preceding section introduced an interpretation of Plato's late ontology based on the dialogues and understood with the aid of the Unwritten Doctrines. The picture that emerged was one of a highly mathematical metaphysics leading to a mathematically based physics. With this interpretation behind us we can see how, in the *Timaeus*, the elementary figures exist in "place" or the Receptacle of becoming, acting as the material substrate of the sensible world in an analogous way to the Indefinite Dyads or unlimited number streams at the higher levels of reality. The elementary figures are the elements of the sensible world owing to the fact that they are the minimum instantiation of sensible reality; if we break them down further we remove their sensible nature. The elementary figures are, at least conceptually, reducible to a collection of points in this cosmic join-the-dots: just as the material principle of the mathematical level is reducible to collections of monads. This peculiar mathematical structure of the sensible world has a relationship to the Stoic account of matter, although the connection may not be wholly apparent at this stage. But there is more to the tradition than simply Plato and the Stoics. After Plato's death the Academy flourished and Zeno himself studied there for a time under its third head: Polemo.

The Old Academy was a continuously existing entity. It thrived after Plato's death producing philosophy and philosophers of both note and merit. However, like the Unwritten Doctrines, the Old Academy has not received the attention it deserves from the English speaking world. The philosophical systems of Speusippus, Xenocrates and Polemo have been brushed aside until relatively recently³⁷⁵. Nevertheless, even if the metaphysical systems of the Old Academy have not been to the taste of all modern scholarship, they constitute the intellectual background in which Zeno studied. In regard to the relationship between Plato and Stoicism these three figures have an obvious place. Not only was Polemo Zeno's teacher but Xenocrates was Polemo's and Xenocrates was a student, along with Speusippus, of

³⁷⁵ John Dillon's work on the Old Academy is of particular note as is David Sedley's paper, *the Origins of Stoic god*, which offers many insights into the atmosphere of the Old Academy.

Plato's. Polemo's apparent lack of interest in metaphysics and physics³⁷⁶, in contrast to Xenocrates, will be shown to be an important consideration in the influence the Old Academy could have had on the development of the Stoic material principle. As interesting as the metaphysical schemes of these successive heads of the Academy are, a detailed exploration of these systems and criticisms thereof is beyond the scope of this thesis. Instead I will focus on how the ideas we saw in Plato were adopted and adapted in their systems and show how the idea of a geometrical matrix continued down to the time of Polemo to have been the interpretation of Platonic physics that would have been passed down to Zeno.

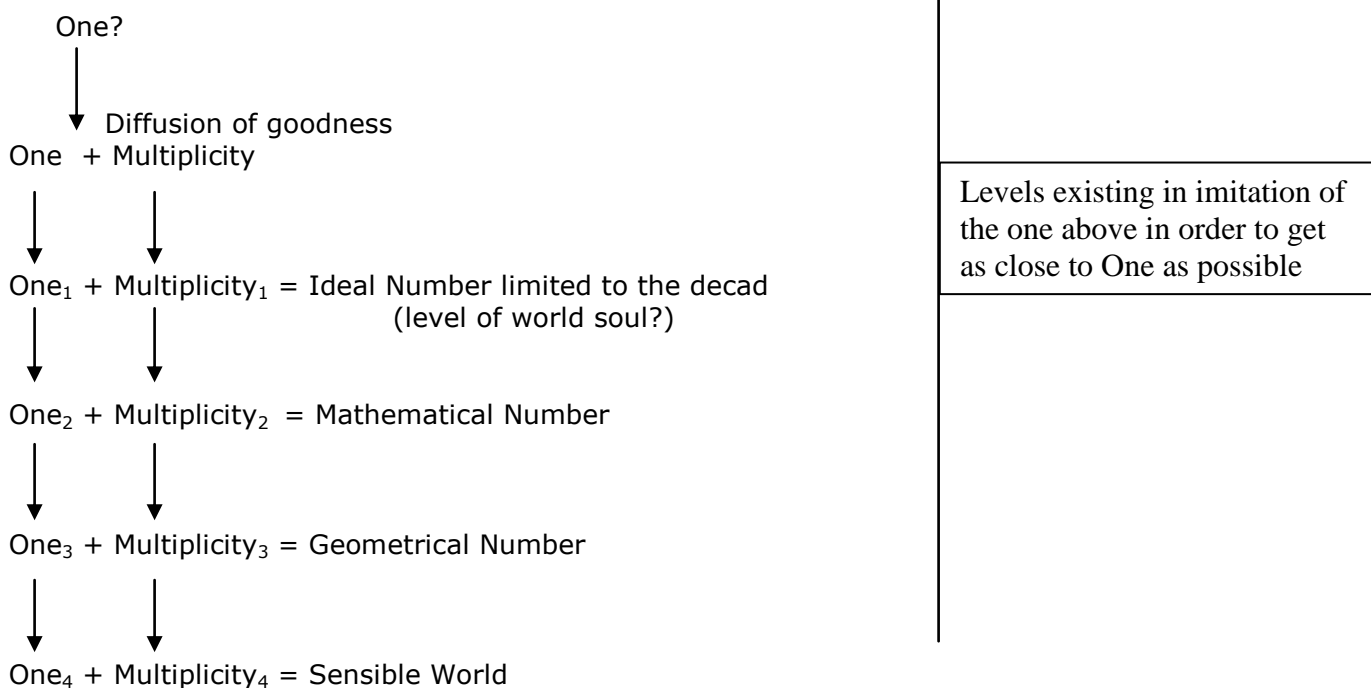
The lengthy exploration of Plato's ontology demonstrated that it is as impossible for a Platonist to discuss a material principle without explaining its corollary, the limiting or form giving principle, as it was for the Stoics. While the Platonists had a complex structure of hypostases of being the Stoics had only the sensible world. But this sensible world had the same two principle structure that was seen in the *Parmenides*, the *Philebus* and the Unwritten Doctrines relating to metaphysics. This two principled metaphysics was transferred, in the end at the expense of the naïve theory of forms, to physics by Plato. Plato's successors continued this two principle system in their metaphysics and by necessity into their physics. They made alterations in terms of the hypostatisation of their ontologies but the basic structure remained intact to be passed on to the Stoics.

Since the material principle of the sensible world was not of the first importance for the Platonists it is best understood by its relation to matter at the higher levels. The formal realm continued to be the realm which possessed most reality. The matter that corresponds to this realm is thus understood as matter most properly. It is the "out of which" for the things that are most properly said to exist. The matter that exists in the realm below this exists as matter analogously to the matter at the level above. Just as mathematical number exists in a resemblance to formal number so too its matter is a resemblance to the matter of the formal level. The matter of the highest level is clearly identified as an indefinite series in every Platonic system. The immediate result of the One and this Indefinite varies in the different philosophers. However the matter at the intermediate level seems to be a system of monads which

³⁷⁶ We have only a single fragment of Polemo's relating to metaphysics. If he was particularly interested in the subject it is reasonable to expect something more to have survived. Sedley's interpretation of Antiochus of Ascalon as teaching Polemonian physics will be discussed later in this Chapter.

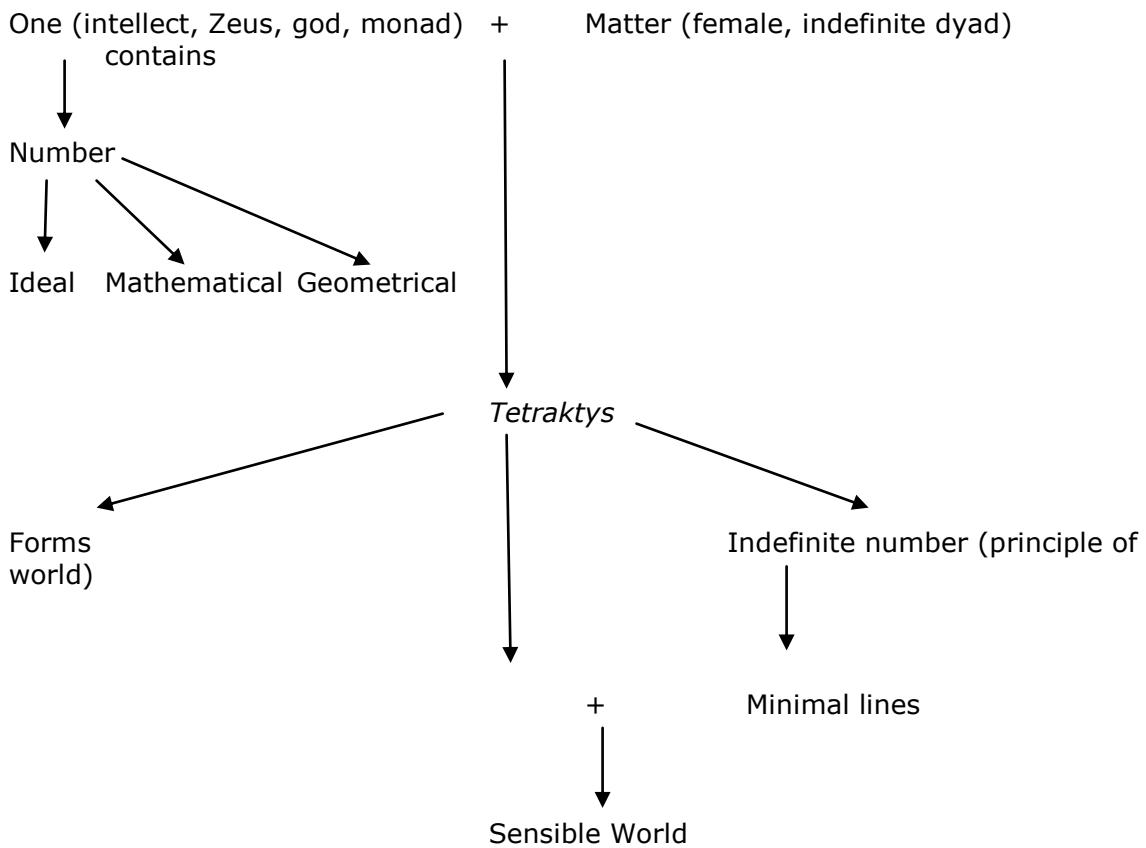
are then ordered according to the Ten Great Kinds of the realm above. The monads are grouped together in imitation of the forms or ideal numbers at the level above to create the mathematical numbers. The matter at the sensible level is again like the monads of the intermediate but exists as sensible points and these are collected again in resemblance of the mixture at the intermediate level. Having as their model the geometrical the resulting groupings of sensible points serve as the principles for bodies in the sensible world. The matter of the sensible world is thus most clearly understood as the lowest link in a chain of imitation or resemblance to the formal realm's matter. It is with this structure in mind - that sensible matter stands to geometrical matter as geometrical matter stands to mathematical matter as mathematical matter stands to formal matter - that this section of the thesis will progress. There will be a short discussion of the formal levels and their matters in the philosophical systems of Speusippus and Xenocrates, as this is "matter most pure" for them; followed by a discussion of the middle level and finally we will see how the sensible world's matter relates to the preceding matters.

Fig. 1. Speusippus' Metaphysics³⁷⁷:



³⁷⁷ This schematic representation of Speusippus' metaphysics will, I hope, clarify the basic notions that he employs; though, of course, any schematic representation of metaphysics is doomed to inadequacy. There is the issue of whether or not the mathematical and geometrical levels are actually inferior to the ideal as this diagram suggests. Plato mentions "ideal triangle" and this poses the potential problem that "triangle" exists below the ideal level. However I suggest that a possible explanation is that "what-it-is-to-be-triangle" is just ideal 3, so that "what-it-is-to-be-three" is essentially the same. See note 320.

Fig. 2. Xenocrates' Metaphysics³⁷⁸:



³⁷⁸ As with the figure above this representation of Xenocrates' metaphysics is doubtless inadequate. The removal of the *tetraktys* from the numbers in the Monad should be taken as figurative only, not as indicating some sort of separate existence.

3.3.1 Formal Level:

Plato had, quite clearly as we have seen, as his top principle the One. His two primary successors utilised this One in two different ways. Speusippus seems to have been more influenced in his ontology by the first hypothesis of the *Parmenides*. Speusippus' first One is, as a result, unknowable. Xenocrates' One is, on the other hand, much more interesting since it is available as an object of discourse. This is not indicative, as Guthrie would have us believe, of Xenocrates' "inferior intellect"³⁷⁹, but rather owes something to his attempt to reduce the complexity of the Platonic system.

Both Speusippus and Xenocrates were of the opinion that the creation myth of the *Timaeus* was a teaching aid³⁸⁰: a way of explaining the universe and the interaction of its parts for those of us who lack Plato's genius. The characters of the demiurge and world-soul will thus appear very differently in these two philosophers' schemes compared to the *Timaeus* itself. In Stoicism, it will be recalled from the first chapter, the roles of the demiurge and world-soul become conflated. The soul of the world, for the Stoics, is also the world's ordering principle and supreme cause. For Plato the forms remain separate mathematical paradigms that act as a model according to which the world is ordered. For the Stoics the forms as separable entities have disappeared. Instead the individual instances that exist at any given time in the world can be understood to take the place of the forms. The sensible world is formed by the thoughts of god; the Stoics created an impressive idealism mixed with materialism. The underlying questions for this part of the thesis then become: "What happened in the Academy in the years after Plato's death and the birth of Stoicism? How did the separate forms of Plato, and separate cause, become immanent in the sensible world? And above all: how much did the material principle of the sensible world actually change in the Old Academy and in its transference to the Stoics?"

When it comes to the philosophical system of Speusippus the answer to the first question is: not a lot happened. The whole scheme just becomes more convoluted. The One for him has certainly become even more transcendent than Plato's and one of Aristotle's main criticisms of him is that he multiplied principles beyond reason³⁸¹.

³⁷⁹ Guthrie, 1978 vol. v. pg. 474.

³⁸⁰ C.f. *De Caelo* I 10, 279b31.(=Fr. 54aLang/Fr. 61a Tarán/Fr. 94 IP).

³⁸¹ *Metaph.* 1028b21-23. (Fr. 33aLang/Fr. 29a Tarán/Fr. 48 IP. part)

Speusippus' ontology is extremely elaborate and, given that only fragments of his work survive, difficult to reconstruct and so I will not endeavour to give a full account of his whole theory, just those aspects relating to the previous section. His reason for removing the One from a discursive level and removing all qualities from it seems to be: that that which is a cause of something else having a particular quality cannot itself have that quality:

...supreme beauty and goodness are not in the beginning, because the beginnings both of plants and animals are explanatory factors whereas beauty and completeness are in what proceeds from those beginnings³⁸².

And:

Now, since it is equally impossible to exclude the good from first principles and to include it among them in the manner of these men, it is clear that there is something wrong in the way principles and the most primary beginnings have been conceived. No one has the right grasp on them who co-ordinates the universal principles with those of animals and plants, on the ground that the more complete always evolves from the indefinite and incomplete; the philosopher who declares such a doctrine about things primordial is forced to conclude that unity itself is not even something that is³⁸³.

Of this One clearly nothing can be asserted, else the whole point of positing such a One would be made redundant. How anything like this sort of One can be seen as a cause is difficult to understand. But such a problem arises most clearly if we are reading Speusippus' system as a temporal event. However there was no time when there was just this One and then something else came to be as a result of the One. Rather it is an explanatory principle: every chain of explanation must, to a Platonic mindset, lead back to some ultimate principle of explanation, whether this is the One, the Good or god. Speusippus' reason for taking the first hypothesis of the *Parmenides* as explanatorily relevant can, thus, be understood. But it is clear that as

³⁸² *Metaph.* 1072b30-1073a3. (Fr. 34aLang/Fr. 42a Tarán/Fr. 53 IP)

³⁸³ *Metaph.* 1092a11-16. (Fr. 34eLang/Fr. 43 Tarán/Fr. 57 IP)

far as a first principle goes this has no relevance to the Stoics. They have no need for such an explanatory principle either temporally, owing to their doctrine of eternal recurrence, or explanatorily, since they have god.

As we would expect this One has a correlating matter which is the indefinite of the Speusippean system; which he terms Multiplicity (*plēthos*). However, given that nothing can be predicated of the One it is unclear how such a One would relate to a material principle. Since there is no temporal creation, though, this may be the wrong perspective to take. Dillon points out in *The Heirs of Plato* that the problem with a monistic system, or ones in which differentiation between principles does not exist, is that from a single thing or undifferentiated cause no difference between creator and created is possible³⁸⁴: the One and Multiplicity may be propertyless in different ways; that is: nothing can be said of the One but everything can be said of Multiplicity reducing the meaningfulness of any assertion to nothing. It is unclear if this Multiplicity is derived, either temporally or timelessly from the One, or if it is simply inferior.

At the level below the transcendent One and Multiplicity Speusippus appears to have posited another One. This One also has a corresponding matter. However this One has properties of its own: things can be said of it. Dillon sees this One as acting back on one of its constituents: the original Multiplicity. Dillon says of the second One that it acts by: “mating, so to speak, in an incestuous union, with its mother (which Speusippus has been careful to characterize, as we have seen, as ‘a totally fluid and pliable matter³⁸⁵’).³⁸⁶” However there is no evidence for this “incestuous union” interpretation and there is no evidence that the One would act on *this* Multiplicity. However from a union with its matter somehow, we are not told how, the numbers are created. This One₁ is the cause of the formal numbers. It acts on some type of Multiplicity₁, which is most likely qualityless in a different way from the previous Multiplicity. It is perhaps better understood as analogous to the Indefinite of the *Philebus* when it would become an indefinite number series. That is, rather than being a generic undifferentiated Multiplicity of somethings – a “we know not what” – it is a Multiplicity of number. The reference to this Multiplicity as being a “fluid and pliable matter” should not be understood to indicate that it is like a plastic lump or a

³⁸⁴ Dillon 2005, pg. 46.

³⁸⁵ *DCMS* (p. 15, 5 ff. Festa) = (Fr. 72 IP part)

³⁸⁶ Dillon 2005, pg. 46.

lump of gold. Rather Speusippus, as reported by Iamblichus, is most likely just representing its qualityless nature in an analogy to matter at lower levels: it is no more indicative of Multiplicity's corporeal nature than the Gold Analogy of the *Timaeus* is. The matter of this formal level for Speusippus, as well as for Plato, is undifferentiated (that is infinite) number series³⁸⁷.

Xenocrates' philosophy is, in my mind, the crucial link between Plato and the early Stoics. The account of his heavily theological/mythological ontology that we have runs as follows:

Xenocrates, son of Agathenor, of Chalcedon, [holds] as gods the Monad and the Dyad, the former as male, having the role of father, reigning in the heavens, which he terms "Zeus" and "odd" and "intellect", which is for him the primary god; the other as female, in the manner of the Mother of the Gods, ruling over the realm below the heavens, who is for him the Soul of the Universe³⁸⁸. (Trans. Dillon)

We will come back to this passage throughout the discussion of Xenocrates but at present it is important to note what we are told about the active principle: the Monad. Contrary to both Plato and Speusippus, at any level³⁸⁹, we are given a great deal of information about the One: It is "male", "father", "reigning in the heavens", "Zeus", "intellect", and "odd". All these titles are fairly clearly related – "male", "father", "Zeus" and "odd" these are the traditional marks of the active principle throughout theological creation stories³⁹⁰. "Intellect" is no doubt best understood as the rational directing force of the active principle: the "Reason" of the *Timaeus*, and we will see its connection to sperm – the directing principle of life – in the last chapter. Locating the active force of the universe at the heavens is likewise understandable and should not, I think, be taken too seriously as a physical location for god; rather it is symbolic of his pan-universe rule. The Monad is, for Xenocrates

³⁸⁷ A fuller explanation of the relation of the matters at each level as well as the method of creation will be offered in the section below dealing with the sensible level of reality.

³⁸⁸ Aetius *Plac.* I 7, 30, p. 304 Diels = Fr. 15 H/213 IP. (part).

³⁸⁹ Plato's information about Ones is often so complicated that it is unclear what can be said of any of them.

³⁹⁰ Plutarch's explanation of Osiris as being etymologically derived from *os* –many and *iri* – eyed and hence the sphere of the heavens may also serve as explaining the connection of the epithet "reigning in the heavens" in connection with otherwise unrelated male epithets. CF. Plutarch *On Isis and Osiris* 355A.

most clearly of all the Platonists, the active and directing force of the universe. What is strange, and indicative of his reductive tendencies, is that this Monad is the first One. There is not even a hint that there may be a higher principle. Xenocrates has taken the first step in reducing the complex transcendent and abstract active principles of Plato and Speusippus to a more accessible understanding of it as god.

What is also clear from the passage is the reduction of the number of levels of reality. There is no mention of a "formal matter". The matter for the Monad is the female principle that is in the sub-lunar realm. The first active principle is not removed from the intermediate and sensible realms in the same way as in Plato or Speusippus. There is no formal level at the top existing independently, followed by the intermediate and then sensible. Instead the formal, intermediate and sensible aspects are all much more closely related. However they are still to be understood as analogous to each other rather than more intimately connected. While Plato and Speusippus have multiple active principles, one for each level, Xenocrates needs only the first active principle since it acts directly on a single matter creating all that there is. But the important thing to note in Xenocrates' philosophy is the reduction of hypostases: the fact that where there were three very separate levels of reality there are now only aspects to a single reality.

Speusippus has maintained and built on the abstract side of Plato's ontology: keeping his first One as a transcendent entity and leaving his second One₁ (and all subsequent) to be understood as number rather than as a theological entity or cause in a common sense way. Xenocrates, on the other hand, embraced, as we will see, both the mathematical and theological aspects of Plato's ontology. His One is god in a way that would be understandable with the minimal amount of explanation. His One clearly has a strong and "personal" relationship with the passive principle in a manner akin to that of the Stoic principles. The nature of number, the intermediate level of reality, will furnish us with more explanations of the direction the Academy was moving in.

3.3.2 Intermediate Levels:

In all of the Platonic systems looked at, Plato's, Speusippus', and Xenocrates', the union of the One and Dyad produces, in some sense, number. We saw in the first half of this Chapter that in Plato's system, as found in the *Parmenides*, the unlimited number stream that acts as the Dyad is a necessary product of the One³⁹¹. From the union of these two were yielded the ideal numbers which were found to be most likely identical to the decad. The mathematical numbers exist at the level below this and are comprised of monads grouped together under the image of the ideal number. It was suggested that these explain the "lower level" forms (those that are not the Five Great Kinds or, presumably, five other "Great", but unidentified, forms). The sensible world was still, as a result, constructed as an image of these mathematical objects which remained separate entities. The way in which number and forms are to be understood in Speusippus and Xenocrates will show us the adaptation of a material principle from these thinkers to the Stoics.

Speusippus kept the distance of forms and number from the sensible world as great as possible but Xenocrates, as we have begun to see already, did not. The characterisation of the forms as numerical objects continued in Speusippus whose reduction of forms to numbers clearly shows his focus is slightly different from that of his uncle. The decad for Speusippus, as for Plato and Xenocrates, held a special place of significance. This is attested to by Iamblichus in his *On the General Science of Mathematics* and in the pseudo-Iamblichean text *The Theology of Arithmetic*. For Speusippus the proper object for the Philosopher had become mathematical. The forms as abstract ideas had lost their privileged position. They had already begun to do so in Plato's late ontology as interpreted in the last section but he still shied away from reducing the understanding of forms to the understanding of number completely. For Plato mathematics was a tool to enable a Philosopher to access the truth. By studying mathematics a student was acclimatised to the idea of immutable and non-sensible objects of truth. For Speusippus on the other hand mathematical truth seems to have superseded knowledge of the forms *qua* traditional abstract entities.

³⁹¹ Not the transcendent One of hypothesis one but the One of the second hypothesis.

We know that Speusippus had a keen interest in mathematics as Iamblichus preserves a large section of Speusippus' *On Pythagorean Numbers* for us. The *Theology of Arithmetic* shows Speusippus as having a special place for the decad³⁹² but it is not clear if the decad itself is the first level of creation from the transcendent One and Multiplicity.

It would seem reasonable to suppose that the decad is in fact a level below the One. Aristotle has, after all, criticised Speusippus for multiplying principles³⁹³. Let us take the first One₁ as the principle of number which is then instantiated in the series of the decad by its limiting of a Multiplicity₁ that exists in imitation of the Multiplicity above. As Tarán points out³⁹⁴ Aristotle does seem to have been of the opinion that virtually all of his predecessors held creation to be from opposites, and clearly he classed Speusippus among this group with his One and Multiplicity. But if each principle is to consist of opposites is it not reasonable to suppose that the created One₁ must have a different "matter" to oppose it than the Multiplicity which is partially responsible for it? It is likely then that there is a separate Multiplicity₁ from the first Multiplicity and that it is this that is acted upon by the One₁ to create the decad. From the decad the same emanation will ensue so that mathematical number is created for the same reasons that Plato had.

All we can infer about the mathematical in Speusippus' scheme is that they are "many the same"³⁹⁵. They are addable and the type of number which we refer to when we say that $3+3=6$. If these cannot be 3s-in-themselves or the 6-itself it follows that the most likely candidate is that they are collections of monads grouped together under the class or image of 3 and 6.

Given the absence of the traditional forms but Speusippus' desire for knowledge to be attainable, though not through empirical work, and also the influence of the mathematical on the sensible, the decad is likely to be the highest object of knowledge and reachable only through intuition or union rather than dialectic. The

³⁹² *The Theology of Arithmetic* pg. 112. 83-86 = (Fr. 4 Lang/Fr. 28 Tarán/Fr. 122 IP)

³⁹³ *Metaph.* 1028b21-23. (Fr. 33aLang/Fr. 29a Tarán/Fr. 48 IP. part)

³⁹⁴ Tarán 1981, pg. 38.

³⁹⁵ Aristotle *Metaph.* 987b14-18 (Aristotle is here referring to Plato's system but there is no reason to suppose that Speusippus differed in this aspect); *Metaph.* 991b27-30 (Aristotle is again referring to Plato, but again there is no reason to suppose that Speusippus thought any different. Indeed if he had Aristotle would probably have mentioned it if just to make further fun of him).

mathematical numbers that we just noted the creation of are thus a stepping stone to this end of knowledge.

For any system that has reverence for the decad and places it in a privileged position the *tetraktys* is also special. Speusippus appears to appeal to a principle for geometrical entities which we will see later are of great importance for this discussion. According to Tarán's interpretation of Speusippus we would only know a line or triangular object when we came across one if we first had the idea of 1 or 3³⁹⁶. The monad, we are told by the author of the *Theology*, is the stable and perfect source of all number since it remains ever the same³⁹⁷. If mixed with larger numbers it is still a monad, if divided it is still a monad. The matters that exist at the level of ideal number and mathematical number are then of two types: the first would be analogous to the matter that constitutes the material element for the creation of the decad; that is: indefinite number or Multiplicity₁. The second type would be the indefinite collection of monads which are bound in resemblances of the formal number above, which are themselves resemblances of the original decad. These are formed from a One₂ which is an image of the One₁ and acts on a Multiplicity₂ which is also an image of the Multiplicity₁ from above. The limiting of Multiplicity₂ by One₂ creates the mixture that is mathematical number.

There are, then, at least two levels of number for Speusippus. But Aristotle also talks of geometrical number:

These thinkers, then, generate magnitudes from this kind of matter, but others [Speusippus] from the point – they regard the point as being, not one, but *like* the one – and another material principle which is *like* Multiplicity, but not Multiplicity; yet in the case of these principles nonetheless we get into the same difficulties. For if the matter is one, then line, plane, and solid will be the same; because the product of the same elements must be one and the same. If on the other hand there is more than one matter – one of the line, another of the plane, and another of the solid – either the kinds are associated with one another or they

³⁹⁶ *Op. Cit.* pg. 26.

³⁹⁷ Pg. 35.1. The author subscribes to the traditional etymology of *monas* from *menein* – to be stable.

are not. Thus the same result will follow in this case also; for either the plane will not contain a line, or it will be a line³⁹⁸.

We will have no idea of a line or plane unless we have the idea of two or three first; that much we saw above. It is at this point that Speusippus' metaphysics reaches its most complicated area and leads into the nature of matter. As such the discussion of physical number will have to wait until the next part. What has been shown is that the middle level of principles are held together by resemblance. The sensible world for Speusippus, as much as for Plato, is still an image of a separately existing paradigm far removed from it.

Mathematics and number furnish Speusippus with the tools for the middle level of reality, as it does for Plato, but we need more than just these for a full explanation of the intermediate level of reality. It is also at this level that the world soul exists – an entity not discussed in my analysis of Plato's metaphysics outside the *Timaeus*. Aetius informs us: "Speusippus [declares God to be] Intellect, which is not identical with the One or the Good, but has a nature peculiar to itself.³⁹⁹" Indeed god is not the One, since we know *the* One is transcendent. But nor is this transcendent One Good. It is possible that Aetius' account is confused owing to the complexity of the system which he is attempting to report. What seems most likely is that Aetius is not trying to tell us that Speusippus' god is the transcendent One, or that god exists at the level of the Good. God should not be at the level of the Good since for Speusippus the Good and Beauty and other such Forms exist only at a relatively low level. They are held to have no meaning at the higher levels. God, therefore, would perhaps exist at a level between these two. This would place him perhaps at the first level of offspring, the One₁ that is principle of the decad. We know other things about Speusippus' god and theology that will help explain the relationship of the active principle to the material. We know that he understood the image of creation in the *Timaeus* to be no more than a teaching aid⁴⁰⁰. Any talk of temporal creation was for explanatory purposes only and not to be taken as indicative of Plato's real meaning. We saw in the second chapter how such a reading of the *Timaeus* leads to a conflation of the demiurge and world-soul, and so such a conclusion is likely to have been reached by Speusippus. We also know that he called the world-soul: "the

³⁹⁸ *Metaph.* 1085a31-b4 (Fr. 48c/49 Lang/Fr. 51 Tarán/Fr. 84 IP)

³⁹⁹ Aetius (*Placita* I 7, 20 Diels = Fr. 38 Lang/Fr. 58 Tarán/Fr. 89 IP).

⁴⁰⁰ C.f. *De Caelo* I 10, 279b31.(=Fr. 54aLang/Fr. 61a Tarán/Fr. 94 IP).

form of the omni-dimensionally extended⁴⁰¹ (*idea tou pantēi diastatou*) and the omni-dimensionally extended is an imitation, ultimately, of ideal number.

Mathematics, previously the tool for the philosopher to get to something else, became, in Speusippus' philosophy, all pervading. The conclusions reached by Speusippus in regard to the matter of the sensible world will be seen to be largely the same as those reached by Plato; but we can see that he has approached the subject from a very different direction. Speusippus' emphasis on mathematics has maintained the separate nature of the paradigms from the sensible world as object of creation. In terms of active principle and middle principles Speusippus has not moved Platonism any closer to the Stoic position, but with his interest in, and emphasis on, mathematics as an end in itself this is not surprising. So far the only possible relationship that could exist between Speusippus and Stoicism is in the person of the world-soul, which he has not moved any further away from a Stoic position at least; and the material principle of the sensible world, but we will have to wait until the next section for an explanation of both and the relationship they have to each other.

Xenocrates' enterprise seems to have been almost entirely different from that of Speusippus'. While Speusippus was multiplying entities and maintaining a rigid and formalised hierarchy of being, Xenocrates was doing what he could to reduce the clutter of Platonic hypostatisation. The way in which he attempted to do this drew as much criticism from Aristotle as Speusippus' increased elaboration did⁴⁰².

Xenocrates' "middle level of reality" consists of, as we would expect, the world-soul and number: the same as his predecessors. Just as Plato was identifying forms with numbers and Speusippus was replacing forms with numbers so too did Xenocrates follow this tradition. In a sense Xenocrates can be seen as close to Plato on this issue:

He holds that the Forms and numbers have the same nature and that other things – lines and planes – are dependent upon them;

⁴⁰¹ Iamblichus *De Anima* (ap. Stob. *Ecl* I 363, 26-364, 7 Wachs. = Fr. 40 Lang/Fr. 54 Tarán/Fr. 96 IP)

⁴⁰² E.g. *Metaph.* 1080b21 (Fr. 34H/Fr. 108IP).

and so on down to the substance of the heavens and the sensible realm⁴⁰³.

However while I have interpreted Plato as identifying different forms at different levels of reality Xenocrates identified forms with mathematical number and placed them unambiguously in the world-soul. Mathematical numbers are not single things and so neither Plato nor Speusippus saw them as adequate candidates for knowledge of the sort that is the object of the Philosopher's search. The passage also tells us that numbers, whatever their state, are still the cause of the sensible world. Lines and planes are indeed ultimately dependent on number and form in Plato, why should they not be so in Xenocrates? Everything is dependent on number down to the very bottom of the sensible realm, so far nothing strange at all. But while Plato has a more rigid structure of the formal numbers, mathematical numbers and geometric numbers, Xenocrates appears to be classing all these under the general term "number". According to Aristotle this results in the absurdity that either formal number is done away with or mathematical number is done away with since they cannot exist together. According to Aristotle Xenocrates is trying to treat formal number as though it were mathematical number by saying that the form of Two can be added to the form of Three to make the form of Five:

Others [sc. Xenocrates], wishing to preserve both Forms and numbers, but not seeing how, if one posits these [sc. The Monad and the Dyad] as first principles, mathematical number can exist beside form-number, identified form-number with mathematical number – but only in theory, since in practice mathematical number is done away with, because the hypotheses which they propound are of a peculiar nature and not mathematical⁴⁰⁴.
(Trans. Dillon)

In fact what Xenocrates is doing is trying to remove the charges of absurdity that Aristotle levelled against Speusippus whom he thought was needlessly and unhelpfully multiplying levels of reality by having analogous principles at every level of reality. For Xenocrates the *tetraktys* will function as the foundation for numbers in their two guises, that of the mathematical and the geometrical. According to

⁴⁰³ *Metaph.* 1028b24. (Fr. 34 H/103 IP)

⁴⁰⁴ *Metaph.* 8, 1086a6-11 (Fr. 34 H/110 IP).

Aristotle this results in the absurdity that Xenocrates says formal numbers can be added, though Dillon has defended Xenocrates on this point⁴⁰⁵.

Favonius Eulogius, basing himself on the polymath Varro, asserts that all is number for Xenocrates: "Number is intellect and god; for there is nothing else but what is subject to number."⁴⁰⁶ We saw above, in the discussion of the formal levels, that Xenocrates called the Monad: "odd", a characteristic of number. However the One that is the active principle for Xenocrates is more properly understood as a principle of number rather than as number in general. Instead the idea of number in general is found in the world-soul:

The former [sc. Xenocrates and his followers] believe that nothing but the generation of number is signified by the mixture of the indivisible and divisible being, the One being indivisible and Multiplicity divisible, and Number being the product of these when the One bounds Multiplicity and imposes limit upon unlimitedness, which they also term the Indefinite Dyad⁴⁰⁷.
(Trans. Dillon)

Xenocrates "and his followers" thought of the world-soul as nothing other than: "number moving itself."⁴⁰⁸ The passage of the *Timaeus*⁴⁰⁹ explaining the creation of the world-soul was interpreted by Xenocrates in the following way: the indivisible being was the One and the being which is divided about bodies is the Dyad. The third form of being is that which comes out from these: the sum total of form numbers⁴¹⁰: The forms are not only reduced to mathematical principles but are also the content of the world-soul. The matter of the world-soul's thought is characterised as the dyad: the female principle of fragment 15. But this dyad is only indefinite in potential; it is in reality the "fountain of all number", i.e. the *tetraktys*. The creation is only a story; the mathematical numbers are from those constituting

⁴⁰⁵ Dillon, 2005, pg. 110.

⁴⁰⁶ Favonius Eulogius *Disputatio de Somnio Scipionis*. V 6, p. 17, 16 sqq. Van Weddingen (Fr. 16 H/214 IP).

⁴⁰⁷ Plutarch *On the Creation of the Soul in the Timaeus* 1012d-e.

⁴⁰⁸ Aristotle *De Anima* I 2, 404b27-8, (Fr. 60 H/165-87 IP), cf. Plutarch *On the Creation of the Soul in the Timaeus* 1012d-e ff (=Fr. 68H/188 IP).

⁴⁰⁹ *Timaeus* 35a.

⁴¹⁰ The fact that a Platonist with strong Pythagorean leanings identifies forms and numbers should not by now be a surprise.

the *tetraktys* which contain the decad and hence all later numbers⁴¹¹. While for Speusippus mathematical were collections of monads classed under resemblance to the formal 3 or 6 etc. the same cannot be the case for Xenocrates. Instead it seems most likely that they are still monads but that the classes that they form are somehow supposed to be permanent: so that a collection of 3 monads is 3 but added to a collection of 4 monads we have the number 7 since there are 7 monads but there are also all the possible ways of reaching the number 7 subsumed in that.

The world-soul in the *Timaeus* spends its time understanding the relationship of the world to the forms. In Xenocrates' system it is well placed to do this as the numbers which constitute its nature are the forms and are directly influencing the structure of the sensible world.

The picture that we have here resembles quite closely the idealism that we saw in the Stoic theory. While there is still a significant difference between the sensible world and that which it is modelled on the gap has been significantly reduced. Xenocrates is, after all, still a Platonist and so it is no surprise that immanent forms were anathema to him, unlike for the Stoics.

⁴¹¹ Further explanation of the nature of the dyad as the *tetraktys* will be given below.

3.3.3 The Sensible Level:

In all the Platonic systems that have been looked at we have seen the common theme of at least a one stage removal of the sensible world from the formal and mathematical realms. However in the last, Xenocrates', system the gap had closed to such an extent that forms were in the mind of god *qua* world-soul and identical with mathematical number. In their treatments of the material principle of the sensible world all three philosophers become much closer than their active principles made them appear. The cause of the corporeal nature was for Plato accidental but necessary; a by-product of the realisation of the elemental figures in the geometrical matrix of the sensible world. That the sensible world is sensible is necessary; and given that it exists as sensible and that Plato was disturbed by the changeability of the sensible it would be peculiar, to say the least, if he had a system whereby it was optional for his demiurge to make the sensible world sensible or not: if he had a choice then there could be no reason for a Platonist to make the sensible world sensible; there must be something necessary about it. It was this consideration that led to the conclusion that Plato's physics must be thought about from both a top down and bottom up approach. With both the sensible world necessary, since we experience it, and the formal world necessary, for we must have knowledge. There has to be an explanation that will meet in the middle: hence Plato's ultimate appeal to number as the mechanism by which both can be linked.

Speusippus, like Plato, has a material principle at each level but it is the material principle that is responsible for the sensible nature of the sensible world that is our main focus. We saw that Speusippus has a principle at each level and that there are three levels involving mathematics with each level's matter being analogous to the previous level's. The lowest of these levels is geometrical number.

It is this level which is responsible for the sensible nature of the world – just as it was for Plato. Each level of material is analogous but becomes further removed its predecessors the more we move away from the first One.

When the sensible world is discussed ambiguity creeps in. Aristotle's report gives us a brief account of Speusippus' physics:

These thinkers, then, generate magnitudes from this kind of matter, but others [Speusippus] from the point – they regard the point as being, not one, but *like* the one – and another material principle which is *like* Multiplicity, but not Multiplicity; yet in the case of these principles nonetheless we get into the same difficulties. For if the matter is one, then line, plane, and solid will be the same; because the product of the same elements must be one and the same⁴¹². (Trans. Dillon)

Point is indeed “like one” but not One. It is not a causative active principle like Ones at other levels. Nor is the Multiplicity₃ strictly like the Multiplicity which exists as matter at other levels. The highest Multiplicity was characterised by Iamblichus as a “pliable and fluid matter⁴¹³”. The language used here should not be taken to indicate that Speusippus is thinking of a corporeal material principle in the way that the Stoics or even Aristotle do. Instead the characterisation used by Iamblichus is only indicative of the Multiplicity’s characterlessness just as the Gold Analogy of the *Timaeus* is indicative of characterlessness and not of the Receptacle’s nature as *hylē* in the sense the Stoics understand. In the case of geometrical number the point is like the One because it not only has as its cause the number one, it is through a knowledge of one that we have knowledge of a point, but it is through the point that all the other geometrical figures are made. Just as mathematical number is made of a collection of monads subsumed under the “form” of a greater single number (e.g. the 5 itself), so too are geometrical figures made of collections of points subsumed under the numbers of the *tetraktys* – 1 the point, 2 the line, 3 the plane, 4 the solid.

The system of relations between the levels of reality seems to work along the following lines: the basic Multiplicity opposed to the One is bound by the One. The result is a new Multiplicity₁, a by-product of creation; that is, a sort of definite Multiplicity in that it is not as characterless as the previous Multiplicity. This Multiplicity₁ is the matter bound into the decad, which was the object of the creation of the first One on the first Multiplicity. The Multiplicity₂ which is created, again as a by-product, is once again a more definite type of Multiplicity. This is bound by formal number which was the object of creation of the previous level. This mathematical number which is constantly bound in imitation of the formal number which is

⁴¹² *Metaph.* 1085a31-b4 (Fr. 48c/49 Lang/Fr. 51 Tarán/Fr. 84 IP)

⁴¹³ *DCMS* (p. 15, 5 ff. Festa) = (Fr. 72 IP part)

constituted of the decad. This multiplicity₂ is quite definite: it is an infinite number of monads. These are bound in resemblance to the level above: the formal numbers. The by product of this is the geometrical level: a collection of geometrical points. These geometrical points are collected under the image of the mathematical numbers which were the object of creation at the level above. The geometrical points' being bound creates lines, then planes and finally solids. The sensible world is then created by the bounding of "physical points" in imitation of the geometrical level.

The Platonic join-the-dots made up of geometrical points has been repeated by Speusippus. By calling the world-soul the "form of the omni-dimensionally extended" he has reiterated the structure. The world-soul is constituted by the formal understanding of the geometrical nature of the world. In Speusippus' system, as in Plato's, the world-soul acts as the intermediary between the highest level of knowledge and the sensible world's instantiation of, or resemblance to, those paradigms. It is well placed to do this as we have seen Speusippus' characterisation of it as the "form of the omni-dimensionally extended". It is clearly the principle that controls the ordering of the geometrical points. At the higher levels the material principle has been limited by a limiting principle identified as the One. This relates to what was found in the *Philebus* about the indefinite being limited according to mathematical principles⁴¹⁴.

These were understood as mathematical tools – doubling, adding, etc. – while here they are more simply called the One which by its definiteness limits the indefiniteness of the number series. The point in the geometrical level can thus be thought of as being part of the matter of the sensible world while also being analogous to the Ones at the higher levels. From this we can see that the "matter" of the sensible world is not really a "fluid and pliable matter" in the sense of an amorphous body like wax, but, as it was for Plato, a system based on principles of mathematics. It is "fluid and pliable" in the sense that it is made of geometrical points which can have any arrangement whatsoever. What makes the sensible world sensible is the instantiation of the dimensions that make up the thoughts of the world-soul. These thoughts are what arrange the pre-existing geometrical points into

⁴¹⁴ 25a-b.

some sort of order. In theory the basic elemental shapes are reducible to planes and thence lines and finally to points, but doubtless such an event could not take place.

Xenocrates also utilised the idea of the sensible world consisting of geometrical points arranged in the semblance of the world-soul's thoughts. It is through the mathematical considerations of Xenocrates that I think the strongest connections of the Old Academy (and so Plato) with the Early Stoa can be seen. In particular the considerations that led Xenocrates to posit minimal lines, a consideration which Chrysippus will be seen to build on.

The cause of the sensible world's sensible nature will be seen to be largely the same for Xenocrates as it was for Plato and Speusippus. Xenocrates does not separate out the different levels of reality in the same way as Plato and Speusippus. Rather than have the One existing completely separately and apart from the sensible world he has his One identified with god and with the world-soul and so immanent in the world from the start. The material principle for this One, which for Plato and Speusippus was more important and "pure" than that of the sensible world which exists as a pale imitation of it, becomes instead the material principle of the sensible world. Xenocrates is moving closer to the Stoic position by reducing the levels of complexity. However he clearly failed to move as far to the Stoic position as Zeno would have liked: he was, after all, criticised by Zeno for having an immanent god who is located at the heavens but one that remains immaterial⁴¹⁵. God is still, for Xenocrates, a mathematical principle and not a corporeal entity.

Xenocrates' mythological account involves, as we saw above, the reduction of the forms and ideal numbers to mathematical number. Since all forms and numbers exist at this level then there need be only one cause. Let us look once again at what we are told by Aetius:

Xenocrates, son of Agathenor, of Chalcedon, [holds] as gods the Monad and the Dyad, the former as male, having the role of father, reigning in the heavens, which he terms "Zeus" and "odd" and "intellect", which is for him the primary god; the other as female, in the manner of the Mother of the Gods, ruling

⁴¹⁵ Cicero *Tusc. Disp.* I 10, 20; *Acad. Post.* 11, 39; *Acad. Pr.* 39, 124; Tertullian *De Anima.* 5, 1, p. 6 Waszink; Nemesius *De nat. Hom.* 30, P. G. XL, 541 (Fr. 66H) Fr. 67H/Fr. 199-203 IP.

over the realm below the heavens, who is for him the Soul of the Universe⁴¹⁶. (Trans. Dillon)

Dillon is surely right in his analysis when he says that a step is here missing and that it is not the Mother of the Gods which is the world-soul but rather that this role is taken over by another deity⁴¹⁷. The Mother of the Gods would be the material principle for both the world-soul and the world itself. Since there is only mathematical number which acts as the nature of the forms then this becomes a plausible solution. The forms become formulae made of the ten basic numbers, which do not exist separately from the rest. The Mother of the Gods is clearly the antithesis of the One and so must be the Indefinite Dyad. In one way its interaction with the One leaves us with the content of the world-soul: the world-soul being nothing other than the sum of its, immaterial, thought⁴¹⁸; in another it leaves us with the sensible world.

The passive principle of Xenocrates is called, according to Plutarch, by many names: Multiplicity, Unlimitedness, and Indefinite Dyad⁴¹⁹. These we have seen used by Plato and Speusippus already but Xenocrates' own personal term for it appears to have been "the Everflowing⁴²⁰". Dillon⁴²¹ sees this, and I see no reason to disagree, as reminiscent of the Pythagoreans and so also as indicative of the *tetraktys* – hence the reference to it as the fountain of number. Dillon⁴²² concludes that the numbers in the *tetraktys* are the thoughts of god: but not god *qua* world-soul. Instead he sees them as constituting the thoughts of god *qua* Monad. If Dillon is correct then the Monad is limiting matter according to itself and creating from this limiting the *tetraktys*. The limiting is achieved by the instantiation of the Monad's "thought" in the female principle: the unlimited becomes limited but being the *tetraktys* it remains potentially unlimited.

⁴¹⁶ Aetius *Plac.* I 7, 30, p. 304 Diels = Fr. 15 H/213 IP. (part).

⁴¹⁷ Dillon says Dike as she is sometimes identified with Athena in mythology and Athena is a likely candidate for the Forms as she sprang from the head of Zeus.

⁴¹⁸ The world-soul remains necessary for Xenocrates as the direct relation of the sensible world to the higher level would not be possible. The middle step, in this case played by the world-soul, is still necessary.

⁴¹⁹ *On the Creation of the Soul in the Timaeus* 1012d-1013b (=Fr. 68H/188IP).

⁴²⁰ Aetius *Plac.* I 3, 23, p. 288a Diels (=Fr. 28H/101IP).

⁴²¹ Dillon 2005, pg. 101.

⁴²² Dillon 2005, pg. 101-2.

The *tetraktys* is, as Dillon points out, the symbolisation of “the totality of number⁴²³”. The totality of mathematical number is indefinite.

Others [sc. Xenocrates], wishing to preserve both Forms and numbers, but not seeing how, if one posits these [sc. The Monad and the Dyad] as first principles, mathematical number can exist beside form-number, identified form-number with mathematical number – but only in theory, since in practice mathematical number is done away with, because the hypotheses which they propound are of a peculiar nature and not mathematical⁴²⁴.
(Trans. Dillon)

Since, as with Speusippus, any creation is allegorical there was never a time when the indefinite totality of number had to be limited by the Monad. The material principle becomes the *tetraktys* by being limited: the *tetraktys* can be called the Indefinite or Indeterminate since it is the source of all numbers as it contains in itself the decad⁴²⁵; it is the potential cause of the unlimited. In this guise it can perform its two roles: as source of the forms for the world-soul, and as the source of the corporeal nature of the sensible world.

The mechanism of how the *tetraktys* can function as the material for the sensible world will be by now familiar. As the principle of the point is one so the principle for the line is two, for the plane three and the solid four. These will then be arranged in imitation of the other “offspring” the forms as mathematical formulae. The system of Xenocrates is not only simpler, reducing the number of levels of reality, but akin to his predecessors. He maintains the dualistic structure of creation. In this way his creation account of the sensible world resembles the dualistic base the Stoics have. There is only one active principle for Xenocrates and that is his Monad. This Monad acts on the one material principle: the female principle. In one way it creates the forms/mathematical numbers but in the other it creates the sensible world. The role of the world-soul and its thoughts – the forms – is thus to act as a link between the active “pure” aspect of the world and the passive, sensible, aspect of the world. The world soul is that which makes the whole system rational. By reducing the

⁴²³ Dillon 2005, pg. 102.

⁴²⁴ *Metaph.* 1086a6-11 (Fr. 34 H/110 IP).

⁴²⁵ Since $1+2+3+4=10$.

complexity of the Platonic system Xenocrates has explained the necessity of the sensible world and kept the forms immanent but incorporeal.

While Xenocrates' predecessors seemed to have pictured the sensible world as being constructed by a three-dimensional-join-the-dots Xenocrates did not in exactly the same way. He posited, to Aristotle's amusement, a theory of minimal lines⁴²⁶. It is this theory of minimal lines that will form an important link to the Stoics in the way in which matter is supposed to exist. Xenocrates seems to have been concerned with the issue of how extension is supposed to be created from extensionless points. A collection of 0s is still 0. This consideration is most likely what led him to posit minimal lines. In a sense Xenocrates' concern is reasonable. Trying to build something up out of nothing is a trial doomed to failure. But do as the Stoics do and do not build up from nothing but try to reduce down to nothing and we can see that Xenocrates may have been unwise, though not unreasonable, to posit such a theory. Each geometrical point can be divided, but since it is extensionless each is still one, just as each $\frac{1}{2}$ or $\frac{1}{3}$ is still a monad at the mathematical level. It is because Xenocrates is building *up* the sensible world that he is appealing to indivisible lines. Each indivisible line in theory would still have to be reducible to points, since that is what it is to be a line: the connection between two points.

Xenocrates is not afraid to build on the atomistic implications of the *Timaeus*. This attitude has another interesting effect for the theory of the material principle of the sensible world. Plato's main concern with the sensible world is not that it is bad in itself but rather that it is inconsistent even with itself: what is true at one point is not true at another and this sort of "truth" is of no use at all. The consideration that the world was in flux is something that Aristotle tells us that Plato believed from his youth right through to his old age⁴²⁷. The idea that the sensible world's imperfection is in its inconstancy is far preferable to the idea that Plato simply had no time for it. Xenocrates makes great use of the idea that the sensible world is in flux in his explanation of harmony as Dillon makes clear:

⁴²⁶ Aetius *Plac.* I 13, 3 p. 312b Diels (=Fr. 51H/148IP), and I 17, 3, p. 315b Diels (Fr. 50H/151IP). Cf. Aristotle *Met.* 992a20 where he tells us that Plato: "called the indivisible lines the principle of lines". No doubt he does not mean to propose that Plato had physical indivisible lines, but if they were conceived of as existing at a higher level it is not then unreasonable for Xenocrates to have brought them down to the sensible level.

⁴²⁷ *Metaph.* 987a31-987b1.

In explaining the Pythagorean doctrine of harmonics, Xenocrates sets out, first, an analysis of types of motion, and then, when he has identified sound as a species of motion in a straight line, he presents it as consisting in fact of a sequence of sound-atoms, each occurring at a given instant, but giving the impression of a continuous flow. To illustrate this conception, he offers the interesting analogy of a spinning top with a single white or black spot on its surface, which, as the top spins, appears as a continuous line⁴²⁸.

This is taken by Dillon as indicative of a wider theory of perception and in this he is no doubt correct. But for our purpose it potentially shows how the world made of collections of geometrical points can be a three-dimensional reality. The spinning top must spin if the points are to be a continuous line. Likewise the sensible world must be in continuous flux if the minimal lines are not to “breakdown” to their constituent geometrical points: this would result in the collapse of the sensible world. In order to be knowable in the minimal way in which it is the sensible world must be in continuous motion by necessity, which ironically also stops it being knowable in a full sense.

The sensible world for Xenocrates can still be seen as an image of a separate and incorporeal paradigm since it is rendered rational by being understood through the forms: the thoughts of the world soul. But this paradigm has become much closer to the material of the sensible world than it was in either Plato or Speusippus. However Xenocrates did not make the final leap to a corporeal cause such as the Stoics did. His material principle became a single thing responsible for two aspects of reality; the first time that such a complex theory had been put forward. It may appear as though Xenocrates’ conception of the material of the sensible world is at odds with that of the Stoics. Xenocrates’ material principle for the sensible world is a mathematical and atomic structure as opposed to a continuum of three-dimensional extension with resistance. Indeed on the surface the difference is striking, his material principle is after all still incorporeal, but the implications of the Xenocratean

⁴²⁸ Dillon 2005, pg. 118. Based on Porphyry *In Ptol. Harm.*, p. 30,1 sqq. Düring (Fr. 9 H/87 IP). This is strongly reminiscent of the Heraclitean fragment 46 (B 125 = 31M): “The barley drink disintegrates if it is not stirred.”

theory are in fact much closer and he gave to the Stoics the way in which their material principle exists.

3.4 The Stoics:

Xenocrates is the last of the heads of the Old Academy to have had a major interest in physics and the first to have made such great innovations in this sphere. Since it is his, and not Polemo's, physics that have survived in greater detail we cannot know the extent of Polemo's interest in physics. Indeed the lack of reportage on Polemo's physics suggests that he was not particularly interested in physics. He was also said to have been a great admirer of Xenocrates and as we have seen Xenocrates' physics did not leave much for Polemo to do before Zeno.

It appears, if we take Diogenes Laertius' account seriously, that by Xenocrates' time as head of the Academy mathematics, and proficiency therein, would be a major part of what those entering would be expected to know and continue to study⁴²⁹. It is extremely likely then that Zeno would have been proficient in mathematics, especially since he was supposedly a merchant before he became a philosopher⁴³⁰. As a result of this background it is likely that the intense mathematical rigour of the Old Academy influenced and permeated the Stoa. Indeed Chrysippus is credited with various mathematical solutions to problems and it is to these that I will turn to demonstrate how mathematical considerations can be used to chart the understanding of the Stoic passive principle.

According to Plutarch Chrysippus had an answer to the Cone Paradox of Democritus:

Again, look how he countered Democritus, who in the vivid manner of a natural philosopher raised the following puzzle. If a cone were cut along a plane parallel to its base, what should we hold the surfaces of the segments to be, equal or unequal? For if they are unequal they will make the cone uneven, with many step-like indentations and rough edges. But if they are equal, the segments will be equal and the cone will turn out to have the properties of a cylinder, through consisting of equal, not unequal, circles, which is quite absurd. Well here Chrysippus declares

⁴²⁹ Diogenes Laertius relates an anecdote that Xenocrates turned away a potential pupil from the Academy as he had had no training in mathematics, music or geometry complaining that there was nothing in the student onto which philosophy could fasten itself. DL IV. 10-11.

⁴³⁰ DL VII. 2-3.

Democritus to be ignorant and says that the surfaces are neither equal nor unequal, while the bodies, thanks to the surfaces' being neither equal nor unequal, are unequal⁴³¹. (Trans. L&S)

Obviously Plutarch does not think much of Chrysippus' response but it is in fact remarkably ingenious. Chrysippus makes use of the idea of convergence on the infinite and the notion that limits, being only "sayables" and not real things⁴³², can have contradictory properties. While Xenocrates posited minimal lines these each had a definite, though no doubt unknown, minimal length. Chrysippus, as Sambursky points out⁴³³, has gone beyond this and posited a variable "atomic" length. In essence he created an "atomic continuum".

In his reply to the Cone Paradox Chrysippus says that the body will be unequal. This expresses again the convergence principle since the body, although bound by its limit, is not itself coterminous with those limits:

Let $A1 < A2 < A3$ be the surfaces of three adjacent sections. Chrysippus' assertion is that the volume defined by the surfaces $A1$ and $A2$ is not equal to that defined by $A2$ and $A3$, in spite of the relations $\lim (A3 - A2) = 0$ and $\lim (A2 - A1) = 0$ ⁴³⁴.

Discussion of limits is one thing, they do not properly exist. But matter clearly does. However if the same considerations that led Xenocrates to posit minimal lines, that the sensible world cannot be built up from nothing, apply to the Stoics then perhaps we can use the concept of convergence on the infinite in this way too.

Man does not consist of more parts than his finger, nor the cosmos of more parts than man. For the division of bodies goes on infinitely, and among the infinities there is no greater and smaller⁴³⁵. (Trans. L&S)

⁴³¹ Plutarch *On Common Conceptions* 1079e-f (=L&S 50c5-6).

⁴³² Proclus *On Euclid's Elements* I 89,15-18 (=L&S 50d = SVF 2.488, part).

⁴³³ Sambursky 1959, pg. 93.

⁴³⁴ Sambursky 1959, pg. 95.

⁴³⁵ Plutarch *On Common Conceptions* 1079a (=L&S 50c2-4).

The division of bodies goes on infinitely. It seems that Plutarch is ascribing to the Stoics the idea of a convergence on the infinite in terms of spatial extension which applies to sensible bodies and not just in terms of geometrical figures. Chrysippus is reported to have drawn a distinction between vague and definite answers to the question of how many parts a man consists. If someone asks how many parts a man consists of we can give two answers:

- 1) We can give the general reply that man consists of a head, trunk, two arms and two legs: "head, trunk and limbs – for that was all the question amounted to"⁴³⁶.
- 2) If the questioner demands a more specific answer and wants to know about the ultimate parts then we should: "not, he says, in reply concede any such things, but must say neither of what parts we consist, nor, likewise, of how many, either infinite or finite. I have, I think, quoted his actual words."⁴³⁷

There can be no answer to the second question because there are no actual "ultimate parts" if we continue to divide we will never stop. As the quote above shows: there is just as much "stuff", or matter, in a human finger as there is in the cosmos as a whole: because the quest to reach a definite number in either case will be an infinite one.

The cutting of a geometrical cone and a body may appear different but the considerations that apply are the same. If the limits on the cones are expressible as converging on the infinite so this must be logically consistent as mathematical considerations are essentially based on solely logical concerns. But is the division of a sensible body the same as the division of a geometrical body? Since the Stoics are continuum theorists then the division is in essence the same. Neither can actually be divided to an end since both consist of infinite parts. These considerations explain the way in which *apoiós ousia* is supposed to be understood in only one sense. In the most simplistic sense it is three-dimensional extension with resistance; a lump of malleable plastic as we saw Speusippus' Multiplicity characterised by Iamblichus. But this explains only one aspect of *apoiós ousia*: its characterless quality. Mathematical

⁴³⁶ Plutarch *On Common Conceptions* 1079b (=L&S 50c3 part)

⁴³⁷ *Op. Cit.* 1079b-c.

considerations explain how, in the manner of Plato⁴³⁸ and Speusippus, it is three-dimensional. Mathematics also explains in what sense it is a continuum and brings a new facet to the understanding of total blending, which we saw in the first chapter only applies to god and *apoiros ousia*.

These considerations apply to body in general; god, *apoiros ousia* and the synthesis of the two. But the truths that mathematics, and these concerns in particular, demonstrate will apply to *apoiros ousia* primarily: for if it applies to the others it does so only because they are body; and *apoiros ousia* is body *par excellence*. It will be remembered from the first chapter that the active principle is body in a rational disposition: a single thing. *Apoiros ousia* is body not disposed in any particular way. If the synthesis of the active and passive is understandable likewise as infinitely divisible then it is so only because it is *apoiros ousia* disposed by the active principle, and not because of something extra.

Following the tradition of his predecessors at the Academy Zeno is said to have had at least enough interest in the Pythagoreans to have written a book entitled *On Pythagorean Questions*⁴³⁹. According to Long and Sedley⁴⁴⁰ by the Hellenistic age mathematics and philosophy had become separate disciplines and mathematics no longer served as a paradigm case for the philosopher. While it is true to say that mathematics as it has appeared in this part of the present chapter was no longer a paradigmatic discipline for the Stoics it is also true to say that it still served an important purpose.

In his paper "The harmonics of Stoic virtue" Long shows that, in fact, the Stoics had a place for aspects of mathematics in directing the "good life". The Stoic universe is held together in perfect proportion with all its parts being in sympathy with one another – it is a perfect harmony. This situation can only really be best understood in terms of mathematics since harmonics is and was a branch of mathematics. Uttered language is for the Stoics "the natural expression of reason⁴⁴¹". The *Philebus* connected language and music and subsumed both under mathematics as the way to

⁴³⁸ Cf. *Timaeus* 32a-d.

⁴³⁹ DL VII 4-5.

⁴⁴⁰ L&S pg. 301.

⁴⁴¹ Long, 1991, pg. 205. It is also worth remembering that reason is, for the Stoics, a disposition or relational property of the Soul, a relation which would surely be understandable in terms of mathematics or harmony.

understand them. It seems plausible that the Stoics would follow this mindset and relate music to language and if music is part of harmonics and harmonics of mathematics then the connection between language and mathematics, although convoluted, is clear.

Long cites the interest the Stoics had in Heraclitus and his interest in conceiving of the world as held together in some sort of ratio or proportion. We know also that Heraclitus was not too impressed with Pythagoras and saw him as someone with much learning but not much use⁴⁴². It is possible that he had the same frustration with the Pythagoreans as Plato did: That they had a great system but failed to see to just what use it could be put. It is likely that the idea of cosmic harmony was taken from the Academy by the early Stoics and further justified by relating it to the great sage Heraclitus.

The best way to emphasise the interest of the Stoics in mathematics and hence a connection to the physics of the Old Academy would be to look for a role for the *tetraktys* in Stoicism. The *tetraktys*, we have seen, has played a very strong role in the philosophies of all three of the Platonists discussed, going so far as to be the theoretical principle of the sensible world; a theory which must have been of interest to the Stoics. However they seem to have had little, if indeed anything, to say expressly about the *tetraktys qua tetraktys*. Given the removal of mathematics from its privileged position over the sensible world that is not surprising. The first chapter showed that the forms of the Platonists had been reduced to the thoughts of the active principle instantiated through *apoiros ousia*, in a manner reminiscent of the aim of Xenocrates, but not eliminated. That we are all subsumed under the "idea" of man means no more than that we are many varieties of a species, instantiated by god as he thinks of us. So there is man, and here is man and all over the place is man, but there is no "man" over and above all the instantiations. This is something that should not be possible for a form proper but looks like a criticism that Aristotle would lay against Xenocrates' identification of the forms with mathematical number. With the reduction to immanence of both number and form, when form is just *apoiros ousia* held together according to a ratio dictated by harmony according to god in his infinite wisdom, the Stoics need no longer give the *tetraktys* such a privileged position. If

⁴⁴² Fr. 40: "The learning of many things does not teach understanding, else it would have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus." More in depth discussion of Heraclitus will form the subject matter for the next chapter.

Xenocrates began the reduction of ontological levels the Stoics finished it. The result of this is, as we have seen in the first chapter, a type of material Idealism.

However old habits are difficult to break and if we look hard enough we can see some remnants of the importance of the mystical *tetraktys*. There are four cardinal passions: pleasure, distress, appetite and fear. These four passions were referred to by Aristo, an associate of Zeno's, as the "Tetrachord"⁴⁴³. This is a musical term which expresses a concept central to all Greek music, which again reinforces the mathematical heritage of the Stoics. The virtuous man contains all the virtues - again four in number: prudence, moderation, courage and justness. The standard description of this state of affairs in Stoicism is to say: "they contain all the numbers of virtue"⁴⁴⁴. That sounds quite Pythagorean, especially when we recall that 4 is the number of justice⁴⁴⁵, and that 10 is the number of the whole and complete⁴⁴⁶. The sum of the *tetraktys* is 10 and the reference could be to something so oblique as that the virtuous man has the sum of the *tetraktys* in proportion and so can be called the decad owing to his completeness. This is pure speculation but has an air of plausibility to it. This is a little more esoteric than Long's suggestion that "all the numbers" simply somehow represents the four cardinal virtues and their subsets which gives rise to a definite number, but is not unreasonable for all that. The cardinal virtues, and passions, can only be, since they must be bodies, different tensions in the *pneuma* and this can readily be understood as harmonies lending more credence to a mathematical interpretation. We also find in Stoicism four "categories", perhaps another reminder of the Stoics' Platonic heritage⁴⁴⁷.

The Stoics had an interest in mathematics. It was not the same intense insistence on its ability to explain everything in the world that the Old Academy had but had reverted back to being a tool. In relation to *apoiós ousía* it helps us understand how such a passive three-dimensional body works and exists. Unformed substance it indeed is, but it is also the material which is a necessary condition for the existence of the sensible world. The active principle needs something to act on and its relation to the passive is best explained through mathematics and the method of Xenocrates

⁴⁴³ Clement. Alex. *Strom.* II.20.108.I (=SVF 1.370). Notwithstanding his indifference to physics – DL VII 160.

⁴⁴⁴ Cicero *Fin.* III.24 (=L&S 64h).

⁴⁴⁵ Cf. *Theology of Arithmetic* pg. 63.29 Waterfield.

⁴⁴⁶ Cf. *Theology of Arithmetic* pg. 112.83-86 Waterfield (=Fr.4 Lang/Fr. 28 Tarán/Fr. 122IP)

⁴⁴⁷ Cf. Plutarch *On Common Conceptions* (=L&S 28a6-7 part): "I am simplifying their account, since it is four substrates that they attribute to each of us; or rather they make each of us four."

elaborated by Chrysippus into a theory of a substance whose parts are always converging on the infinite.

The theory of convergence on the infinite also helps explain the mechanisms of the Stoic theory of total blending which was seen to only apply to god and the passive principle. In the constant division of parts the isolation of the ingredients would become impossible, which given that one of these ingredients is devoid of all qualities is what we should expect. We saw also in the first chapter how the Stoics used a geometrical understanding of body to characterise their *apóios ousia*, it follows that the best way to understand it would be through geometrical language: and hence through the legacy of the Old Academy.

3.5 Polemo:

I have left the discussion of Polemo to the end of this chapter because, although he was Zeno's teacher at the Academy, I have argued that it was from Xenocrates that the real influence on Stoic physics came. After all it is claimed by Aetius that Xenocrates passed at least the characterisation of elements as god to the Stoics⁴⁴⁸ so they were likely aware of his metaphysics and so also of his physics. Dillon has spent considerable time reconstructing Xenocrates' physics from his fragments and the contemporary accounts of Aristotle. I too have attempted a brief account of Xenocrates' physics as it relates to the subject of this thesis. Such enterprises are possible because we have at least some evidence for what Xenocrates thought and the environment that his education took place in. Polemo, on the other hand, has left us with no evidence either from his own hand or from contemporary accounts. His known works do not include anything relating to either mathematics, though he must have been proficient to have been in the Academy, or physics. Instead his primary interest seems to have been in ethics. There is undoubtedly a strong influence on the Stoics in the field of ethics but it is unwarranted to move from an influence in this field to influence in one for which we have no evidence to suggest that Polemo was even interested in. Further, given my interpretation of Xenocrates' physics there would be little left for Polemo to do to close the gap. Indeed if he did close the gap at all it can only really be to have created Stoic physics, and if he did this as well as influence so strongly Stoic ethics we must ask why the Stoics left so sympathetic an Academy or else why Polemo was not forced out before Zeno's arrival.

Despite the lack of evidence both Sedley⁴⁴⁹ and Dillon⁴⁵⁰ have attempted to reconstruct Polemo's physics. The result is a physics that so strongly resembles Stoicism that there is no way to know which aspects are actually Polemo and which are Stoic innovation. Sedley took as the basis of his interpretation the account of physics offered by Varro in Cicero's *Academica* I 24-9. On the basis of this Sedley argued that the Stoic god could in fact be seen to have his origin in Polemo. Given that the only fragment we unambiguously have from Polemo regarding this topic is that: "the cosmos is god", this does not seem unreasonable. However there is no

⁴⁴⁸ Fr. 15H/213 IP.

⁴⁴⁹ Sedley 2002.

⁴⁵⁰ Dillon 2005.

reason to suppose that Polemo in particular is the influence of paramount importance since the non-literal readings of the *Timaeus* led both Speusippus and Xenocrates to conclude pretty much the same thing. Xenocrates in particular has an immanent world-soul which is responsible for the ordering of the sensible world in a way that is clearly much closer to the Stoic account than the vague statement that the cosmos is god. The only other support I can see for Polemo's having regarded god as corporeal in particular is that Zeno is said to have criticised Xenocrates for having an immanent but *incorporeal* god⁴⁵¹. If Polemo also had an immanent incorporeal god it would make sense for Zeno to criticise him too. But negative evidence is not a strong basis to build an argument on.

Instead I will look at the arguments of Dillon and Sedley that lead them to conclude that Polemo's physics is essentially the same as Stoic physics. By showing that although it is a plausible interpretation it is unnecessary I hope to be able to safely conclude that Xenocrates is the most important connection for Stoicism to the Old Academy and Plato.

Sedley basis part of his reasons for his search of Polemo's physics on the words of Theophrastus:

But Theophrastus, having first given a historical account of the others, adds: "These were followed by Plato, who preceded them in reputation and ability, although chronologically he was later. He devoted the greater part of his work to first philosophy, but also paid attention to appearances, trying his hand at physical inquiry. In this inquiry he wants to make the principles two in number: one which underlies, in the role of matter, which he calls "all receiving", the other in the role of cause and mover, which he connects with the power of god and with that of the good⁴⁵².
(Trans. Sedley)

The interpretation of Plato that I have offered in the first part of this chapter is indeed strongly metaphysical and it is through analogy that it relates to physics. But

⁴⁵¹ Cicero *Acad. Pr.* 39; Fr. 67H/Fr. 200 IP states that Xenocrates held the mind to be incorporeal and it is reasonable to see this as analagous to god.

⁴⁵² Fr. 230 FHS&G (Simplicius, *in Phys.* 26.7-15).

it was supposed that Plato's metaphysics and his physics are strongly linked since his metaphysics is a reaction to his concerns regarding physical phenomena. Theophrastus appears to be relying, in this passage, on the *Timaeus* for his interpretation and also to be accepting a non-literal reading and ignoring the implications of the metaphysical teachings. It is unlikely that this two principle system of physics has its origins in Polemo since Theophrastus was roughly contemporary with him, a little older, and would not ascribe to Plato the opinions of Polemo. Sedley is happy to accept that Theophrastus is offering a standard Aristotelian interpretation of Platonic physics and that it is based on the *Timaeus*. What bothers him though is the absence of forms. There should be three principles in the Platonic system⁴⁵³. It is also the case that Theophrastus seems to be basing his dualistic interpretation on the *Timaeus* explicitly and so Sedley thinks that there should be some independent justification for the authority of this view⁴⁵⁴, i.e. that the Old Academy furnished this interpretation. Sedley does not believe that the dualistic interpretation resembles either the physics of Speusippus or Xenocrates sufficiently and so it must be based on Polemo.

Sedley sees the account of Antiochean physics offered in Cicero's *Academica* as representative of physics at the time of Polemo and the direct predecessor of Stoic physics with their strong physical dualism. The passage from the *Academica* runs as follows:

The topic of Nature, which they treated next, they approached by dividing it into two principles, the one the creative, the other at this one's disposal, as it were, out of which something might be created. In the creative one they deemed that there inhered power, in the one acted upon, a sort of "matter"; yet they held that each of the two inhered in the other, for neither would matter have been able to cohere if it were not held together by any power, nor yet would power without some matter (for nothing exists without it being necessarily somewhere). But that which is the product of both they called "body", and, so to speak, a sort of "quality"...

⁴⁵³ In Physics according to a traditional interpretation we should have matter, god and the forms. It is the forms whose absence could be regarded as problematic.

⁴⁵⁴ Sedley 2002, pg. 45.

But they hold that underlying all things is a substance called "matter", entirely formless and devoid of all "quality", and that out of it all things have been formed and produced, so that this matter can in its totality receive all things and undergo every sort of transformation throughout every part of it, and in fact even suffer dissolution – not into nothing, but into its own parts, which are capable of infinite section and division, since there exists nothing whatever in the nature of things that is an absolute minimum, so as to be incapable of division; but that all things that are in motion move by means of "interspaces", these likewise being infinitely divisible; and since the force that we have called "quality" moves in this manner and since it thus travels back and forth, they think that the whole of matter also undergoes complete change throughout, and that thus these things are produced which they call *qualia* – from which latter, in a nature which as a whole coheres and forms a continuum with itself, there has been produced a single world, outside of which there is no portion of matter and no body, while all the things in the world are parts of it, held together by a sentient nature, in which inheres perfect reason, and which is also eternal, since nothing stronger exists to cause it to perish; and this force they say is the soul of the world, and it is also perfect intelligence and wisdom, which they call "god", and is a sort of providence, presiding over all the things that fall under its control, governing especially the heavenly bodies, and then those things on earth that concern mankind. This force they also sometimes call "necessity", because nothing can happen otherwise that has been ordained by it under, as it were, a "fated and unchangeable concatenation of everlasting order" – although they sometimes also call it "fortune" because many of its operations are unforeseen and unexpected by us on account of their obscurity and our ignorance of causes⁴⁵⁵. (Trans. Dillon. With omissions)

⁴⁵⁵ Cicero *Academica* I. 24-29.

As Dillon⁴⁵⁶ points out in his treatment of the passage the identification of the active principle with the world-soul, which resides in the heavens and permeates the universe, is not new in the Old Academy. Xenocrates' world-soul was said to permeate the whole universe and in my interpretation was the cause in the sensible world. His Monad, moreover, was stated to reside in the heavens. It is clear that this way of reading the *Timaeus* preceded Polemo, starting at least with his teacher Xenocrates. This active principle is not, as again Dillon points out, identified with fire as it is for the Stoics nor is it corporeal. Sedley's main concern is over the strength of the fate expounded in the passage. The doctrine is indeed strong here, and Stoic sounding. Dillon agrees that Antiochus need not be giving a pure account of Polemo's physics and can be forgiven for incorporating aspects of Stoicism into it. This idea, that Antiochus is not offering us either an account solely of Polemo or the Stoics I agree with. On the other hand I agree with it because I think Antiochus is doing what he has long been thought to have been doing which is taking aspects of Stoicism and mixing them with earlier philosophy⁴⁵⁷. My interpretation leads me to conclude that he is mixing Stoicism with the views of Xenocrates, not of Polemo. Dillon is more cautious than Sedley and accepts that the doctrine of fate as it appears here could be an aspect of Xenocrates' philosophy representing not a force that is in competition with god but the necessary nature of the Sensible World.

The passage from the *Academica* is undoubtedly a fascinating and useful tool for understanding the shift occurring in physical philosophy at the time of Antiochus. However there is little reason to see this passage as representing Polemo in particular, since we know so little of his actual views in this area. If, on the other hand, the passage did represent the views of Polemo accurately then we would have to ask what work would there have been left for Zeno to do? The answer is not a lot. The active principle in the account is not called fire, but that could be as little a difference as a terminological one since the "fire" that is the active principle is for the Stoics different from fire as commonly understood. Indeed the fact that the two principles are said to "inhere in one another" could be taken to imply the Stoic theory of total blending which only makes sense, as I argued in the first chapter, if it

⁴⁵⁶ Dillon 2005, pp. 171-174.

⁴⁵⁷ Reid 1885, Dorrie *Der Platonismus in der Antike* I, Stuttgart/Bad Cannstatt 1987, 472-7, Gorler "Antiochos von Askalon über die "Alten" und über die Stoa. Beobachtungen zu Cicero, *Academica posteriores* I 24-43", in P. Steinmetz (ed.), *Beiträge zur hellenistischen Literatur und ihrer Rezeption in Rom*, Stuttgart 1990, 1994 949-51. Levy *Cicero Academicus*, Rome 1992 552-6. Glucker "Socrates in the Academic Books and other Ciceronian Works", in Inwood/Mansfield. 1997, 86, Reydams-Schils 1999, 128-32, Kramer *Platonismus und hellenistische Philosophie*, Berlin 1971 11, n. 6.

applies to the two principles as three-dimensional with extension which is just too Stoic sounding to belong to any other school. Moreover the active is said in the passage to “travel back and forth”. This strongly resembles the motion of the active in Stoicism⁴⁵⁸. If all of these factors were in fact part of the physics of Polemo and since he influenced Stoic ethics so much Zeno would have had nothing to do and would have had no reason to call himself other than a Platonist in distinction to the sceptics at the Academy. These aspects in the passage that resemble Stoicism so much have to be, as a result, Stoicism read with a Platonic eye. Antiochus is taking those aspects of Stoic physics which improve on Xenocrates and blending the two, leaving out the potentially difficult aspects such as a fiery nature for god and his unambiguous corporeality.

If Polemo is not the final link in the chain from Plato to the Stoics, since Xenocrates is, then what is his role? Rather than as an innovator his lack of interest in physics makes it more likely that he influenced Zeno by teaching him the physics of his teacher: Xenocrates. There is no evidence, and so no reason to suppose, that Polemo reformed or altered greatly the physics of Xenocrates. He is the only one of Zeno’s teachers likely to have taught him any physics at all⁴⁵⁹, and if he was not teaching him his own physics then it is only reasonable to suppose that he taught Zeno the physics of Xenocrates whom we are told he greatly admired⁴⁶⁰.

We have seen how the Old Academy, and Xenocrates in particular, was responsible for the reduction in the number of separate levels of reality. Xenocrates reduced metaphysics to an aspect of the sensible world, with physics being another. His considerations of minimal lines also influenced the Stoics in their considerations of how the material principle was to be explained, though its functionality was nevertheless understood more in terms of a lump of plastic than as a mathematical entity. The next chapter will look at the pedigree of such a material principle and examine the influence of the man whom the Stoics themselves credited with the creation of much of their philosophy: Heraclitus the Obscure.

⁴⁵⁸ E.g. Galen *On Natural Faculties* 106, 13-17 (=L&S 47E = SVF 2.4.06); Alexander *On Mixture* 224, 14-17, 23-6 (=L&S 47I = SVF 2.442, part); Nemesius 70, 6 – 71,4 (=L&S 47J).

⁴⁵⁹ It is unlikely that either Crates or Stilpo would have taught much in the way of a metaphysical physics.

⁴⁶⁰ E.g. “It would seem that in all respects Polemo emulated Xenocrates” DL IV. 19-20.

Chapter 4:

4.1 Intellectual Climate of the Time.

The first part of this chapter will look at the Stoics' claim that their true philosophical antecedent is not Plato or the Old Academy but Heraclitus. This claim does not conflict as strongly with the one that I have been making throughout this thesis - that the origin of the Stoic material principle is to be found in the mathematical considerations of the Platonists - as it may at first appear to. There are several reasons for taking the claim seriously and examining its place in the picture that I have been exploring. Firstly it is a claim that the Stoics themselves make and who, if not the Stoics themselves, would know why they thought what they thought? Secondly even if the Stoics misinterpret the teachings of Heraclitus or overstate his direct influence on them he was in fact influential on the Stoics' ultimate predecessors: Socrates and Plato, and so could well have an indirect influence on them. However, the full relationship of Heraclitus to Socrates and Plato is beyond the scope of this thesis. Finally, although the Stoics are most likely actually claiming Heraclitus as their own having already formed their philosophical conclusions they do not draw unreasonable connections between his and their theories, and so he may convincingly be considered to be their spiritual predecessor if not their actual one⁴⁶¹.

The second half will look at the impact of the cultural and biological theories that form the background of the intellectual climate that the Stoics were working and developing their theories in. The early cosmogonic myths are replete with male and female imagery and we will see how the Stoics were not isolated in using such imagery to clarify their cosmological theory. The Derveni papyrus and the *Phaedrus* both indicate that the interpretation of archaic myth in the language of natural philosophy was prevalent in intellectual circles. The Stoic notion of the active and passive principles is mirrored in both early myth and medical imagery and it is this connection that will be looked at. It is doubtful that any of these background considerations had a decisive influence on the direction of thought of the Stoics; however it is important to see the use of imagery and general understanding that serves to form the background of the intellectual climate of the Hellenistic era.

⁴⁶¹ Kahn (1979) certainly sees the Stoics as the true Heracliteans of antiquity. Cf. pg. 5.

4.1.1 Heraclitus:

Heraclitus' place in the history of philosophy is a peculiar one. None of his writings survive and there is even some dispute over whether or not there was a single book in the first place for followers to call on⁴⁶². He was also not a teacher in the conventional sense and does not seem to have had a school or even actively taught to a group or individuals. As a result the words of his followers lack the force of those who could claim to have been actual disciples of antiquity's great thinkers⁴⁶³. Owing to space and the topic of this thesis I will avoid the complicated discussion over the accuracy or authenticity of the fragments that we have of Heraclitus and trust in the reportage of Aristotle, Theophrastus and the Church Fathers⁴⁶⁴. Before any relation to the Stoics will be examined I will take a little time to place Heraclitus in his appropriate position in the history of philosophy before the creation of Stoicism so that any appeal to him will have a clearer context.

If we may trust the report of Diogenes Laertius, and there seems to be no special reason not to, then we can conclude that everyone's sage of choice, Socrates, was an admirer of Heraclitus: "What I understand I like, and I think that what I don't understand is good too, but it would take a Delian diver to get to the bottom of it."⁴⁶⁵ That Socrates was a fan of the abrasive Heraclitus is easy to believe. Both clearly had a talent for, and got enjoyment from, cutting the pretentious down to size. Heraclitus' targets were the acknowledged wise men of the day: Hecataeus, Hesiod, Pythagoras and Xenophanes⁴⁶⁶. Socrates' were those who thought they were wise and wanted to convince others of this fact too. Anyone who valued Socrates' opinion, which probably includes the entire educated community of the ancient Greek world, would have to look at Heraclitus with at least grudging respect. It seems clear that Plato too was aware of the philosophy of Heraclitus and made use of it in developing his own thoughts: especially in regard to epistemology but with an impact on his

⁴⁶² Diels suggested that the fragments are fragments because they were inspirations and not meant to be part of a larger literary work. DL IX.5-6 states: "As to the work which passes as his, it is a continuous treatise *On Nature*." Diogenes does not seem convinced as to the authenticity of the book and the title *On Nature* is so generic that it would be the first title to enter into one's head if a title for an ancient book were required. KRS (1983 pg. 184) think it likely that Diogenes Laertius was working from a "collection of sayings, probably made in Alexandria, which followed a Stoic analysis of the parts of the philosophy".

⁴⁶³ Cf. DL IX.6. "So great fame did his book win that a sect was founded and called the Heracliteans, after him." Kahn (1979, pg. 3) calls him "a loner among a gregarious race".

⁴⁶⁴ Clement, Hippolytus and Origen. Theophrastus discussed Heraclitus, albeit briefly, in his *The Opinions of the Natural Philosophers*.

⁴⁶⁵ DL II.22 Trans. Hicks

⁴⁶⁶ E.g. DL IX.1. = (Fr. 40 D = 16 M = 18 K).

physics⁴⁶⁷, and we have also seen Xenocrates making use of the ideas of flux. Aristotle states clearly that Plato was not only aware of the teachings of Heraclitus but also that he believed them to be true from his youth to his old age⁴⁶⁸. The doctrine of Heraclitus' that Aristotle is referring to is indeed the most famous Heraclitean one that Plato uses in the *Theaetetus* for his own ends: that of the theory of flux. This is probably the most well known of Heraclitus' theories: that the world is continuously changing. To what extent he held this to be true we cannot be entirely sure but its general sense is enough to understand its appeal to Plato⁴⁶⁹. For Plato if knowledge is possible then it must be of unchanging objects since knowledge is always of what is true. If the objects in the sensible world are always changing then they cannot be the objects of knowledge so there must be true unchanging objects which differ substantially from those in the sensible world⁴⁷⁰. Note that neither Heraclitus nor Plato deny the existence of the sensible world, nor does either necessarily accept that the sensible world is bad. Xenocrates, we saw in the preceding chapter, could make use of the same argument to explain the very existence of the sensible world: it has to move and change continuously - if it stopped it would cease to be. Continuous motion ensures the integrity of minimal lines which in turn ensure the integrity of minimal surfaces and so solids⁴⁷¹. No motion would result in no world which, owing to the necessary existence of geometrical points because of the necessary emanations from the One, would be an impossible scenario⁴⁷². For Heraclitus constant motion or "War" is absolutely vital to existence and is, as such, a positive thing⁴⁷³. Even if the Stoics over-emphasise their reliance on, or pedigree from, Heraclitus they are not being entirely disingenuous. Aspects of Heraclitus' thought did indeed come through to them if only indirectly and play a role in the development of their material principle.

⁴⁶⁷ In that the sensible world is in flux for epistemological reasons and the physics has to fit in with this account.

⁴⁶⁸ *Metaph.* 987a33.

⁴⁶⁹ Allegedly the Heraclitean Cratylus took the theory to extremes commenting that one cannot even step into the same river once whereas his master permitted it once but not twice. Cf. Aristotle *Metaph.* 1010a11.

⁴⁷⁰ To very briefly summarise some of the concerns of the *Theaetetus*. For an interesting discussion of the depth of influence of Heraclitus on the creation of the theory of Forms see Irwin 1977.

⁴⁷¹ See chapter 3.3.3 pg. 169 note. 468 and note for the connection between Xenocrates' epistemology and Heraclitus' constant motion.

⁴⁷² Dillon, 1996, pg. 28, argues that the Line is still produced by the Point acting on the Long and Short. There may be indivisible lines but their tacit principle is still the point.

⁴⁷³ C.f. "War is the father of all" (Hippolytus, *Refutatio* IX.9.4, Fr. 53 D = 29 M = 83 K, part), and "even the posset separates if it is not stirred" (Theophrastus *De Vertigine* Fr. 51 D = 27 M = 77 K).

The evidence for the Early Stoics' interest in Heraclitus is in a sense less doctrinal than scholarly. Sphaerus and Cleanthes both wrote treatises on Heraclitus⁴⁷⁴. We do not know either the content of these works or what access to Heraclitus' teachings they had. It does not seem likely that they had access to the book of Heraclitus (if he in fact wrote one) since there is no reason to suppose that either Aristotle or Theophrastus had access to his work.

The strongest piece of work by a Stoic we possess that clearly demonstrates the connection of Stoicism to Heraclitus is Cleanthes' *Hymn to Zeus*. However since this work does not directly relate to the subject of this thesis I will not devote much to its analysis which in any case has been dealt with excellently by Long⁴⁷⁵. If the Stoics were in fact working from a similar set of fragments to those which we possess then the fact that they felt at liberty to interpret Heraclitus' philosophy as a spiritual precursor to their own becomes more understandable⁴⁷⁶. With such a paucity of evidence who would dare, or bother, to argue with the Stoics' claim? The real question then becomes: how valid, based on the evidence we have, is the Stoics' interpretation of Heraclitean natural philosophy? And how much can this seriously be taken to influence their doctrine of the material substrate of the sensible world?

⁴⁷⁴ DL. 7.178, 7.174

⁴⁷⁵ Long (1996).

⁴⁷⁶ I disagree with Long's assertion that the Stoics, Cleanthes in particular, must have had greater access to Heraclitus' works than we do on the basis that the *Hymn to Zeus* displays such a startling similarity to Heraclitus' thought. We can, after all, only make this judgement based on the similarity to the fragments which we possess, and if we can see the parallels there is no reason to suppose that Cleanthes needed any more than we possess in order to pay an *homage* to Heraclitus.

4.1.2 Ekpyrosis:

A source of debate over the validity and popularity of Stoic interpretation is in the subject of *ekpyrosis*. Accordingly I will take this as an example of the Stoics' relationship to Heraclitus on philosophical matters. There are those who are of the opinion that the main reason later thinkers assert the theory of *ekpyrosis* of Heraclitus is due to Aristotle and that he held no such theory⁴⁷⁷. The continued, or otherwise, existence of the *kosmos* is an excellent point of discussion owing to its implications for the material principle. I will, thus, take it as a case-in-point of Stoic interpretation of Heraclitus and use it to exemplify the Stoic interpretation of Heraclitus' natural philosophy in general.

For the early Stoics the combination of matter and god, that is the Whole⁴⁷⁸, alternated between being as it is now – ordered – and a state of pure fiery existence⁴⁷⁹. In that state everything that exists in a fiery state, making everything pure god. This is the state of *ekpyrosis*. Seneca tells us that this is a positive state and that the cosmos is in fact an aberration from the perfect state of *ekpyrosis* when god exists perfectly with himself⁴⁸⁰. The cycle alternates between the cosmos and the state of *ekpyrosis* each following from the other. The cosmos that exists at each time is in essence the same. It is the same because god produces what is best and there could be no reason for deviation from that. As a result every event recurs endlessly and the repetition stretches back in time infinitely and will continue infinitely. This raises several points of interesting discussion but none of them concern us for the purposes of this thesis⁴⁸¹. What does is the idea of the underlying material which persists throughout the process, in the cosmos and at *ekpyrosis*. For the Stoics it is *apoiros ousia* that is turned now this way, now that. While there is no direct evidence either way to help us to a certain conclusion we might tentatively suggest that since *apoiros ousia* is absolutely passive, each time that Socrates appears in the world he is constructed from the very same dimensions of *apoiros ousia*. It may be easier for our modern minds if we think of *apoiros ousia* as a three-dimensional matrix replete with coordinates then the very same coordinates would correspond to Socrates in each of

⁴⁷⁷ (2002, pg. 61) quite clearly blames "Aristotle and the Peripatetics", who could then be plausibly responsible for passing this on to the Stoics.

⁴⁷⁸ E.g. Sextus Empiricus *Against the Professors* 9.332 (= 44AL&S = SVF 2.524 part).

⁴⁷⁹ Which, though counterpoised to the *kosmos*, should not be understood as disorder.

⁴⁸⁰ Seneca *Letters* 9.16 (=46OL&S = SVF 2.1065).

⁴⁸¹ E.g. the issue of the identity of indiscernibles and its impact on the notion of eternal recurrence.

the infinite occurrences of his lifetime, and so on for the rest of the world. This may not be exactly the way the Stoics would have thought about it, but that, I suggest, is most likely because they lacked the language – not the idea. The idea of matter as a co-ordinated three-dimensional matrix would be something that they would probably be very happy with. I raise this as it reinforces the absolute passivity of the material principle and its reliance on the active for any kind of alteration. It also very clearly shows the continuous nature of the material principle. It is not created nor is it destroyed; it is most firmly one of the two principles of reality and does not derive its reality from anything else.

The Stoics moved to the idea of *ekpyrosis* from observation. All the parts of the cosmos decay and cease to be. All animals are born and die and have offspring⁴⁸². If the parts are perishable then it follows that there is good reason to suppose that the whole is capable of dissolution. Being an organism (broadly speaking) the cosmos should have a lifespan. But god cannot die and so his form alternates: he produces himself from himself – he is both father and son in eternal derivation.

The theory fell into disrepute fairly quickly with followers of Chrysippus unconvinced about the need or practicality of *ekpyrosis*⁴⁸³. One concern was that there would be nothing for god to do during *ekpyrosis*. A more serious concern is one raised by Aristotle in his *de Philosophia* where he likens a god who would destroy his creation to a small child kicking down sandcastles:

If (the new world) is like (the old), its artificer will have laboured in vain, differing in nothing from silly children, who often when playing on the beach make great piles of sand and then undermine them with their hands and pull them down again⁴⁸⁴.
(Trans. Barnes/Lawrence)

Plato, like Aristotle, undoubtedly believed in the eternity of the world⁴⁸⁵. Although in the *Timaeus* it is written that god *could* destroy the world he would not as it would be against his goodness⁴⁸⁶. However Aristotle was writing before the Stoics so it

⁴⁸² Most at least try to have offspring.

⁴⁸³ Boethus of Sidon and Panaetius. See Philo *On the Indestructibility of the World* 76-7 (=46PL&S).

⁴⁸⁴ *De Philosophia* fr. 19c Ross = Fr.21 Rose.

⁴⁸⁵ Once it was created, if it was created which we do not know and opinion is split on the matter.

⁴⁸⁶ 41a-b.

seems likely that he had someone else in mind when he raised the doctrine of a perishable world else the criticism would seem rather redundant. As it happens he tells us in the *Physics* that both Empedocles and Heraclitus thought the present world would alternate between its ordered state and another:

That the world was generated all are agreed, but, generation over, some say that it is eternal, others say that it is destructible like any other natural formation. Others again, with Empedocles of Acragas and Heraclitus of Ephesus, believe that it alternates, being sometimes as it is now and sometimes different and in a process of destruction, and that this continues without end⁴⁸⁷.
(Trans. Stocks)

If the Stoics are falsely ascribing *ekpyrosis* to Heraclitus then they were not the first and had an impressive precedent in the intellect of Aristotle. *Ekpyrosis*, as the name suggests, requires fire. For the Stoics this is explicitly stated and is the case because of the fiery nature of the active principle – *pyr technikon*. Heraclitus is well known to have held fire to be the most important element and Aristotle tells us quite clearly that he, like the Stoics⁴⁸⁸, thought that everything would at some point become fire:

For generally, and apart from the question how any of them [the elements] could be infinite, the universe, even, if it were limited, cannot either be or become one of them, as Heraclitus says that at some time all things become fire⁴⁸⁹. (Trans. Hardie & Gaye)

The clear implication here is that all things become fire at the same time. If it were a simple notion that each element will at some point change into fire, while others change into another to retain some sort of balance, then it is unlikely that Aristotle would bother to raise the point as he himself, along with Plato, believed this too. This is not to say that Heraclitus did not believe in the transmutation of elements. Indeed if at some point all the elements become fire transmutation is a precondition. How this happens though is not clear. He does, however, speak of “turnings”:

⁴⁸⁷ *On the Heavens* 279b15.

⁴⁸⁸ E.g., (regarding the Stoics): “ultimately the whole world will take fire...thus nothing will remain but fire” – Cicero *De Nat. De.* II 118.

⁴⁸⁹ *Physics* 205a1-3.

“turnings of fire: first, sea; and of sea, half earth and half burning...sea is dispersed and is measured in the same proportion as there was before.”⁴⁹⁰ (Trans. Barnes)

This tantalising fragment does not tell us if there is an underlying matter consistently present beneath the change or if, as King holds of Aristotle⁴⁹¹, transmutation can occur simply through the transfer of properties alone with the elements actually being the minimum matter. It is perfectly possible that the issue and consideration never occurred to Heraclitus and so the distinction is perhaps redundant. I will come back to the specific issue of a material principle in Heraclitus after this discussion of *ekpyrosis*.

Not only do we have Aristotle’s evidence stating that for Heraclitus the world alternates between order and “another state”, but we can also infer, along Stoic lines, another reason for thinking he held something like *ekpyrosis*. One reason we saw the Stoics giving for *ekpyrosis* was that the parts of the world are destructible and that this led them to suppose the destructibility of the whole. Heraclitus’ most influential doctrine, for Plato at least, was undoubtedly the doctrine of flux. Is it not reasonable to ascribe a similar train of reasoning to Heraclitus as we find in Stoicism? If the parts of the whole are in flux does it not seem reasonable to suppose that the whole is in flux too? If the formed *kosmos* is, paradoxically, characterised by disorder and instability then the *kosmos* would change to being at peace and stability if only for a time. This would mirror the positive nature of *ekpyrosis* found in Seneca⁴⁹². It is not impossible to see a Stoic interpreting Heraclitus as implying that the doctrine of flux will entail the change from a system of flux to one of non-flux, the divine peace of *ekpyrosis*, and then back again in an infinite loop. It may be a misinterpretation but it is an understandable and attractive one.

Despite the evidence for the reasonable interpretation of Heraclitus as holding a theory of cosmic flux, later termed *ekpyrosis*, some see the idea as too far

⁴⁹⁰ Clement *Stromateis* v.104.3 (=Fr. 31A D = 53A M = 38 K).

⁴⁹¹ King (1956). CF. Furth (1988).

⁴⁹² *Letters* 9.16 (=46OL&S = SVF 2.1065).

fetched⁴⁹³. The most common reason for thinking that the Stoics misinterpreted Heraclitus or deliberately misrepresented him is due to fragment 38⁴⁹⁴:

This world neither any god nor man made, but it always was and is and will be, an ever-living fire, kindling in measures and being extinguished in measures⁴⁹⁵. (Trans. Barnes)

This statement is taken to be incompatible with a doctrine of *ekpyrosis*. However if the world repeats in cycles of order and disorder then is not everything that exists, by turning from being completely and only fire to being only part fire, continuously existing – whether it is ordered in a particular way or not? The only problem comes from the fact that “world” renders *kosmos* – literally: order. Heraclitus was not called the obscure for nothing and Aristotle criticises him for his lack of clarity⁴⁹⁶. I would suggest then that Heraclitus is potentially having a little joke with us (provided that Clement’s reportage is literal). There are two possibilities:

1. By “order” Heraclitus is in fact referring to the state that the Stoics would later call *ekpyrosis* as this is the state when there is just fire and no flux.
2. This *kosmos* – what we know as the “ordered” world - is in fact a state of disorder⁴⁹⁷. This world is constantly riven by flux; flux or constant disorder being the only order that there is.

The constant existence of fire, no matter how minimally it exists is the basis for all the order and creation in the world and it is this, I suggest, that Heraclitus is talking about.

Whether or not Heraclitus himself actually held a doctrine of *ekpyrosis* as found in Stoicism, (and we have seen much to suppose that this is a reasonable interpretation for the Stoics to have held at least), is almost irrelevant. What this discussion has shown is the reasonable inferences drawn by the early Stoics about Heraclitus’

⁴⁹³ E.g. Kahn, Long, Barnes in the works cited in this chapter.

⁴⁹⁴ This reason is cited by Barnes (2002, pg. 61-2) as definitive proof since he sees the two positions as completely irreconcilable and understands this fragment as authentic.

⁴⁹⁵ Clement *Stromateis* V.103.6 (=Fr. 30 D = 51 M = 37 K).

⁴⁹⁶ *Rhetoric* 1407b14-25.

⁴⁹⁷ Where “disorder” more properly represents distance from god or, for the Stoics, distance from god’s natural state.

philosophy which there is no reason to suppose they based on much more evidence than we possess. If they could read a justification for such a novel view as *ekpyrosis* into Heraclitus' fragments then how much more likely is it that they found supporting reasons for their doctrine of *apoiōs ousia* in the great master of natural philosophy? This is what will be looked at in the next section.

4.1.3 Fire, matter and god:

Heraclitus' surviving fragments revolve around two main topics that concern the subject of this thesis: flux and extolling the virtues and importance of fire. This part of the chapter will look at the role of fire in Heraclitus' philosophy and see how it relates to fire and matter in Stoicism. The role of fire is important in this respect because, as I will show, fire seems to play a dual role in Heraclitus' natural philosophy while the Stoics, as we have seen, separate these roles out. Both the Stoics and Heraclitus however are monists and it is with this claim as the backdrop that our explanation will play out.

In the first chapter we saw how the Stoics have an immanent god who pervades all of reality and guides every aspect of it in the best possible way. We also saw his nature described as a pure and creative fire – *pyr technikon*. This fire went by the name of *pneuma* when engaged in certain activities: when it was causing *apoiou ousia* to take on the form of a person for instance. But god's essential nature remains fiery as this is the most directing and self-sustaining thing in creation. His will is inexorable and is epitomised in the Stoic doctrine of fate. Through all this the Stoics also maintain their claim to monism. They do this, as we saw in chapter one, through the remarkable and ingenious doctrine of *krasis*. This allowed god to permeate *apoiou ousia* absolutely. The two cannot be found apart: wherever there is god so too there is matter, wherever there is matter so too there is god. They are at most conceptually distinct but can never be found apart.

Heraclitus' monism is of a more classic form: "The wise is one: to understand the purpose by which it steers everything through all⁴⁹⁸"; "listening not to me but rather to the *logos* it is wise to agree that all things are one."⁴⁹⁹ Fire is the material principle for Heraclitus, but more than that it is also god. The Stoics require two principles because of their maxim that: "only body can act or be acted upon⁵⁰⁰", and the associated concept that no body can act on itself⁵⁰¹ Heraclitus, as far as we know, had no such maxim.

⁴⁹⁸ DL IX.1 (= Fr. 41 D = 85 M = 54 K). (trans. Barnes)

⁴⁹⁹ Hippolytus *Refutatio* IX.9.1 (=Fr. 50 D = 26 M = 36 K). (trans. Barnes)

⁵⁰⁰ Cicero *Academica* 1.39 (= 45A L&S = SVF 1.90).

⁵⁰¹ An argument that we find in Aristotle's criticisms of Plato's self-moving soul.

Heraclitus says: "the thunderbolt steers all things"⁵⁰² showing not only the traditional all-powerful nature of the king of the gods but also that fire is the mechanism of rule. However most illuminating in exposing the nature of god as co-extensive with fire is fragment 67: "The God: day/night, winter/summer, war/peace, satiety/hunger. [He] is changed in the manner (of fire) when it is mingled with spices and is named according to the delight of each of them."⁵⁰³ This fragment quite clearly says two things of god. Firstly it tells us that god is a full unity of opposites; he is everything, making the identification between active and passive easier to attribute to him. Secondly it tells us that *he is changed* in contrast to the Stoic god. Undoubtedly it is god who is causing the changing too but for Heraclitus he changes himself while for the Stoics he changes *apoiros ousia*. While the Stoic god is immanent in his creation Heraclitus' appears to be not so much immanent as identical. It would appear as though if we were to look for a material principle in a cosmogony for Heraclitus then we would have to look no further than god himself. This is different to any other theory that has been looked at in this thesis and while it has resonances with the Stoic theory it is significantly different. But is it so significantly different that the Stoics could not have looked at the situation slightly differently and found something they did like?

If we suppose that god is not in fact identical with the sensible world but separate from it and that he "steers all things" in accordance with his will and look just at what it is that, most primitively, he "steers" we will be left with his body as the equivalent of the Stoic *apoiros ousia*: i.e. fire again. In the previous section the transmutation of elements was briefly mentioned and it was asked whether or not this event requires an underlying substrate such as the Stoics' *apoiros ousia*, or whether it can occur through the simple transference of properties as we saw discussed in relation to Aristotle. Heraclitus does little to clear up this issue. The choice of fire as material substrate comes with some innate problems; after all it is as hard to see how fire can be a *material* substrate as it is for, say, water or air. *Qua* material substrate Heraclitus has this to say of fire: "fire is the element, all things are an exchange for fire and come into being by rarefaction and condensation"⁵⁰⁴

⁵⁰² Hippolytus *Refutatio* IX.10.7 (=Fr. 32 D = 84 M = 118 K). A sentiment echoed in Cleanthes' *Hymn to Zeus*: "So great is the servant which you hold in your invincible hands, your eternal, two edged, lightning-forked thunderbolt. By its strokes all the works of nature came to be established, and with it you guide the universal Word of Reason which moves through all creation." (trans. M.A.C. Ellery, 1976).

⁵⁰³ Hippolytus *Refutatio* IX.10.8 (=Fr. 67 D = 77 M = 123 K). (trans. Barnes)

⁵⁰⁴ DL. IX.8.

and: "All things are an equal exchange for fire and fire for all things, as goods are for gold and gold for goods."⁵⁰⁵ These statements are, however, too vague to answer the question. It appears, on the face of it likely that Barnes⁵⁰⁶ is right in his assessment that takes fire as being nothing more than the primary element – the original source, rather than underlying substrate. He takes the statement "everything is from X" as not implying that at any one point everything was X. Rather that it means that things can be made *from* but not *out of* fire. The idea that fire is not then an underlying substrate that persists through all formal change is appealing owing to Heraclitus' own words and the concerns that having fire as the substrate would bring. Further supporting this notion that fire is not a persisting substrate but only an exalted element are the words of Aristotle: "Anaximenes and Diogenes make air prior to water, and the most primary of the simple bodies, while Hippasus of Metapontium and Heraclitus of Ephesus say this of fire..."⁵⁰⁷ Leaving aside the horror that Heraclitus would no doubt feel at being mentioned in the same breath as another philosopher, this statement reinforces the idea of fire as an element just like the others but simply more primary. It would appear to be the case that Heraclitus could not have had much influence on the Stoic theory of matter as they would probably claim. Yet this is only one side of the coin. Aristotle also tells us:

But what these thinkers maintained was that all else is being generated and is flowing, nothing having any stability, except one single thing which persists as the basis of all these transformations. So we may interpret the statements of Heraclitus of Ephesus and many others⁵⁰⁸. (Trans. Stocks)

This clearly states that Aristotle thinks the right and reasonable interpretation of Heraclitus is that he believed in a single unchanging substrate that underlies all change in the sensible realm. This sounds very much like *apoiós ousía* and is clearly not a Stoic interpolation. However there is now a conundrum which properly earns Heraclitus his epithet "the obscure"⁵⁰⁹. A moment ago we noted that Heraclitus suggests that fire ceases to be when it becomes something else. This would make god disappear. If: "For souls it is death to become water; for water it is death to

⁵⁰⁵ Plutarch *On the E at Delphi* 388D-E (= Fr. 90 D = 54 M = 40 K).

⁵⁰⁶ Barnes (2002, pp. 62-3.)

⁵⁰⁷ *Metaph.* 987a7.

⁵⁰⁸ *On the Heavens* 298b30.

⁵⁰⁹ *Ainiktēs* DL. 9.6.

become earth: out of earth comes water; out of water, soul⁵¹⁰ and we suppose that souls are similar to god then it becomes clear that if god *is* fire and fire can turn into water and in doing so not remain fire then it follows that in so doing god kills himself. But we also know that there must be a persistent substrate. We have, thus, a problem. If god is fire and fire is not the persistent substrate, which it seems it is not, then god can die and there is a principle more fundamental than god which underlies his turnings from life to death. Heraclitus seems to have offered us a substrate which is not permanent at all, completely negating the point of a substrate. The picture is complicated and contradictory and no doubt the problems are compounded by the paucity of our sources and the strong Aristotelian interpretation that we rely on as well as our background assumptions about the nature of a substrate that Heraclitus may not have shared. We cannot know just how clear Heraclitus himself was about the concepts we have been looking at: the confusion may not be intentional or may be due to the fragmentary nature of the sources. Or it may be that contradiction and confusion is simply endemic in any discussion of the sensible world as it is itself constantly changing.

How could the preceding discussion relate to the Stoics? Clearly they were attracted to Heraclitus because of his monism, his pantheistic god, and the emphasis on fire which mirrored their own conclusions. A fiery god who directs all things in a world which, since "all things are one" and "good and evil are the same thing as Heraclitus says⁵¹¹", must be the best has clear resonances with Stoic theology. In clearly not distinguishing the active from the passive (for the active is the passive) Heraclitus differs from the Stoics even though they claim to be monists too. As a result the material principle of Heraclitus has a peculiar relation to that of the Stoics and it seems unlikely that he will have had the same influence on the development of the material principle that Xenocrates did. Barnes' rejection of a cosmogony in Heraclitus does not remove the issue of how, since god is fire, fire can change and fail yet also be said to continuously persist as god. It is not enough to reply that as long as there is some fire then god survives in that since god would then be limited in his existence to certain places. Instead god is everywhere irrespective of how it is disposed – fiery or not – as the following anecdote shows⁵¹²: It is said that when

⁵¹⁰ Clement *Stromateis* VI.17.2 (= Fr. 36 D = 66 M = 102 K).

⁵¹¹ *Topics* 159b30.

⁵¹² Aristotle *Parts of Animals* 645a19. The text says they found Heraclitus at his oven, which may be a euphemism for "toilet" – which would explain why they were embarrassed.

some people went to visit Heraclitus in his home they found him at his oven. They were embarrassed but Heraclitus replied that even here there are gods. There is nothing that is too base for god to have a share in and as a result he is all things.

It would not be too hard to see the considerations that have been raised here as inspiring the Stoic division between the active and passive principles. The same considerations also explain the division between *pyr technikon* and *pyr atechnon*⁵¹³. Seeing the difficulty in having fire as the persistent substrate when elemental transmutation is also accepted would not have been difficult given the teachings of Xenocrates and Plato. So instead they move a level down to abstract resisting three-dimensionality. They also realised the issues raised by identifying god not only with the persistent substrate but also with an element. However the identification of god with fire is appealing owing to the biological models prevalent at the time and so they separated out two types of fire.

All of this can be read into Heraclitus with a little imagination and the Stoics were certainly not short of that. Heraclitus was undoubtedly an influence but he was not a direct teacher in the sense that the Stoics could not have incorporated much of his natural philosophy into theirs. The interpretations that have been posited here are not necessarily obvious or immediate ones that would be reached. Instead it is more likely that in interpreting Heraclitus the Stoics clarified their views rather than coming up with them.

⁵¹³ Indeed Long (1996, pg. 43) thinks it possible that the Stoics thought Heraclitus himself made the distinction between two types of fire: one elemental the other creative.

4.2 Biology and the Mythic Account:

Philosophy does not take place in an intellectual vacuum. In light of this fact this part of the thesis will look at biological imagery in regard to embryology and the mythological treatment of matter and creation. The Stoics themselves were fond of the "science" of etymology as we saw in the first chapter with Chrysippus' explanation for the origin of the word god coming from *Zēn* "in so far as he is responsible for, or pervades life [*zēn*]⁵¹⁴", reinforcing the Stoic concept of an immanent god and the theory of total blending. The religious and cultural developments that took place in the past or near past, including the poetic accounts of the creation, will have furnished the intellectual background and cultural education of all students who would later come to philosophy. It is therefore necessary to understand what these background elements would have suggested and that subsequently philosophers would have adopted⁵¹⁵. The interpretation of cosmological myth was frowned upon by Plato as a waste of time⁵¹⁶. Despite this his successor Xenocrates was more inclined to mythologizing accounts and daemonology resulting in his being branded an "inferior intellect⁵¹⁷" by Guthrie. Both Speusippus and Xenocrates are known, as we have seen, to have had a great deal of interest in Pythagoreanism and also in its correlate: Orphism. Such a pedigree of general mythologizing in Greek culture as proto-philosophy mixed with its analysis by serious near contemporary philosophers no doubt influenced the direction of the thought of Zeno during his time at the Academy. To get a flavour of the culture of intellectual thought that was being developed in the late fifth or early fourth century BC I will look at the relevant parts of the Derveni Papyrus. This interesting document is of uncertain date and authorship⁵¹⁸ but serves to demonstrate the relationship of myth to philosophy as the author is at pains to point out that those who have problems believing the terrors of Hades do so because they are taking the words of the poets too literally and that we must delve behind the words to the real meanings behind

⁵¹⁴ DL 7.147 (=54A L&S = SVF 2.1021, part). (Trans. L&S)

⁵¹⁵ However Burnet (2005) is of the opinion that "it is quite wrong to look for the origins of Ionian science in mythological ideas of any kind." Pg. 13. Contrast this to Cornford's (1957) view: "there is a real continuity between the earliest rational speculation and the religious representation that lay behind it."

⁵¹⁶ *Phaedrus* 229d-230a.

⁵¹⁷ Guthrie, 1978 vol. v. pg. 474.

⁵¹⁸ I am not entirely convinced by Richard Janko's (2001) argument in ascribing its authorship to Diagoras of Melos. The latest possible date is that of the cremation of the papyrus which is perhaps the fourth century (possibly mid fourth). It can, thus, serve as an independent indicator of pseudo-philosophical thought and interpretation that would form the background for Speusippus' and Xenocrates' thought and hence inform that of Zeno's.

them⁵¹⁹. This type of esoteric teaching and cult knowledge was obviously popular in the ancient world and I will not attempt an analysis of it or its relation to philosophy. Instead I will look more at the pedigree of matter in “popular” thought to see how the Stoics used “popular cultural” imagery to reinforce the ideas of their philosophy and make it more accessible and acceptable to their contemporaries⁵²⁰.

Diogenes Laertius offers us the following account of the cosmic genesis according to the Stoics:

In the beginning all by himself he (god) turned the entire substance through air into water. Just as the sperm is enveloped in the seminal fluid, so god, who is the seminal principle of the world, stays behind as such in the moisture, making matter serviceable to himself for the successive stages of creation⁵²¹.
(Trans. L&S)

An interesting thing to note in passing is that god seems unable, even at the most basic level, to deviate from the established formula for elemental transformation. Diogenes continues his explanation: “The world is created when the substance is turned from fire through air into moisture.” The term “substance” denotes, in this case, the material principle. This account shows us something about the nature of the material principle in Stoicism and its relation to the established mythology of Greece. In both cases god is turning *apoiros ousia* from fire into air and then into water. Once there is water he then continues to the next level of creation; that of particular things: “Thereafter by mixture plants and animals and the other natural kinds are produced.” The initial fire, the first thing produced, which *apoiros ousia* is turned from is clearly representative of the state of *ekpyrosis*.

This elemental fire is fully transformed into air and then condensed into water⁵²². It seems that Diogenes is attributing to the Stoics the notion that water is somehow the most suitable disposition of matter that the active principle can work on. It is not the

⁵¹⁹ Col. 5, 7, for an example see Col. 8.

⁵²⁰ Cf. Plutarch *On Isis and Osiris* 367c – “[The Stoics say the] creative and fostering power is Dionysus, the truculent and destructive is Heracles, the receptive is Ammon, that which pervades the Earth and its products is Demeter and the Daughter, and that which pervades the sea is Poseidon.” (Trans. Babbitt)

⁵²¹ DL. 7.135-6 (=46B L&S part = *SVF* I.102, part)

⁵²² Following the established tradition of the order of elemental transmutation.

case that god is turning parts of the material principle into air and other parts into water in order that all the elements exist; for Diogenes has told us that god: “turned the *entire substance* through air into water.” Water possesses, then, some power of base materiality. If god is going to make the world, and he is, then he is going to make it out of water. The question that this part will help us answer is: Why water?

It is this notion of matter as water that I will look at, briefly tracing this conception in myth⁵²³, early philosophy and medicine as each relates to the present subject. Its relationship to the female will be looked at as will both water’s and the female’s relationship to the passive nature⁵²⁴. Water will be looked at in this part as the primary principle since this account forms the backdrop of thought in which the Stoics were working. In looking at myth, which I will do only briefly, I am following much the same supposition that I did above in regard to the relationship of Stoicism to Heraclitus: That the germs of Stoicism can be found in these writers but that the Stoics did not seriously think that their ideas existed in these earlier writers; any resemblance was most likely by chance, or dubious interpretation, but appealing to ancient authority was still an appealing notion. This is, as Long states⁵²⁵, contrary to the received opinion that the Stoics saw the Ancients as in possession of truth about the world: “According to this received opinion the Stoics took Homer (and other early Greek poets, especially Hesiod) to have a correct understanding of the world – its physical structure and processes, its god(s), its basic causes and purposes.⁵²⁶” For the Stoics to have thought that the ancients were in possession of the “truth” they would have had to suppose that they were in fact saying the same thing as the Stoics, and it is hard to credit that the Stoics really thought Homer and Hesiod were saying the same things as they were. This, however, did not stop them crediting their predecessors with ancient wisdom, but this is surely more a political move than a genuine account of the historiography of their school.

⁵²³ Cf. Baldry (1932): “Mythical and symbolical notions are often replaced in time by more scientific ideas.” Pg. 28.

⁵²⁴ One should always keep in mind that when the Stoics talk of a female god or power they are doing so for explanatory purposes only and not because the terms relate to an actual entity – Although of course the traditional gods do exist but not at the level of importance that is the subject of this thesis so references to Hera and Zeus are illustrative only.

⁵²⁵ Long (1996, pg. 58. Cf. pg. 64): “The Stoics were rationalists and they were also empiricists. They don’t talk nonsense, and it is frankly nonsensical to suppose that Homer was a crypto-Stoic.” That Homer was really teaching Stoicism is not something I believe the Stoics could seriously have thought. However in interpreting Homer it is surely possible to find ideas sympathetic to the Stoic cause, and this I would suggest is all that was happening.

⁵²⁶ Long (1996 pg. 59)

In his discussion of the relationship of Stoicism to poetic accounts Boys-Stones raises the point that the Stoics were seen as using previous accounts to support their position:

Their (the Stoics') interest in Homer and Hesiod, and the allegorical interpretations they offered of their poems, were a way of justifying their position at the centre of Greek culture – and were perhaps, as the Epicureans insinuated, a way of appropriating their authority for the doctrine of Stoicism too⁵²⁷.

While I agree with Long, and I doubt anyone would disagree, that Homer and Hesiod were not in fact crypto-Stoics and the Stoics did not believe they were; it does not mean that they could not have spotted some obvious parallels and marvelled at the similarity of thought in these earlier thinkers. This is not withstanding Boys-Stones' well argued point that the Stoics had little time for the poets as serious thinkers⁵²⁸; though he goes on⁵²⁹ to mention that the Stoics did hold, as did Aristotle⁵³⁰, that the poetic accounts did contain germs of ancient wisdom – especially in regard to the naming of gods. The poets may not furnish much; but to the trained eye they can offer a glimpse back to the time when mankind was closer to god and so there is wisdom in their stories – even if it is deeply hidden. The Stoics could take these hints and turn them to their advantage by using them to establish their philosophy in acceptable sources – a cynical method of exploitation.

That the Stoics had an interest in Homer and Hesiod is supported by the fact that Zeno wrote five books on Homer⁵³¹ and Chrysippus too wrote philological commentaries⁵³². So, like all educated Greeks the Stoics were familiar with the poets and perhaps owing to their foreign birth⁵³³ would have been all the more eager to demonstrate the relationship of their thought to that of the established national poets. In support of the influence of myth on the conception of the Stoic material

⁵²⁷ Boys-Stones, 2001, Pg. 32.

⁵²⁸ Cicero *DND* 2.70-1 says that it is stupid to repeat the stories of the poets, however there are some things in them that are helpful.

⁵²⁹ *Op. cit.* pg. 36.

⁵³⁰ Cf. *Metaph.* 1074a38-b14.

⁵³¹ DL. 7.4.

⁵³² DL. 7.189-200.

⁵³³ E.g. Zeno "the Phoenician" Cf. DL. 7.3: "Why run away, my little Phoenician?"

principle I will look at just two passages. The first is an argument from silence but points in the direction of matter as wet or water:

There was a famous and obscene painting at Argos which showed Hera fellating Zeus (*SVF* II.I071-4). Chrysippus explained this (do we know he was utterly serious in doing so?) as an interaction between the two Stoic principles, Zeus/god and Hera/matter. Interestingly enough, this interpretation does not invoke the standard Stoic etymology, Hera/*aēr*⁵³⁴.

Whether or not Chrysippus is being entirely serious does not really impact on the interesting omission that Long draws our attention to. Why does Chrysippus not use the standard etymology of Hera from air? Although the evidence is weak it is not unreasonable to suppose that since he was using Hera as a synonym for the material principle Chrysippus was reluctant to use air as one too since the proper elemental synonym in this case would be not air but water. In order not to contradict himself Chrysippus refrains from calling the material principle air. Since Chrysippus has refrained from calling the material principle air in this instance it seems likely that another candidate should stand in its place; the next obvious element, as will be shown, is water. The science of etymology lets the Stoics down in this case. It is far easier to understand, especially in light of the Diogenes Laertius passages above and medical imagery of the time, Hera being matter *qua* female and not *qua aēr*. The matter that is being referred to here should not be confused with *apoiōs ousia*. Although it would be understandable to contrast the active principle, which is called Zeus, to *apoiōs ousia* and refer to the latter as Hera the Stoics cannot do this seriously for the following reason: They are monotheists so god cannot have a counterpart.

Any talk of a second deity is clearly allegorical and a teaching aid. Meijer remarks, and it seems clearly true, that the distinctions made between male and female gods are the result of poetry only and not of serious philosophy expressing his position with the following remark: "The gods are said to be of two sexes, so that when they

⁵³⁴ Long (1996 pg. 75) The account is also dealt with by Meijer (2007. Pp. 104-5.)

are active, they are males, and females when they have a nature of a passive object.⁵³⁵

There is only one god and his names vary according to its functions. The matter being referred to, not only by Chrysippus but by Diogenes in his account of substantial change, is not bare *apoiós ousia*. Instead it can only be proximate matter. This means our speculation ends up with the rather strange conclusion that the barest qualification for matter is in fact water (which is a combination of the active and passive principles). We saw in the first chapter that if we were to ask what is the barest matter out of which things were made, the Stoics would answer the four elements, since *apoiós ousia* always exists in the barest qualification as at least one of these: at *ekpyrosis* and just after, and just preceding the birth of the cosmos. First of all there is fire, then all elemental fire becomes air so that the active may have the barest – or most opposite of the active – type of matter to act on: water. Even god is constrained by his own laws of ordered elemental transmutation. For the process of cosmic creation to start god first needs to move all of *apoiós ousia* from being fiery to being something akin to its (*apoiós ousia*'s) actual nature. The most passive element (because it is opposite to fire) is water. Hence when god wants to create the world as we know it he needs a perfectly passive element to work on, which, since he is “fiery”, can only be water.

The second passage in support of the mythic influence on the conception of matter as water relates directly to Zeno and his interpretation of Hesiod. Regarding the pre-cosmic chaos as it appears in Hesiod we are told that Zeno interpreted it along the following lines: “Zeno interpreted Hesiod’s *chaos* as ‘primal water’, deriving the word from *chysis* or *cheesthai* (*SVF* I.I03-4) meaning ‘pouring’.⁵³⁶” The *chaos* is the “out of which” in the Hesiodic account, accordingly it parallels the *apoiós ousia* of Stoicism. If the mythologizing poets can furnish the ancient and cultural tendency for interpreting bare matter as water as far as the Stoics are concerned we have still uncovered only part of the picture. The Derveni papyrus is an attempt, much in the vein of the received opinion of Stoicism in relation to the poets, to demonstrate that the poets are allegorisers with a hidden truth. The truth, as far as the Derveni author is

⁵³⁵ Meijer (2007. Pg. 102), Cicero *De Natura Deorum* 1 36 says that Zeno taught that the names of the gods were allegorical of “dumb things”, which suggests that he accepted this division of active and passive to male and female.

⁵³⁶ Long (1996 pg. 80).

concerned, is known by the poets; while we have seen that whether or not this is the case is irrelevant to the Stoics. What matters is that they can read their philosophy into the poetry without making too many ludicrous assumptions and it is at any rate, as Long said, far fetched to suppose that the Stoics really thought of their predecessors as proto-Stoics. They can still adopt and adapt the common notions to support their philosophy though it is cynical exploitation rather than a genuine belief that Hesiod is teaching Stoicism. The passages in the Derveni papyrus that I will look at are those explaining the material principle. Looking at how the author describes this and draws the meanings from the poets will help to furnish us with the intellectual mythologizing mindset of the mid 5th to the mid 4th century B.C.⁵³⁷. This mindset should have resonances with the early Stoics as they came out of the mythologizing Academy.

In column 10⁵³⁸ the author states Orpheus' real meaning behind terming night "nurse": "By saying that she is nurse, he (sc. Orpheus) expresses in riddling form that whatever the sun dissolves by heating, the night unites by cooling." At column 22 he continues:

Earth (Ge), Mother (Meter), Rhea and Hera are one and the same. She was called Earth (Ge) by convention; Mother, because all things are born from her. Ge and Gaia according to each one's dialect. And she was called Demeter as the Mother Earth (Ge Meter), one name from the two; for it was the same.

The issue of the roles of air and water, splitting them into what can be understood as active and passive, becomes confused in column 23:

...but to those who understand correctly it is clear that Okeanos is the air and air is Zeus. It is not the case that another Zeus contrived Zeus, but that the same one (contrived) for himself great strength. But those who do not understand think that

⁵³⁷ The author's references to Heraclitus (Col. 4) in his works means it must post-date him and also shows that the author was well educated and possibly well travelled. Such an individual can be fairly safely taken as an average representative of the intelligentsia of Ancient Greece.

⁵³⁸ All translations are taken from Betegh (2006).

Okeanos is a river because he (sc. Orpheus) added the epithet "broadly flowing".

The author has also gone to great pains to identify the phallus, which is responsible for Zeus' power, with the Sun⁵³⁹. From these passages we can make the following conclusions about the intellectual or cultic explanation of myth. The sun is the male principle which, as for Heraclitus, is not only a vitalistic power but also a destructive one if left unchecked⁵⁴⁰. To counteract the over-zealous power of the sun/male/Zeus the cooling principle is one which draws together. Thus Night and coolness are the counterpoint to sun/Zeus. The night bounds the destructive power of the sun acting as a necessary power opposed to it that is supported by necessity and justice. As a result of this description the two aspects (night and sun) become two principles.

The material principle is the binding principle which we have seen identified with night⁵⁴¹. We have also seen that "She" (the material principle) is called "mother" because "all things are from her". The identification of night with mother seems perfectly reasonable in this context, two systems of opposites – night with day and Hera with Zeus. In the final passage we are told that Okeanos, who is an aspect of the power of Zeus, is not actually a river as would be natural to assume but is in fact air. Air is also explicitly identified with Zeus. The positive outcome of that passage is that water is not identified or associated with the active principles. On the other hand air is identified with Zeus. This can, and I think should, be understood along the lines of an Aristotelian and Stoic division of active and passive elements⁵⁴². Air and fire are the two active elements in the traditional interpretation of Stoicism⁵⁴³, though I have argued that this is a bit of misnomer based on a misunderstanding of *pneuma*. It would be plausible to suppose that this misunderstanding, so prevalent in the Ancient world, occurred because of the popular educated distinction of fire and air as the two active elements, as we find in the Derveni papyrus⁵⁴⁴. If these two are active and we can suppose that Ge or Gaia is earth then water must also be associated with earth

⁵³⁹ Col. 13: Orpheus is "likening the sun to a phallus."

⁵⁴⁰ The Derveni author quotes Heraclitus Fr. 94 (Plutarch *De Exilio* 604A = Fr. 94 D = 52 M = 44 K) in Col. 4.

⁵⁴¹ Enveloping the male active principle, just like in a biological simile.

⁵⁴² Derived, as we will see, from the medical theory of Philistion who in turn is said to have derived them from Empedocles.

⁵⁴³ Cf. Galen *On Bodily Mass* 7.525, 9-14 (=47F L&S = SVF 2.439, part), Plutarch *On Common Conceptions* 1085c-d (= 47G L&S = SVF 2.444, part), Galen *On Hippocrates' and Plato's Doctrines* 5.3.8 (=47H L&S = SVF 2.841, part), Alexander of Aphrodisias *On Mixture* (=47I L&S = SVF 2.442, part).

⁵⁴⁴ And indeed in Aristotle, see chapter 2.2 pg.103

as a passive element. This also relates to Stoicism when we are told that earth and water lack *tonos*⁵⁴⁵.

A plausible interpretation by way of natural philosophy of the Derveni author's meaning is along the following lines: God *qua* god and his power is fire – from the identification of the phallus with the sun. But if he is to act on the world he must do so in a mediated fashion since fire is too powerful –hence the Erinyes controlling the sun. To do so Zeus “reduces” himself to air – from the Okeanos passage. The matter that this air acts on and from which all things are is the female principle Ge or earth. But underlying, in parallel to the fire/air Zeus/Okeanos relationship, earth or Ge is Rhea or water – from the reasonable etymology Dillon employs in his interpretation of Xenocrates: of Rhea from “flowing”⁵⁴⁶, which relates to Zeno's etymology of Hesiodic *chaos*⁵⁴⁷.

I would not go so far as to suppose that the Derveni author is a proto-Stoic or in fact related to them in any way. What this discussion has shown is that, whether or not the ultimate conclusions I have drawn are in fact what he is trying to demonstrate, this is not an unreasonable way to see popular myth through Stoic eyes. If this sort of thing were going on around the time of the Stoics and in the intellectual circles they mixed in then the relationship of the female and the element water to the material principle becomes a symptom of cultural tradition. Myth no doubt did not influence the interpretation or understanding of matter so much as furnish it with a context which lent cultural support to an otherwise “foreign” school.

⁵⁴⁵ See note 545.

⁵⁴⁶ Dillon 2005, pg. 104.

⁵⁴⁷ Cf. Baldry's (1932) explanation of Pherecydes: “who seems to me to have based his cosmogony on a combination of two conceptions of the microcosm – the mythical equation of the male with Heaven, the female with Earth, and the seed with Eros, and the more rational explanation, in which the embryo forms itself from the three essentials of life, ‘the hot,’ ‘the cold,’ and ‘the wet.’” The elements, apart from earth, were created by Cronos from his own seed. The Stoics would just be in a long line of thinkers taking part in the same activity. I do not share Barnes' opinion that Pherecydes is a mere literary curiosity with nothing philosophically important to say.

4.3 The Impact of the Natural Philosophers and Medical Theory:

The most relevant aspects of the contemporary medical teachings have been seen in the first chapter and so I will not repeat myself too much here. As well as biological imagery I will also very briefly mention the philosophical antecedents of water as primary matter and the notion of an underlying substrate, though these are unlikely to have had any but the most indirect influence on any later physical theory. Contemporary medical theory and imagery would be familiar to the Stoics as a way of expressing the relationship between *primarily* active and passive constituents while fitting in with established mythic models. It will be worth our while to at least look at some of the instances of embryological discussion to see how women were identified with the more passive aspect of creation even in the science of medicine⁵⁴⁸.

Aristotle furnishes us, at *Metaphysics* 983b6, with the information that Thales believed that water was the most primary element. All of the first philosophers, we are told, thought the elements were the principles of things. Aristotle conjectures that Thales thought water to be the origin of all things because all things are seen in some way to rely on the moist and so it is through the principle of moisture that they come to be. Further, Aristotle informs us in his *De Caelo*⁵⁴⁹ that according to Thales the Earth rests on water on the basis that water can support other things, like logs, but water always "seeks" a lower level. We can imagine Thales having a conception that each element has its natural place and that the natural place of water is at the bottom and since all things would sit on that perhaps that was enough to make him suppose that they rely on it. Whatever the reasons that Thales had it is doubtful that the Stoics had access to any more information about him than Aristotle did and Aristotle seems unsure as to what Thales was intending to explain by claiming water as the element *par excellence*. Thales' conception of water as primary element can be safely confined to part of the general backdrop of physics and relatively unimportant in relation to the Stoics.

It seems unlikely that any pre-Socratic theory or philosopher exerted any decisive influence on the Stoics, either in the form of Heraclitus or anyone else. However the

⁵⁴⁸ Baldry (1932) was convinced of the relationship between early philosophy, myth and medical analogy: "...some aspects of early cosmogony can be properly understood only by comparison with embryological beliefs". P. 28.

⁵⁴⁹ 294a28

general influence of the pre-Socratics on the intellectual climate of Greece is without doubt very high and so it is interesting to note that the Stoics for all their appearance as wayward thinkers were really adopting and adapting common place language and imagery⁵⁵⁰; and, further, justifying this use by relating their philosophy to the person of Heraclitus.

The medical influences on philosophy in the 4th century are difficult to assess and I will not in any way attempt to explore the complex relation of medical theories to philosophy here⁵⁵¹. Instead I will look at theories of insemination and embryology to see how the idea of the sperm as hot and breathy substance relates to Stoic theories of cosmogenesis. Though most medical theories held that both parents contributed seed Aristotle had his own theory. He held that it is primarily the male sperm that informs the passive female menses to create the embryo. In the earlier writers it is the preponderance of either male or female seed which determines the sex of the child while for Aristotle it is more the relative strength of the male to mould the female principle.

The Stoics, in common with most other ancient philosophers, employed biological parallels to explain the workings of the cosmos. In particular they also moved from microcosm to macrocosm. The naturally occurring relationship of men and women in the creation of a child so clearly parallels that of the idea of cosmic creation that it is no wonder that not only myth but natural philosophy is replete with it⁵⁵². The Stoics were no different and found the imagery useful, as we have seen. Now we will see more clearly a rational justification for the identification of water with the primary matter of the formed cosmos with the female from a medical perspective that helps contextualise the Stoic imagery of the relationship of *apoiros ousia* to god and also the idea of water as primary element of material creation.

The transference of information from medicine to philosophy was not one-way of course. Indeed in Edelstein's opinion the medical sect of the dogmatists were

⁵⁵⁰ Cf. page 54 above. By "common place" I mean within a limited educated circle, and not language or ideas that were prevalent in everyday society.

⁵⁵¹ See Van Der Eijk (2005) and Edelstein (1967) Von staden (1989) Garofalo (1988) and Guardasole (1997) for interesting discussions of the relationship of philosophy to medicine.

⁵⁵² Cf. Baldry (1932, pg. 28); "But every anthropologist knows that interest in birth and other phenomena connected with sex is a regular feature of primitive societies long before other aspects of biology are even thought of."

appealing to Plato, Aristotle, the Stoics and “even the Epicureans⁵⁵³” to support their views making the disentanglement of medical and philosophical positions more difficult. Philistion, perhaps the doctor with the most influence, was certainly influenced by Empedocles and his four element theory⁵⁵⁴. In turn it seems likely that Philistion influenced Plato, Aristotle and the Stoics⁵⁵⁵. The Stoics were versed in medical theory as evidenced by Chrysippus’ defence of the placing of the intellect in the heart even when the nervous system had been discovered showing the importance of the brain over the heart and liver. In his defence he appealed to Praxagoras who had flourished about a century and half before, such an appeal displays an interest in medicine that would go beyond mere familiarity. Philistion, and Plato⁵⁵⁶ and Diocles⁵⁵⁷ after him, appealed to the notion of innate *pneuma* and this would no doubt have struck resonances with the Stoics, especially if they had already begun to develop their theories or if Zeno had already become familiar with the theory at the Academy as he might have through the *Timaeus*⁵⁵⁸, then they could have incorporated it into their philosophy that way. However through the eyes of Stoic physics this innate *pneuma* will need something to be innate in. In the cosmic sense we have seen that the *pneuma* is innate in *apiois ousia*. We should not expect the medical parallel to be perfect but to act as a kind of analogue for the cosmic ideas and an analogy we do begin to see even in Aristotle.

In the Hippocratic texts *On the Nature of the Child* and *On Generation* it is said that the woman contributes a seed to the foetus. Both parents contribute to the foetus and the relative strengths of their seed determine what the foetus will be⁵⁵⁹. The weaker the seed then the more likely it is a girl will be produced, the stronger a boy

⁵⁵³ Edelstein (1967 pg. 352).

⁵⁵⁴ Cf. Coulter (1994 pg. 105): “The teachings of Empedocles were developed by the Sicilian school of medicine whose most famous representative was Philistion of Locri.” The Menon Papyrus gives Philistion’s physiology and his use of the four element theory, in Jones (1947) cap. XX: 24. Diocles was also heavily influenced by Empedocles (cf. Phillips 1987, pg. 130).

⁵⁵⁵ The second Platonic letter, which is of dubious authenticity, suggests that Plato and Philistion were well acquainted (Longrigg sees this as a sufficient connection). Also *Timaeus* 82A and 86A reveal a strong input from the Sicilian School of medicine, as pointed out by Coulter (1994). See *Parts of Animals* 646a13-20 for Aristotle. For the Stoic association of one property with each element see DL 7.137 (47B L&S = SVF 2.580, part).

⁵⁵⁶ In the *Timaeus pneuma* is an essential cause of health or sickness and because of this it seems reasonable to see it as innate. Phillips (1987, pg. 127) see the influence of Philistion on Plato as “strong and definite” and it is clear that he held an innate *pneuma* and so it is likely that such a position was passed on to Plato.

⁵⁵⁷ Cf. Phillips 1987 (pg. 128).

⁵⁵⁸ See note 557 above. Although it may be a tendentious claim we can also speculate that 45b-d - which says that sight is made of fire and that it is the vibrations back down this “fiery stream” to the soul that give rise to sight implies that the soul or at least its relation to its powers is fiery.

⁵⁵⁹ *On the Nature of the Child* 12, *On Generation (The Seed)* 6.

as it will resemble its father more. Despite the early medical opinion that the female is clearly not passive, she contributes her own seed to the foetus, the image of a woman as passive receptacle of the male seed was common: "The image of woman as soil is even more widespread in ancient literature. Man is represented as the farmer who sows the seed, woman as the soil *in which* this is grown.⁵⁶⁰" Popular conceptions, and indeed those in philosophy, do not mirror acknowledged medical opinion⁵⁶¹. Aristotle also briefly contemplates the image of a woman's uterus as an oven, a warm receptacle that nurtures but does not contribute substantially to the bread in it before rejecting it in favour of a more equal contribution to that of the male; he replaces that position with one in which the mother contributes matter. If he can make such an assumption then it seems likely that this was acknowledged medical opinion and imagery of a passive woman was merely for illustrative purposes.

Whatever Aristotle's opinion about the biological role of the woman, and it seems clear that he thought she did contribute something – even if it was just matter – and was not completely passive, it remains that the idea of the woman as a receptacle was a common notion. This clearly does not reflect actual biological or medical views of the time but it is the imagery that concerns us as the woman is identified with the moist for clear reasons. The notion of a "receptacle" or space has, as we have seen, already caused numerous problems of interpretation in Plato but for the Stoics the "moist female aspect" would most likely be seen as explicable in terms of a material principle rather than as a receptacle or space. I do not wish to overstate the importance of the medical views at the time or the biological theories. Perhaps the most important notion to come down to the Stoics is rather the identification of each element with a single power which they took from Philistion. This clearly delineates for rational purposes the elements into active and passive ones in a way that reminds us of the Derveni author's interpretation of myth.

This necessarily brief discussion of medical and biological imagery has shown not that the Stoics were influenced to great degree by doctors but that the imagery and mode of understanding the cosmos has a common origin with medical explanations and

⁵⁶⁰ King (1990, pg. 17).

⁵⁶¹ E.g. Sophocles' *Trachiniai* 31-33 where Heracles' attitude to his wife and children is likened to that of a farmer sowing seeds and returning to the crop. In Aeschylus *Oedipus* is reported as having "sowed his seed in a hallowed field." Herodotus 5.92 describes the necrophilic act of the tyrant Periander of Corinth as "putting his loaves into a cold oven."

imagery. The imagery of man as a microcosm helped the Stoics explain the workings of the macrocosm in familiar language. Unfortunately the imagery seems to have got in the way of the message they were trying to explain with the result that Stoic physics has been somewhat misunderstood. The pre-Socratics furnished the language and method of natural physics which the Stoics adopted and updated so that for the next five or so hundred years Stoicism became the *lingua franca* of science regardless of personal allegiance. The biological imagery adopted by medicine from pre-Socratic philosophy in parallel to the Stoics also reinforces Zeno and his followers as very much the product of their age and displays a willingness, if not eagerness, to make their natural philosophy as accessible as possible to all, in contrast to what I have to be the secretiveness of Plato.

What this part of the chapter and thesis has shown is not really the material principle *qua apoios ousia* but how, *qua* material principle, it actually relates to the world. As *apoios ousia* the material principle is simply that: a principle. It is explanatorily purposeful but it cannot *do* anything itself. Unformed substance by itself is incapable of anything. It explains why things are three-dimensional with resistance, since that is what it is to be material, but god does not make *things* out of *apoios ousia* directly. Although, as we have seen, it is true to say that everything is a combination of the active and passive principles this is not enough. If god is going to make a tree, say, he does not simply manipulate bare *apoios ousia*. Instead there is a process that must be rigidly followed. First *apoios ousia* must be made into a suitable medium for the active principle to act on in the guise of *pneuma*. First it must be "turned into" water as the most suitable element for the others to be made out of; then the other elements are created; then the elements must come together in proportion to make the tree through the inherent direction of god. Then by degrees the requisite laws of nature will ensure the correct combinations of the mixture of active and passive, allowing the active to manipulate the passive not *volens nolens* but in accordance with a strict formula. It is this adherence that ensures the regularity of the world and prevents the spontaneous creation and destruction of the world's parts. *Qua* explanatory principle matter and the material principle is properly understood as *apoios ousia*. *Qua* "out of which" matter is properly speaking water, from which the rest of the elements are subsequently produced, and so the position is no more revolutionary than Empedocles' elemental theory since all objects in the world are combinations of the elements according to rigid formula and laws of transmutation

which exist at the microscopic as well as macroscopic level. The idea of the two principles that exist just preceding the cosmos' creation being the creative spark of fire that remains⁵⁶² and water reinforces the Stoics' relationship to their predecessors, and especially to Heraclitus: everything is from opposites and from the alteration between them.

⁵⁶² Cf. DL 7.135-6 (=L&S 46b = SVF 1.102, part) which likens god to a sperm enveloped in water which he then manipulates.

Conclusion:

This thesis has proposed a link between the geometrical atomism and abstract metaphysics of Plato and the Old Academy and the Stoics' *apoiros ousia*. It has argued that the Stoics continued a process of reduction, simplification and rationalisation of the formal metaphysical hierarchy that began with Plato himself. This account is not definitive, and there may be aspects that have not been taken account of or explored to the full satisfaction of the reader. However a definitive account could not be hoped for owing to the subject, the space available and the paucity of definitive evidence for the views of the early Stoics and Old Academy. The most that could be hoped for is, as Timaeus would say, a likely account.

The first chapter proposed an interpretation of the interaction of the two Stoic principles that rendered comprehensible their notion of total blending and set the scene for the ultimate reduction of forms to an immanent existence in the sensible world. The second chapter examined the relationship of the *Timaeus* to matter. We looked at the possible candidates for a material principle and concluded that if there is such a candidate in the *Timaeus* it is inaccessible without some other knowledge. With this in mind attention shifted to the *Parmenides* and *Philebus* and it was argued that these two works provided a new interpretation of the formal realm. It was then argued that the way that the formal realm was understood to exist was directly mirrored in the sensible world and that the atomistic picture suggested in the *Timaeus* was thus rendered more coherent. The Unwritten Doctrines were included in the discussion to add more detail to the emerging picture of creation from opposites and helped to place the interpretation of the Old Academy which followed into more context. The metaphysics of Speusippus and Xenocrates were seen to be following in the footsteps of Plato. They built on the later metaphysics of Plato and it was their simplification of the metaphysical system that formed the background out of which the Stoic principles would grow.

At the start of this thesis many options for the main influence on the Stoics' development of their theory of matter were suggested. Plato, Aristotle, the Old Academy, Heraclitus and the medical writers of the time were proposed as influences and their relationship to the Stoic theory of *apoiros ousia* was looked at throughout the thesis. All of these sources have a part to play in the development of Stoic

physics. However the major influence on the early Stoics was undoubtedly from the Old Academy. The cultural and intellectual background of the times was most likely influential in the formation of the Stoa; however there is no reason to suppose that the medical, mythical or even pre-Socratic background was a strong direct influence on the formation of the Stoics' material principle in the way that the Old Academy and Plato were. What I have endeavoured to show is how the seemingly incompatible positions of the Old Academy and the Stoics are actually quite closely related; and that if it had not been for the rigid, formal, mathematical, metaphysics of Plato then the Stoic notion of *apoiōs ousia* could well look very different. The contribution of this thesis to the contemporary debate on Stoicism, ancient physics, Platonism and the importance of the Old Academy is, I hope, clear. I have attempted to show Plato's late ontology to have been markedly different from his earlier theory; to extend the understanding of this to the metaphysics of the Old Academy; and ultimately to show how Plato's late ontology became the basis for Stoic physics. The Stoics came from the Academy and the relationship of their active principle to their passive principle shows this as does the very nature of that most un-Platonic of things: the material principle of the sensible world *simpliciter*.

The Stoic account of their material principle is fairly straightforward and fits in with our modern conception of what a material principle should be. They describe a substance that in and of itself is without any individuating properties. It exists, in theory, as a bare extension and is responsible for the extended nature of all objects in the world. We saw how its passivity and unchanging nature are its key attributes and that it never exists alone as prime matter. Instead it always exists conjoined with the active principle and as a result is always informed. At some times it exists as fiery, at others as the world. When the world is to be created from the fiery state all that is fiery must first become water. The Stoics seem on some level to maintain the tradition that water is the *primary* matter of the world. This is most likely because it is in opposition to fire which is the active principle in the world.

The Stoic account of *apoiōs ousia* makes it a three-dimensional continuum. It is not built up from anything and is not reducible to anything. All parts of it are instead infinitely divisible so that each spatial block of it can be divided infinitely; converging on but never reaching the infinite. The Stoics' characterisation of *apoiōs ousia* in mathematical terms along with this mathematical explanation of its nature

demonstrates their interest in mathematics and debt to the mathematical teachings of the Old Academy. The hypothesis of this thesis was that the precursor to *apoiros ousia* could be found in Plato's late ontology and that it was transferred to the Stoics via the Old Academy; yet on a traditional interpretation of Plato there does not appear to be anything that resembles the Stoics' *apoiros ousia*.

The *Timaeus* was taken as the starting point of explanation of Platonic matter. However it was shown in chapter two that the two candidates for matter in the *Timaeus*, the Receptacle and the elemental triangles, are inadequate on their own to explain Platonic matter. It was argued that just as the objects in the sensible world are imitations of forms, so too the matter of the sensible world will be an imitation of a matter that exists at a higher level. To understand the material principle of the sensible world, it was argued, we must first interpret and understand matter at the metaphysical level. It was with this in mind that the discussion moved from the physical realm to Platonic metaphysical speculation. The analysis of the second half of the *Parmenides*, *Philebus*, and Unwritten Doctrines showed us not only a mathematization of metaphysics but also explained the way the sensible world relates to the formal and why the sensible world is an imperfect image of it. The picture was seen to involve creation through opposites and by necessity. Just as the Stoics have the active and the passive so Plato has the One and Multiplicity. It is the One of the second hypothesis of the *Parmenides* that is the important start of speculation for Plato.

This One, we saw, was because of nothing other than Being. Being and the One were different by nothing other than the Different. These three things, by the simple necessity that something is, create multiplicity. From the interaction of 2 and 3 the ideal numbers are created. Their creation is made possible by the limiting of the multiplicity that comes about from the interaction of 2 and 3, by a new One₁. However the limiting of this stream of multiplicity, to, I would suggest, the decad, also creates a series of monads by virtue of the fact that each ideal number is itself one. This is in turn yet another stream of multiplicity and is limited again by a One₂. This limiting creates the mathematical numbers, those things that exist as single and multiple. It is at this level that the forms were seen to exist. They were seen in chapter 3.1.2 to consist of both one and many in their natures. Somehow - the explanation was not forthcoming in either the texts or in the Unwritten Doctrines -

the mathematical level also “overflows”. This creates the geometrical level. This multiplicity, which, rather than the mathematical monads of the previous level, must be made of geometrical points is limited by the imposition of the One_3 . The geometrical level is, thus, an image of the mathematical level which is in turn an image of the ideal level which is in turn an image of the One. Each metaphysical level is more removed from the One itself and hence also from Being. The interpretation of Plato’s late ontology offered in this thesis shows matter to be the unlimited multiplicity. It is unlikely that Plato thought this was a process which had a beginning in time. More likely the multiplicity is constantly limited by the One. The two are never separate. This is one connection to the Stoic principles, and clearly predates Aristotle’s discussions of matter.

This picture was seen to be consistent with that found in the *Timaeus* and offered the key to understanding the notion of matter in that dialogue. The Receptacle was rejected as matter on the basis that it was space, but the question still remained of what it was space for. It was suggested that the Receptacle is three-dimensional because of the presence of the four elements in it. But the nature of the elements as geometrical figures required explanation that was not available in the *Timaeus*. The metaphysical picture from chapter three furnished the explanation of the nature of the sensible world. Again, just as it is unlikely that Plato thought of the metaphysics having a beginning, it is unlikely that he thought the sensible world began to exist at some point. Rather the metaphysical necessity of “emanation” explains the formal realm and the sensible is an inescapable fact. Just as the geometrical level was seen to consist of the multiplicity of geometrical points being limited into geometrical figures, so too this picture is repeated at the sensible level. The sensible level, given the explanation of the elements as three-dimensional geometrical figures, mimics the geometrical level. The sensible world’s matter is then a multiplicity of sensible points limited according to a One_4 , who is perhaps god – the demiurge or giver of form. God plays a game of cosmic join the dots in imitation of the limitations of the multiplicities at the levels above. The reason the sensible world is such a poor imitation and not a fit object for knowledge is the distance it has from the original One. It is also a three dimensional representation of “formulae” that exist more properly at the mathematical or ideal level.

This picture from Plato's late ontology lays the foundations for the Stoics to build upon. He has given them a matter that is infinitely divisible, a continuum, devoid of properties (apart from those associated with points) and the constant conjunction of active to passive.

Xenocrates, we saw from 3.3.-3.3.3, followed Plato quite closely. The main concern for him was that he did not see how points, being nothing in themselves, could "come together" to create the world. A multiplicity of nothings is still nothing. To avoid this problem we saw, in 3.3.3, his account of perception and his positing of minimal lines. It is unlikely that these minimal lines had a definite length that could be known.

The lines have an advantage over points because they have some extension and so an infinity of these will result in something: the aggregate of something is something. But we also noted Xenocrates' appeal to intrinsic motion in the sensible world. The minimal lines are lines and all lines are still made of points. The lines are sustained by the inherent motion of the sensible world - the pre-cosmic shaking of the *Timaeus* comes to mind. Xenocrates builds on Plato's picture of the sensible by adding another reason for the inherent imperfection of the sensible world thus reinforcing the need for a formal level which his metaphysics had reduced.

Plato himself and Xenocrates furnish everything that is necessary for the early Stoics to have developed their theory of *apoiós ousía* and account for its interaction with the active principle. Plato's late ontology and the Old Academy were both very mathematical and the conceptions of matter that they employ demonstrate this strongly. The account given of the early Stoics' interest in mathematics was highly speculative. To move, for example, from Chrysippus' explanation of the cone paradox to the very substance of the sensible world may be seen as a speculation too far. But the Stoics are materialists and at the end of the day if Chrysippus' explanation of the cone paradox is genuine then it will apply to the sensible world in general as much as to the cone in particular. The cone is, after all, just as sensible as anything else.

While mathematics had no doubt fallen from the exalted position it had enjoyed at the Academy it is likely that it was still a serious subject for philosophers. We know that several Stoics wrote books on Pythagoreanism, that Zeno was educated at the

Academy, and that Chrysippus responded to mathematical paradoxes. We also saw Long's argument that Stoic language is peppered with mathematical terms. There seems to be substantial circumstantial evidence to suggest that it is likely that mathematical considerations would have played a not insignificant role in the development of Stoic thought in general; and there is even better reason to believe that they played a significant role in the codification of the nature of their material principle. As such the fact that Platonic and Old Academic matter is primarily mathematical in nature only reinforces the suitability of these conceptions of matter as the primary influences on the Stoic development of their material principle.

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List of Abbreviations:

DCMS	Iamblichus's <i>Concerning the General Science of Mathematics</i>
<i>De Gen. et Corr.</i>	Aristotle's <i>On Generation and Corruption</i>
<i>Div.</i>	Cicero's <i>On Divination</i>
DL	Diogenes Laertius <i>Lives of Eminent Philosophers</i>
E&K	Edelstein and Kidd
FHS&G	Fortenbaugh, Huby, Sharples, and Gutas
<i>Fin.</i>	Cicero's <i>On Ends</i>
IP	Isnardi-Parente
KRS	Kirk, Raven and Schofield
L&S	Long and Sedley
<i>Metaph.</i>	Aristotle's <i>Metaphysics</i> .
<i>Parm.</i>	Plato's <i>Parmenides</i> .
<i>Rep.</i>	Plato's <i>Republic</i>
<i>SVF</i>	<i>Stoicorum veterum fragmenta</i>
<i>Tim.</i>	Plato's <i>Timaeus</i> .
<i>Tusc.</i>	Cicero's <i>Tusculan Disputations</i>