

# Towards understanding Stoic Influence on Jesuit Mechanics: Bellarmine's Louvain Lectures

## 1. Introduction

### 1.1. Bellarmine's Rejection of Aristotle's Cosmology

Baldini & Coyne<sup>1</sup> have rightly argued that the Louvain lectures on Genesis, delivered by the young Jesuit Robert Bellarmine in the period 1570-1572, constitute a rejection of Aristotelian cosmology half a century before a rejection on similar grounds in Christopher Scheiner's landmark *Rosa Ursina*.<sup>2</sup> Non-Aristotelian features to be found in Scheiner's *theoria*, the final section of the *Rosa Ursina*, include the following:

- a) the heaven is composed of a fluid material
- b) the material does not transport the heavenly bodies around the earth; rather, the heavenly bodies move through this material

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1. Baldini & Coyne (1984): I have not had access to the Louvain lectures which are mostly unpublished and still in manuscript form, but the extracts provided by these two scholars shed much light on Bellarmine's use of non-Aristotelian cosmological notions.
  2. In fact, even Bellarmine was on one point anticipated by Jean Pena (1528-58) in his edition of Euclid's *Optics and Catoptrics* published in Paris in 1557. He too posited a single medium, in his case air, extending from the earth up to and including the heavens, although his motive was partly in order to explain an optical phenomenon; see Barker (1991) 143 and n. 27, who rightly concludes that Pena drew his notion of air from Cicero, *De Natura Deorum* II. Pena's cosmic *pneuma*, however, should not be confused with the firmament of fire advocated by Bellarmine (Barker, 146: "Within two decades the same doctrines reappear in another tradition where cosmological ideas were a matter for dispute — the tradition of commentators on Genesis."). Bellarmine's reference to the same source, Cicero, *De Natura Deorum* II, this time to testify that all the Stoics regarded heaven as fire, does not suggest that cosmic *pneuma* and heavenly fire are equivalent. On the Posidonian distinction between *pneuma* and fire, see esp. p. 23 below; on Posidonius as a source for Cicero, *De Natura Deorum* II, see n. 108 below.

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- c) both the heaven and the heavenly bodies are made of fire
- d) heavenly material obeys the same laws of physics as earthly material.<sup>3</sup>

Similar features are to be found in Bellarmine's Louvain lectures. What is most interesting is that the early lectures pertaining to cosmological issues antedate the 1572 Nova and the subsequent celestial phenomena which might otherwise have been considered sufficient reason for advancing a non-Aristotelian cosmological theory. Recently observed irregular occurrences in the heavens were not the reason for Bellarmine's break with Jesuit tradition.<sup>4</sup> As Baldini & Coyne, commenting on extracts from the Louvain Lectures, observe, Scheiner himself (*Rosa Ursina*, 733) states that Bellarmine had based his thesis "not on human understanding but on the divine word, not on his personal opinion but on the common thought of the Fathers, not on a sudden impulse but on the experience of a life of study carried out for many years; and he did this fully aware that he was acting against that torrent of the teaching of the Schools which dragged along with itself into error the mathematicians, who seek to resist since they are inclined to a judgement altogether the opposite."<sup>5</sup>

### 1.2. Bellarmine's Authorities

Bellarmino's reliance on the divine word and the Church Fathers is admirably demonstrated in the Louvain Lectures, although Scheiner did not have these in mind when he made his comment.<sup>6</sup> In

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- 3. See Baldini & Coyne (1984) 3-4.
  - 4. Grant (2003) 128-129 (cf. 135-136) asserts that the arguments used in the attack against "the traditional Aristotelian concept of an incorruptible and unchanging celestial region and against the well-established belief in the existence of hard celestial orbs" ... "were based on Tycho Brahe's naked-eye observations of the New Star of 1572 and the comet of 1577 and on Galileo's telescopic observations of the planets."
  - 5. Baldini & Coyne (1984) 27 n. 5 (their translation); they add, "In fact Cesi wrote to Faber (p. 731) that Bellarmine had told him that he had not divulged his astronomical ideas 'because of the opposition which the Schools usually raised.'" On Cesi, see next note.
  - 6. Scheiner refers not to the Louvain Lectures, but to other evidence for Bellarmine's views, namely his *De Ascensione mentis in Deum*, letters to JR Ziegler and S Heiss, and especially his entire

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the lectures, Bellarmine seems to go out of his way to emphasize his break with Aristotelian tradition. On the question of the corruptibility of heaven (*coelum*) for example,<sup>7</sup> he says: "Two opinions there are on this question. One is of St. Thomas and of many scholastics and of almost all the Peripatetic school... The other is of almost all the Fathers." One of the early Greek speaking Fathers, Basil, "presents the opinion of Aristotle about the fifth nature and makes fun of it." After surveying the opinions of several other Fathers, Bellarmine uses the authority of the Venerable Bede to introduce the support of the philosophers, again pointedly excluding Aristotle: "Bede on the first chapter of Genesis wants this [opinion] to be not only of all the Fathers, but of all the philosophers, the school of Aristotle excepted."<sup>8</sup> Bellarmine goes on to refer to Plato's *Timaeus* and the (neo-)Platonists. Finally he turns to the Stoics, all of whom, he says, believe that heaven is fiery. He cites as his sources for this remark about the Stoics both Cicero,<sup>9</sup> *De Natura Deorum* II and the Neoplatonist, Macrobius, *Commentarii in Ciceronis Somnium Scipionis* II. Having noted that even some Aristotelians advocate

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correspondence with Prince Federico Cesi from which he quotes extensively: see Baldini & Coyne (1984) 4.

7. Baldini & Coyne (1984) 9, with which their series of extracts from the Louvain Lectures begins (all translations from the Latin are mine, unless otherwise stated).
8. Baldini & Coyne (1984) 31 n. 13 comment that Bede nowhere says this in his writings on Genesis.
9. Two major Latin sources for Stoic thought are Cicero and Seneca. They are both often regarded as eclectics; see e.g., Barker (1991) 137. Cicero actually practised Academic scepticism, the attainment of which was reached by pitting one doctrine against an equally persuasive rival doctrine; thus his philosophical works present Epicurean doctrine against Stoic, Academic methods against Antiochian, etc., with one position perhaps appearing "similar to the truth" but no more than that (Cicero's preference for the Stoic position in *De Natura Deorum* III. 95 is treated as an indication of eclecticism by Barker, 140); on Cicero's *De Natura Deorum*, see n. 108 below. Seneca considered himself to be Stoic. His "letters" attempting to persuade an Epicurean, Lucilius, to cross over to Stoicism contain Epicurean arguments, but that is a well-known dialectical technique; his *Quaestiones Naturales* is entirely Stoic (very often Posidonian) in outlook.

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the second opinion (that heaven is corruptible), thus further undermining the position of Aristotle,<sup>10</sup> Bellarmine continues his survey of the authorities by stating that the Scriptures themselves bear witness to the heaven being corruptible. No verses are cited in support, but Bellarmine rounds off the subject with two verses apparently supporting the view that the heaven will not be completely corrupted. These may be added to the two verses already provided in support of the view of Thomas which Bellarmine gave at the beginning of the topic. In other words, four Biblical verses are cited apparently in support of the incorruptibility of heaven, and none against. This, however, is but a rhetorical ploy; a dozen verses indicating corruptibility are provided in the very next section, on the question whether heaven will in fact be corrupted.<sup>11</sup> The last of these verses, II Peter, 3, finally combines the dissolution of the heavens (and of the elements) with their destruction by fire. The connection between the corruptibility of the heaven and heaven's fiery nature had not been made explicit in the previous section.

This brief survey of the way the early Bellarmine treated two questions in his Louvain lectures supplements Scheiner's observation that the later Bellarmine based himself on the Bible, on the Fathers, and on the philosophers other than Aristotle. Bellarmine's motive was clearly to uphold the truth of the scriptures rather than assert a new cosmological theory based on personal observation. However, it is clear that Bellarmine's reading of the Fathers and the philosophers influenced his understanding of the diverse or vague Biblical cosmological accounts. For example, despite the emphasis on water in the creation story in Genesis, Bellarmine regards the heaven as fiery, since this is the almost universal view of the Fathers and philosophers, and has some support in the New Testament.

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10. Baldini & Coyne (1984) 9: Bellarmine gives as examples Philoponus, Avicenna and Avencebrol; they were indeed influenced by Aristotle to some extent, but they were also influenced by Neoplatonists and others, and are hardly representative of Peripatetics.
  11. Baldini & Coyne (1984) 11, and 32, nn. 20-31: Job 14:12; Ps. 102:26, 27; Isaiah 34:4, 65:17; Joel 4:16; Matt. 24:35, 28:20; Rev. 6:14, 21:1; II Peter:10-13; some additional references are inaccurate, cf. nn. 22 and 28.

## The Stoic Connection

### 1.3. The Stoic Connection

It is no accident that the couple of New Testament passages cited by Bellarmine, together with most Fathers, and at least some of the Neoplatonists should all agree on certain points of cosmology. They were all influenced, directly or indirectly and to a greater or lesser extent, by Stoic cosmological views developed in the period 300-50 B.C.E.

Stoic influence on the Jesuits has been widely recognized, but until now the content and manner of this influence, as well as the reasons for this influence, have been confused. The case of Bellarmine in particular shows that Stoic influence was indirect but pervasive. Bellarmine in the Louvain lectures, acting in his capacity as a Christian theologian, expounded Genesis with the aid of New Testament accounts and Patristic interpretations which, unknown to him, contained many Stoic cosmological notions.<sup>12</sup> He was consciously anti-Aristotelian, but only unwittingly Stoicizing.

A further complication in our assessment of Stoic influence on Bellarmine is the fact that there was no one Stoic cosmological theory.<sup>13</sup> This apparent drawback is actually a blessing in disguise, as the differences in cosmological theories help us to outline the development of Stoic cosmology in the Hellenistic period; it is then possible to identify the particular Stoic notions Bellarmine adopted, and the routes by which these Stoic notions were transmitted to Bellarmine, allowing us to assess more accurately the degree and extent of Stoic influence on Bellarmine.<sup>14</sup>

## 2. Developments in Stoic Cosmology

The following brief account is intended to view the development of Stoic cosmology from a perspective which may be new not only to scholars of the modern era but also to researchers in the

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12. Bellarmine gives his lectures in his capacity as a theologian, not as a philosopher or astronomer; e.g. “it pertains not so much to a theologian as to philosophers and astronomers to consider” something which Bellarmine is not going to consider (226v), Baldini & Coyne (1984) 17.

13. The conflation of various Stoic cosmologies leads to the confusions seen so often not only in modern literature but also in our ancient sources. For one such confusion, see n. 2 above.

14. By extension, it will be possible to assess more accurately Stoic influence on other Jesuits as well.

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field of Greek philosophy. It is based on a premiss I have argued elsewhere, that the Stoics never had an organized school headed by scholarchs.<sup>15</sup> Each Stoic teacher was free to develop Stoic philosophy as he saw fit, but as a professed exponent of Zeno's philosophy, each took pains to present his philosophy as an interpretation of Zeno. Stoicism was not an orthodox system with heretical members, but rather a philosophy tending towards integration of its various elements with ever increasing sophistication, somewhat obscured by the false attributions to Zeno of many later innovations. I have found it necessary to consider the contexts especially of Zeno at the beginning and Posidonius at the end of the great period of Stoic innovation in order to sort out the confused testimonies of our fragmentary sources.

### 2.1. Zeno of Citium

Zeno of Citium<sup>16</sup> in Cyprus came to Athens in about 311 B.C.E., a decade after the death of

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15. Karl Gottlob Zumpt's hypothesis, published in 1844, that unbroken chains of scholarchs supervised the four main Athenian schools (the Academy, the Peripatos, the [Epicurean] Garden and the Stoa) from their inception until the closure of the schools by Justinian in 529 C.E. is still widely encountered in secondary literature today. There were, however, no schools for Justinian to close, since the Peripatetic and the Academic schools had come to an end by 80 B.C.E. and the Stoics had never had an organized school with scholarchs and school property in the first place: on Aristotle's school, see Lynch (1972); on the Academy, see Glucker (1978); on the Stoa, see Ludlam (2003).
  16. Not "Cittium". This persistent mistake is one of innumerable errors in historical fact and philosophical interpretation in Colish (1985), although she correctly notes that "it often becomes impossible to detect the head of the school, or even if the school had an acknowledged head" (7).

## Zeno of Citium

Aristotle.<sup>17</sup> He reportedly studied with several philosophers,<sup>18</sup> including Crates the Cynic, Stilbo of Megara, and Polemo the Academic scholar, the heir to Plato's garden near the Academy, the gymnasium north of Athens. Some ten years after Zeno's arrival in Athens, Epicurus began teaching in his own private garden just off the road between Athens and the Academy, no doubt hoping to attract students on their way to the Academy. Soon after, Zeno began teaching in public by the "Painted Stoa". While teaching in public reflects Zeno's Cynic roots, it should also be noted that this stoa was ideally placed on the route taken by potential Academic and Epicurean students out of the agora in the direction of the Academy. Zeno's followers were called *Zēnōneioi*, and it is only later that they or their students acquired the epithet "Stoic".

Zeno seems to have been primarily interested in ethics, but he was the first Greek philosopher to make the formal division of philosophy into logic, physics and ethics, where both logic and physics serve the interests of ethics. His writings on physics amount to one small work, *περὶ τοῦ ὅλου* (*On the whole*),<sup>19</sup> which would have allowed no more than an outline of his general ideas on cosmology.

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17. It is an interesting fact that most of the innovative Stoics originated in the Hellenistic empires around the east Mediterranean basin. Diogenes Laertius describes Zeno as Phoenician, but it would be wrong to jump to the conclusion that all of the Stoics were of semitic stock, or that Stoicism was essentially the development of an oriental cult: see Hengel (1974) II. 59, n. 23, where he summarizes the evidence provided by Pohlenz (1948) for a Semitic origin of Stoicism; cf. Hengel (1974) I. 103-4; and for a recent view, Bryant (1996) 429. The present article shows that at least some basic principles of Stoic physics are deeply rooted in earlier Greek philosophy.
  18. As Sandbach (1985) 13 points out, there is no mention of Aristotle's pupil, Theophrastus (or indeed any other pupil of Aristotle), among the teachers of Zeno. This needs to be stressed because of persistent assertions such as the following by Osler & Panizza (1991) 1-2: "Both Epicurus (341-271 B.C.) and Zeno of Citium (334-262 B.C.) developed their philosophies in reaction to the prevailing schools of Plato and Aristotle which dominated Greek thought at that time." There is little evidence of Aristotelian influence on Stoic thought.
  19. The title of the work does not imply that Zeno was the author of the Stoic distinction between "the whole" (*to holon*), referring to the cosmos as the sum of its parts, and "the all" (*to pan*), referring to

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The major tenet of his ethics is that the wise man should live in accordance with nature. This is now widely understood to mean that just as nature is rational, so too should the soul of man be rational; man's *logos* should reflect the cosmic *logos*. Zeno's cosmology would therefore have shown the rationality of the cosmos.

Later Stoics and doxographers were inclined to attribute all common Stoic notions to Zeno, but given the limited scope of Zeno's physical writings, anything too elaborate should be ascribed to later Stoics. Zeno's own cosmology seems to have followed the tradition of the "natural scientists" (*physikoi*), misleadingly called Presocratics. Ever since Parmenides' analysis, two centuries earlier, of "what is" as changeless, simple and spherical, all philosophers had been obliged to explain how the world of phenomena has multiplicity and change while what actually is is single and unchanging. Of the materialists, some, including Anaxagoras with his roots, or Leucippus, Democritus, and Epicurus with their atoms, had chosen to make the unchanging cause a plurality, effectively positing many Parmenidean spheres; others had chosen to introduce into the one eternal sphere both change and plurality. It would seem that Zeno followed the second course, using at least Empedocles and Heraclitus as models.

The most fundamental Stoic concept is the *ousia*. This is often translated as "substance". It is the Stoic version of the Parmenidean thing which is, in that it never passes away or comes to be, although it is subject to internal change. As one doxography tells us, the *ousia* is not actually divisible, but it may be thought of as having two inseparable principles, the passive and the active. The passive principle may be called matter, and the active principle may be called, among other things, god. God and matter, being two complementary aspects of the whole of *ousia*, are necessarily coextensive, omnipresent and eternal. God acts on matter to create all that exists in the *kosmos*, the universe in its organized state. The *ousia* could be viewed in its active or passive aspect as required, or indeed as a combination of the two.<sup>20</sup> All other particular things existing in the universe are manifestations of the *ousia* in various aspects. Since they come to be and pass away, they cannot be

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the cosmos and the surrounding void: cf. *SVF* II. 522-525.

20. Diogenes Laertius, 7. 134-138

## Zeno of Citium

said strictly to be. All particular things are therefore called “bodies”, rather than “things which are”, and occupy space.<sup>21</sup> A body is any thing which could affect, or be affected by, another body. Examples of bodies might include a man, his soul, and justice. As may be seen by these examples, Stoic bodies can occupy the same space: the soul is co-extensive with the human body, and therefore so is justice, since this virtue is actually the soul in a certain disposition.<sup>22</sup> Thus far Zeno’s account of being and bodies, but he must also explain movement and change.

The fifth-century Empedocles had explained change in what eternally is by positing in addition to four cosmic elements (fire, air, water, earth) two forces acting on these elements: “love” to blend them together, and “strife” to separate them out, in an eternal cosmic cycle from complete blending to complete separation and back again. The entire sphere of the cosmos remains filled with all four elements at every stage, together with the predominant force in that stage, be it “love” or “strife”. It would seem from the remains of his poem *On Nature* that Empedocles regarded the current stage of the cosmos in which we find ourselves as the age of “strife” where the four elements are in the process of separating. Zeno posited the same four elements and a cycle of change, but in his version the cycle is not from the complete blending of the four elements to their complete separation and back again, but from the complete rarefaction of the *ousia* into fire to its complete, or almost complete,<sup>23</sup> condensation into earth and back again. Water and air are intermediates in the process, water being more condensed than air,<sup>24</sup> and of course, during the transition from one extreme to the other all four

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21. Many testimonia on the Stoics refer to “things which are” (*ta onta*) but this slip of the pen may be ascribed to the fact that every other Hellenistic and later school of thought referred to things as *onta*.
  22. God and matter *per se* were not considered bodies but principles, the active and passive aspects of the *ousia*.
  23. Perhaps the condensation was not total since god and the cosmic soul, deemed by Zeno to be eternal, were composed of fire.
  24. The idea of condensation and rarefaction of one element into the others is early in the history of Greek philosophy. Anaximenes of Miletus in the sixth century B.C.E. regarded air as the source for the other elements by this method.

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elements can exist at the same time. Our cosmos is currently in the process of returning to fire.<sup>25</sup> While Empedocles required two causes of movement, “love” and “strife”, Zeno posits only one; it seems to be something akin to Anaxagoras’ *nous* (“mind”), a one-time cosmic force which sets off the whole of motion. Zeno seems to have called this one-time force *nous* and *logos*. At the moment when all is fire, god the active principle of the *ousia*, mingles with matter the passive principle to produce the seeds of reason (*spermatikoi logoi*), which gradually come to fruition throughout the entire cycle until the next conflagration. That is to say, *logos* sets off the whole of motion which then continues in prescribed ways because of the seeds of *logos*. For example, it is necessarily the case when the *ousia* is completely condensed into earth for the earth to begin to give off vapours that will become water and air and eventually fire. The seeds of reason inherent in it make it so. We could say that these are the laws of physics. The cosmos is in this sense fully rational, but this does not seem to have been enough for Zeno.

Zeno’s ethical prescription, to live in accordance with nature, seems to have meant living according to reason. The individual’s reason (*logos*), however, happens to include self-awareness, and his *logos* is located in his soul. It may have been in order to reinforce the parallel between the individual and the whole that Zeno posited a cosmic soul to parallel the human soul. Souls of all living beings were considered to be composed of creative fire<sup>26</sup> emanating from the living body.<sup>27</sup> The ruling principle of the soul was situated in the warmest part of the living body, which in the case of animals tended to be the area around the heart; from here the soul would send out its commands to the rest of the living body. Zeno is said to have located the ruling principle of the cosmic soul in the outer sphere of the cosmos, namely *ouranos*, or heaven, but this may be one of the attributions of later

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25. The complete reversion of the *ousia* to fire is called the *ekpurōsis* or “conflagration”.

26. Stobaeus, *Ecl.* I. 25, 3 (= *SVF* I. 120) reports that Zeno distinguished between two types of fire: the uncreative type which turns fuel into more uncreative fire, and the creative type which nourishes, as in plants and animals; creative fire is in these contexts nature and soul; cf. Cicero, *Tusc.* I. 19 (= *SVF* I. 134): *Zenoni Stoico animus ignis videtur*. Diogenes Laertius 7. 157 (= *SVF* I. 135) attributes to Zeno the Posidonian view that soul is warm *pneuma*.

27. *SVF* I. 139, a view shared by Cleanthes.

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followers bringing Zeno into line with their brand of his philosophy. Cleanthes, Zeno's rather slow-witted pupil<sup>28</sup> who faithfully<sup>29</sup> expanded on a great deal of Zeno's philosophy, located the ruling principle of the cosmic soul in the sun, which he clearly regarded as the warmest part of the cosmos, and this would most probably have been Zeno's view too.

As Keimpe Algra has well observed,<sup>30</sup> most of Zeno's pupils seem to have been as little interested in physics as Zeno was, with only Cleanthes and Sphaerus spending significant effort on working out Zeno's cosmology, although their main interest too lay elsewhere.

### 2.2. Chrysippus of Soli

The work of expanding and refining Zeno's philosophy was continued by one of Cleanthes' pupils, Chrysippus,<sup>31</sup> although it might be more accurate to say that he radically modified Stoic philosophy while attributing his innovations to Zeno.<sup>32</sup> His vast output covered problems in every field of enquiry, and he was clearly a dialectician of some skill. He did much to integrate logic, physics and ethics more tightly and coherently, but occasionally his modifications led to new inconsistencies.

Chrysippus relocated the seat of the ruling principle of the cosmic soul from the sun to the outer sphere, *ouranos*; he may have construed Cleanthes' identification of the hottest part of the cosmos with the sun as an error, while asserting that he himself was merely returning to what Zeno

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28. Diogenes Laertius 7. 170: βραδύς ὑπερβαλλόντως.

29. Diogenes Laertius 7. 168: καὶ Ζήνωνι παραβαλὼν ἐφιλοσόφησε γενναιότατα καὶ ἐπὶ τῶν αὐτῶν ἔμεινε δογμάτων.

30. See Algra (2003) 29-30 for details of writings.

31. The report in Diogenes Laertius 7. 179 that Chrysippus was the pupil of Zeno may reflect the relative importance attached to these two philosophers at the expense of Cleanthes; cf. Ludlam (2003) 50.

32. Not for nothing was Chrysippus known as the second founder of Stoicism. Many of his modifications were no doubt due to the pressure of hostile criticism from rival philosophers, but he seems to have had a lively and enquiring mind in his own right.

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had actually intended. The relocation indicates an awareness that the sun's perceived heat was due to its relative proximity to the earth. If the elements of earth, water and air were gradually returning to fire, the ultimate recipient of all this fire would be the *ouranos*. Chrysippus must have realized that this outer sphere would therefore be far hotter than the sun, and made the relocation of the seat of the soul accordingly. The fire in this outer sphere was called *aithēr*, and Chrysippus is said to have located the ruling principle in the purer part of it.<sup>33</sup>

Contemporary medical theory posited a soul composed of *pneuma*, warm breath. As we learn from Chrysippus' own writings, an animal's soul is a mixture of fire, deriving from blood, and of air, drawn in during the act of breathing. The theory explained not only the reason for breathing, but also the cause of fever (due to an excess of fire in the psychic mixture) or the occasional lack of sensation (due to an excess of air).<sup>34</sup> There is a hint that Cleanthes (and by default, Zeno) had already regarded *pneuma* as the means by which the ruling principle of the soul (creative fire) affected the person's body. According to this testimony, Chrysippus seems to have argued for a soul made entirely of *pneuma*, so that it is the ruling principle itself which pervades the body.<sup>35</sup>

For the sake of consistency, Chrysippus should have regarded, and I suggest did regard, the cosmic soul as entirely *pneuma* as well. The presence of air in the *ouranos* would have presented no problem. Vapours from the earth and water at the centre of the cosmos could have nourished the Chrysippean pneumatic cosmic soul just as easily as Zeno's cosmic soul composed of creative fire.<sup>36</sup>

Furthermore, the perceived elasticity of air caused Chrysippus to utilize air and *pneuma* to

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33. Diogenes Laertius 7. 139.

34. *SVF* II. 787.

35. *SVF* II. 525 = Seneca, *Ep.* 113, 18: *inter Cleanthem et discipulus eius Chrysippum non convenit quid sit ambulatio: Cleanthes ait spiritum esse a principali usque in pedes permissum; Chrysippus ipsum principale* ("Between Cleanthes and his pupil Chrysippus there was a disagreement about what was walking: Cleanthes said that it was *pneuma* sent from the ruling principle to the legs; Chrysippus said that it was the ruling principle itself"). Note that even an abstract activity such as walking needs to be explained in concrete terms in Stoic philosophy.

36. Many scholars conflate Zeno's cosmic fire with later Stoics' *pneuma*: e.g., Barker (1991) 138.

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explain the existence and characteristics of compound bodies. According to this theory, currents of (warm) *pneuma* and (cold) air hold the parts of a compound body together by means of “tension” (*tonos*) and thereby preserve its internal unity; they also constitute the permanent state (*hexis*) of the body and provide its other characteristics as well, such as hardness and brightness, heat and cold. The cosmos itself is unified by all the *pneuma* and air pervading it.<sup>37</sup>

It is unclear whether Chrysippus himself noticed the flaw which was introduced into the system along with the sophisticated modifications. His cosmic soul was no longer purely fire, but *pneuma*, a compound of fire and air, and this meant that it could not exist during the conflagration, precisely the time when god in his purest form was sowing the rational seeds for the next cosmic cycle. Could god exist without a soul? Could there be *logos* without a soul?

### 2.3. Posidonius of Apamea

The potential death of the cosmic soul in the conflagration may have been one of the reasons why at least one Stoic<sup>38</sup> of a subsequent generation, Panaetius of Rhodes, denied the conflagration altogether, advocating instead an eternal cosmos.<sup>39</sup> It is all the more significant, therefore, that

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37. Alexander of Aphrodisias, *De Mixtione* p. 224, 14 (Bruns = *SVF* II. 442) understood Chrysippus as explaining the existence of any body whatsoever by the agency of *pneuma*. He objected that if *pneuma* were the cause of existence, then its constituent parts, fire and air, could not exist. It seems, however, that for Chrysippus, elements *per se* were simple manifestations of the *ousia* requiring no reason for their cohesion, existence, or characteristics.

38. See n. 56 below.

39. Panaetius had studied in Pergamon with the grammarian Crates of Mallos; in Athens, he studied with Diogenes of Babylon (died 151), a pupil of Chrysippus; he also associated with a pupil of Diogenes, Antipater of Tarsus (died perhaps as early as 137, although his death is usually put at 129); see Ludlam (1997) 146-151. Panaetius appears to have been made a priest of Poseidon Hippios in the Rhodian city of Lindos around the middle of the second century, implying that he did return to Rhodes at least once. In 144 he went to Rome (as had his teachers, Crates of Mallos and Diogenes of Babylon), where he became a member of the intellectual circle patronized by P. Scipio Aemilianus

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Posidonius of Apamea, a pupil of Panaetius, reverted to advocacy of the conflagration. Posidonius is one of the most prominent figures in Stoic philosophy, and his role in the development and transmission of Stoic philosophy to later thinkers such as Bellarmine cannot be overestimated. It will, however, be necessary to reinstate Posidonius as a Stoic before assessing his function as the disseminator of Stoic doctrine, after which we may also reappraise his contribution to Stoic cosmology.

While recent literature considering Stoic influence on later science has identified Posidonius as an important factor, doubts have been expressed whether he should be considered a proper Stoic. As Taub says in her book, *Ptolemy's Universe*:

... the possibly important influence of Posidonius on Ptolemy would not necessarily qualify for the label "Stoic." Rist has hinted that Posidonius frequently 'misunderstood' the original Stoic doctrine. Edelstein went so far, when speaking of Posidonius' physical system, as to remark that "compared with the general Stoic system it is heretical". He pointed to the influence of both Plato and Aristotle on Posidonius....<sup>40</sup>

Rist and Edelstein are Classical scholars. Indeed, Edelstein was one of the editors of the standard edition of fragments and testimonia of Posidonius finally brought out by Kidd. A reappraisal of the status of Posidonius is therefore required not only in post-Classical, but also in Classical studies, where the notion of an orthodox Stoic school is still strong. Posidonius is noticeably different from earlier well-known Stoics not only because he taught in Rhodes rather than Athens, but also in that he was a scientist as well as a Stoic philosopher. Earlier Stoics may have investigated epistemology and physics, but they are not renowned for their enquiries into nature as such, although they enquired enough in order to be able to explain the rational working of the universe as a basis for

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(Africanus Minor). He accompanied this Scipio on his mission to the east, travelling to Egypt, Syria, Pergamon and Greece (140-138). He consequently divided his time between Rome and Athens. It was in Athens that he died in 110.

40. Taub, (1993) 15.

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their ethics. Posidonius, on the other hand, was the leading intellectual of the first century B.C.E., and a polymath whose interests ranged from oceanography all the way up to astronomy, from ethnography and history to mathematics, not to mention other fields more usually associated with Stoicism, such as language, politics and ethics.

Why Posidonius was a scientist, why he taught in Rhodes, and why, despite these two apparently un-Stoic features he was still a Stoic, all need explaining. I shall attempt this with a brief outline of his life. The biography presented here will differ somewhat from the usual account of his life, in which Posidonius becomes a Stoic in Athens and then inexplicably moves to Rhodes and begins teaching there.

Posidonius was born around 135 B.C.E., give or take up to eight years,<sup>41</sup> in Apamea, a Macedonian colony and a major military recruitment centre for the Seleucid Empire, one of the Macedonian kingdoms carved out of Alexander the Great's short-lived empire. Whether of Macedonian descent, or of local Syrian-semitic stock, Posidonius would have had a basic Greek education. It is likely that he was brought to Rhodes at quite an early age, possibly by his parents. Rhodes was still a prosperous commercial and maritime base, useful for the Romans whose influence in the East was growing; the Roman republic had only recently acquired mainland Greece and the kingdom of Pergamon in Asia Minor (on the west coast of present-day Turkey).

An unusual development a few years before Posidonius' birth had led to Rhodes becoming one of the intellectual centres of the world. To the south, in Egypt, the monstrous Ptolemy VIII had expelled the intellectuals of Alexandria in 145/4, while others had simply escaped, all to the great benefit of the islands and towns absorbing them. No longer receiving a royal patronage, these intellectuals were obliged to teach what they knew for their living.<sup>42</sup> Some of them settled in Rhodes.<sup>43</sup> After the death of Ptolemy VIII in 116, many may have been attracted back to Alexandria where they had much better facilities, such as the Great Library, and may have expected a better standard of

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41. The canonic dates for Posidonius are 135-51 B.C.E., based on flimsy evidence.

42. Athenaeus IV 184C; cf. *ibid.* 174D-E; Diodorus XXXIII 6-6a, 20; Justinus XXXVIII 8. 6.

43. Strabo XIV 2. 13; Athenaeus XI 489.

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living. If there were intellectuals of such high calibre in Rhodes from 145 to at least 116, Posidonius would have been able to study with some of them in Rhodes until about the age of 20 (give or take up to eight years), if indeed he had moved to Rhodes at an early age.

The presence of Alexandrian intellectuals teaching in Rhodes in the early period of his life, coupled with Posidonius' mathematical abilities which he must surely have acquired at an early age, suggests that Posidonius did indeed come to the island while still quite young and that he studied with some of the Alexandrian scholars. There is some textual evidence hinting at an early education at least in geometry. The second century intellectual and physician, Galen, notes that Posidonius was the most scientific (ἐπιστημονικώτατος) of the Stoics because of his training in geometry,<sup>44</sup> and that having been brought up (τεθραμμένος) in geometry, he was more in the habit than other Stoics of following proofs.<sup>45</sup>

Posidonius was taught by Panaetius of Rhodes. Panaetius is usually considered to be the seventh head of the Stoic school in Athens, which requires Posidonius to have studied there,<sup>46</sup> and it is posited that after his studies in Athens he became a heretic and moved to Rhodes. This conventional view fails to address the problems it raises: Why would Posidonius abandon the Stoic school in Athens? Why would he move to Rhodes of all places to set up his own school? How would he have mastered a different tradition of science (as practised in Alexandria), in a number of fields, after his Stoic education in Athens?

That Panaetius was a Rhodian is surely no coincidence. He may first have met Posidonius in Rhodes where Posidonius had been living for some time. This would do away with the problems outlined above. Posidonius could have studied with scientists from an early age until at least 116 when the Alexandrian exiles may have begun to return home. Stoic philosophy, providing the

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44. *De Placitis Hippocratis et Platonis* VIII 652 = Kidd (1989) I T84.

45. *De Placitis Hippocratis et Platonis* VIII 390 = Kidd (1989) I T83. On the difference between Alexandrian science and Athenian philosophies, see Glucker (1998).

46. E.g., Kidd (1989) II 12: “[Panaetius teaching Posidonius] must have been at Athens, where Panaetius was (if not at Rome) from at least 148/7 B.C. ... until his death, c. 110 B.C., having succeeded Antipater as Head of the School in 129 B.C.”

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theoretical underpinnings to science in general, could easily have been grafted onto this once he had been introduced to it by Panaetius, who died in 110 when Posidonius was around 25 years old.

Panaetius was a distinguished Rhodian well connected with the Romans. Becoming acquainted with such a figure may have helped Posidonius establish himself socially in Rhodes, and even make connections in the Roman world. Once Panaetius was dead, Posidonius would have begun his teaching career in Rhodes, and he would have begun to integrate his scientific theories with Stoic doctrines, modifying both in the process. He would probably have continued his study of Stoicism and the various sciences through extensive reading (for which there is much evidence) rather than through personal acquaintance with teachers.

A decade after the death of Panaetius, Posidonius, now aged around 35, give or take a few years, made his voyage around the western Mediterranean. Roman contacts would have been of considerable help here. He had at least one host, in Massalia (Marseilles).<sup>47</sup> It seems likely that he took the land route from Rome to Marseilles, where he investigated Celtic culture, then on down to Gades (Cadiz), where he spent at least a month measuring the tides. With his results, he was able to refute a theory of his older contemporary, the astronomer Seleucus of Seleucia, concerning the influence of the moon on tides.<sup>48</sup> From here, Posidonius seems to have sailed directly to Rome.

The material Posidonius collected on his voyage around the western Mediterranean, together with much learned material from his predecessors, allowed him to produce one of his greatest and most influential works, *On Ocean*, probably soon after his return to Rhodes, perhaps in the late 90's. The Ocean referred to in the title was the body of water external to the Mediterranean which was believed to surround the entire landmass of the known world. The work seems to have dealt with much more than this, however, and Posidonius was able to display great erudition and expertise in geography, astronomy, anthropology and mathematics. It was a major source for the geographer

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47. Strabo, III 4. 17.

48. Seleucus of Seleucia had written on this subject against Crates of Mallos, one of the teachers of Panaetius. See esp. Strabo, III 5. 9 (=Kidd (1989) II. F 218, II 777 (comm. ad loc.)).

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Strabo, who has preserved for us significant pieces of this work.<sup>49</sup>

*On Ocean* was the sort of work which would have made Posidonius famous if he had not been already. It may be no coincidence that he was soon afterwards elected to a Rhodian embassy to Rome, in 87/6 on a highly important mission. It is a measure of his fame that Romans such as Pompey and Cicero would drop in at Rhodes during their visits to the East in order to meet Posidonius.<sup>50</sup>

Posidonius died at some time between 59 and 46 B.C.E. By then, teachers of the main schools of philosophy were becoming commonplace in the more affluent cities of the known world, catering, as usual, to the noble elite. A young man would finish off his education with a few introductory courses in rhetoric and philosophy of various persuasions. Stoic teachers were required to be competent in exposition, and they were greatly assisted by the doxographies<sup>51</sup> which were becoming widespread. Much of our information about Stoic dogma from Zeno down to Posidonius derives from Posidonian works which seem typically to have surveyed previous Stoic positions and arguments on various subjects prior to Posidonius' presentation of his own view. Later doxographers plundered these works, and ironically tended to preserve Posidonius' presentation of earlier Stoic positions rather than Posidonius' own positions which would have required more effort to summarize. It may also have been assumed, encouraged by Posidonius himself, that his views were merely an interpretation or expansion of those of Zeno and Chrysippus.

Posidonius was one of the most prolific authors of his age, and he wrote in a great number of fields. Unfortunately, the scarce remains of this vast corpus are rarely explicitly attributed to Posidonius. Nevertheless, some 300 attested fragments and testimonia have survived, scattered throughout Hellenistic and Latin literature, in philosophical works and doxographies of philosophers,

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49. E.g., Strabo, I 1. 8-9, 3. 9; II 5. 43; IV 1. 7; VI 2. 11; XVII 1. 21 (= Kidd (1989) I T 214, 221, 208, 229, 227, 207, respectively), and esp. II 2.1-3. 8 (= Kidd (1989) I T 49).

50. They were also attracted, it must be said, by Posidonius' arch-rival, a fellow Rhodian and the greatest orator of the time, Apollonius Molon. It is interesting that the two towering giants in the fields of philosophy and rhetoric shared the same small island of Rhodes

51. A doxography is a collection of opinions of famous people normally arranged according to subject matter. It allowed readers to display superficial erudition in their own writings and in polite society.

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histories and collections of anecdotes, works of professionals (such as the physician Galen), and even in the writings of Christian authors.

Scholars at the beginning of the twentieth century claimed to have found traces of Posidonius in many of the surviving Classical works written after the time of Posidonius. This extreme “Pan-Posidonian” approach evoked an equally extreme reaction, with various scholars questioning whether Posidonius was an original thinker at all (albeit accepting that his influence was very great). The latest edition of the Posidonian fragments and testimonia, begun by Edelstein and completed by Kidd (second edition, 1989), falls into the latter camp, as it includes only those passages explicitly attributed to Posidonius, although there are many other passages whose contents or other data leave us in no doubt as to their Posidonian origin.<sup>52</sup> An edition by Willy Theiler<sup>53</sup> takes a relatively moderate approach, but it was published posthumously and is in an incomplete and problematic state.

The numerous Posidonian fragments and testimonia have been preserved in scores of authors writing in various genres, but a list of his works, such as those provided by Diogenes Laertius in his biographies of several philosophers, has not come down to us. Attempts have been made in modern research to organize the hundreds of fragments and testimonia into some semblance of order, according to works whose titles have survived, or whose titles may be surmised from the subject matter, particularly with regard to Stoic topics where we have the titles of similar works by other Stoics (such as *Politeia*). While we have many Stoic philosophical titles, however, the scientific treatises remain untitled, apart from *On Ocean* and another on the basics of geometry. Much work remains to be done locating, assessing and integrating traces of Posidonian writings. The more his overall system is understood, the easier it will be to locate further passages in later literature which derive, without attestation, from Posidonius.

The number and range even of the relatively few authors who do mention Posidonius as a

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52. Kidd (1989) I p. xvii disagrees with “the more extreme form of Edelstein’s position”, but rightly regards the edition in the present circumstances as a much-needed tool clearly presenting the primary evidence (ibid., xviii).

53. Theiler (1982).

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source indicate just how widespread his influence was. He is named, and seems to have been used extensively, by many of the major Classical authors known to us today, such as Strabo, Cicero, Pliny, Seneca, Diodorus Siculus, Aetius, Athenaeus, Galen and Diogenes Laertius, on a wide variety of subjects, including political and social history, geography, natural history, logic and the exposition of Stoic philosophy. He is also referred to and used by Classical scientists such as Ptolemy, Cleomedes, Symeon Seth and Theo of Smyrna. Another route by which Posidonian influence reached the Jesuits was through the early Christian writers, such as Clement, Augustine, Eusebius and Lactantius who all mention Posidonius, as do the Jewish authors Josephus and Philo.<sup>54</sup> Finally, we should not overlook the Neoplatonists and the Aristotelian commentators, steeped in Platonic, Peripatetic and Stoic (including Posidonian) doctrines who were also consulted by later thinkers. It would seem that it was almost impossible for later authors not to be influenced in one way or another by Posidonius.

Posidonius, like Chrysippus and other Stoics, was not afraid to modify Stoicism for one reason or another, especially if the modification removed inconsistencies within the system while remaining true to what was perceived to be traditional Stoic philosophy. The modification could be quite radical while leaving most of the system apparently untouched, as in the case of Posidonian *pneuma*, with which we shall end this survey of Stoic cosmology.

As we have seen,<sup>55</sup> Chrysippus had introduced a flaw into the theory of the cosmic cycle by positing a compound *pneuma* as the material of the soul. In the conflagration, when god and matter are in their purest state, namely fire, there would be no (compound pneumatic) soul. God's *logos* which restarts the whole cosmic cycle would have no soul to house it. The very idea of the cosmic soul dying seemed to be repugnant to several Stoics, and Panaetius, for one, denied the

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54. The New Testament itself mentions the Stoics and the Epicureans only once (Acts 17:18), and no particular Stoic is ever named. Stoic influence is, however, quite obvious in passages such as John 1:1-3 and II Peter 3:10-13; on Ephesians see Fredrickson (2002).

55. See p. 13 above.

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conflagration.<sup>56</sup> Yet Posidonius returned to this dogma.<sup>57</sup> He was able to do so, I suggest, because he made it possible for *pneuma* to be present at the conflagration. How he did so requires a short digression.

There is an unattributed theory which may be recovered from our sources, explaining how *pneuma* at different temperatures unifies bodies in different ways.<sup>58</sup> Every variation of *pneuma* provides a body with its characteristics (such as hardness and brightness) while also organizing the unified body in a certain overall way. Reference is made to firelike *pneuma* (god) and hot *pneuma* (soul), suggesting a gradation of *pneuma* according to temperature. It would be cold *pneuma*, then, that unifies parts into one inanimate body, such as wood and stone (this *pneuma* is identified with the basic permanent state of the body, *hexis*); warm *pneuma* would unify parts and basic biological functions into one animate body such as a plant (this *pneuma* is identified with *physis*, nature); warmer *pneuma* provides certain animate bodies with sensation and appetite, unifying the whole as an animal (this *pneuma* is identified with *psychē*, the soul); even hotter *pneuma* unifies a body as a logical animal (this *pneuma* is identified with *logos* or *nous*). The theory as I have presented it here clearly replaces the Chrysippean theory of currents of air and *pneuma* which explained the existence and characteristics of compound bodies, and improves upon it by being able to explain different types of body as well (inanimate, animate, conscious, intelligent). The progression from inanimate to fully

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56. On Panaetius denying the conflagration, Diogenes Laertius VII. 142; others before him had had their doubts, cf. *SVF* III *Zeno Tarsensis* 5; III *Diogenes Babylonius* 27 (when Diogenes was young he wrote in support of the notion, but later had doubts). To these, arguably, may be added Boethus who presented arguments for the eternity of the present world; he is a problematic character; see *SVF* III *Boethus Sidonius* 7.

57. According to Diogenes Laertius VII. 134, Posidonius in his *On the Exposition of Physics* is said to have explained that principles (god, matter) are unborn and indestructible bodies without shape, while the elements are bodies with shapes, and are destroyed in the conflagration; cf. Diogenes Laertius VII. 142.

58. My reconstruction is based on *SVF* I. 158, II. 368, 458, 460, together with Kidd II. F 100, 101, 139 comm.

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intelligent body seems, from the analysis so far, to be achieved by the suffusion in the body of *pneuma* at gradually increasing temperatures; the increase in temperature in some way allows the *pneuma* to add powers to the body it is suffusing: the hotter the *pneuma*, the more powers it can add to the body. In fact the process should really be seen in reverse. Philo reports that the *nous* has all the powers,<sup>59</sup> while Themistius identifies the Stoic god as that which permeates the *ousia*, being *nous* here, *psychē* there, here *physis*, there *hexis*.<sup>60</sup> It would seem, then, more accurate to say that according to this Stoic theory, god, as the hottest *pneuma*, has all the powers required for providing a body with a complete set of faculties; and when god chooses to unify a body with less faculties, the *pneuma* provided by god is at the lower temperature required for that task. Such a god is posited by none other than Posidonius: “intelligent and firelike *pneuma*, having no shape, but changing into whatever it wants and being assimilated to all things.”<sup>61</sup>

Although the process should be seen in reverse, the theory is most easily understood if we begin with the coldest *pneuma* and work up from there. The coldest *pneuma* unifies parts as a body, and the *pneuma* in this capacity is seen as the body’s *hexis* or permanent state. A warmer *pneuma* unifies parts as a living body, such as a plant, and the *pneuma* in this capacity is regarded as nature. It can also be seen as taking over the function of the coldest *pneuma* by unifying the parts as a body. A plant, for example, is a body; it has permanent state along with basic life functions. An even warmer *pneuma* unifies parts as an animal, and is regarded as the soul. This warmer *pneuma* also retains the abilities of the colder types of *pneuma*, thereby allowing an animal to be regarded as an animal as

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59. *SVF* II. 458 init.

60. *SVF* I. 158; cf. Diogenes Laertius 7. 138 = Kidd I F 21.

61. *SVF* II. 1009 = Aetius I. 6: ... πνεῦμα νοερόν καὶ πυρῶδες, οὐκ ἔχον μὲν μορφήν, μεταβάλλον δὲ εἰς ὃ βούλεται καὶ συνεξομοιούμενον πᾶσιν. It is presented by Aetius as the Stoic definition of the *ousia* of god, but von Arnim notes that the discussion appears to have derived from Posidonius; cf. Kidd II. F 13 comm. Theiler is more forthright, presenting Aetius 302b22 (=Theiler I. 349) as prefacing this quote with the attribution Ποσειδώνιος, and following the fragment with a partial parallel making this attribution unequivocal: *Commenta Bernensia* 9. 578 (= Theiler I. 350): *Ait enim Posidonius Stoicus: θεός ἐστι πνεῦμα νοερόν διήκον δι' ἀπάσης οὐσίας...*

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distinct from a plant, or as a living creature with the basic life functions in common with plants, or as a simple body with a permanent state. The hottest *pneuma* unifies parts as an intelligent animal, and in this capacity is regarded as *nous* or *logos*. Once again, it includes all the features of the cooler types of *pneuma*. In a human or the cosmos, the hottest part of the soul would contain the ruling principle, but hot *pneuma* would emanate from it to unify the entire body as a rational animal. This said, it is a matter of fact that the rest of the human and cosmic soul comprises somewhat cooler *pneuma* (there would be little point in talking about the hottest part of the soul if this were not the case). In the conflagration, however, when all is fire, the hottest *pneuma* performs all its functions, as *logos*, soul, animal and body. It is here that the Posidonian *pneuma* is clearly superior to the Chrysippean compound version, allowing as it does for an eternal soul to house the *logos*, the ruling principle, which can then pervade and affect the budding cosmos, all in the form of fire.

Since *pneuma* is present at the conflagration when god is fire, and indeed is described as firelike and intelligent when it is god, we may conclude that fire itself is actually *pneuma* at its most rarefied, while the other elements are *pneuma* in more condensed and colder states.<sup>62</sup> The Posidonian description of god as firelike and intelligent *pneuma* may now be understood as describing which sort of *pneuma* is god, and not that *pneuma* altogether, having firelike and intelligent properties, is god. *Pneuma* may appear as fire, or air, or water, or earth. We might suggest that the various types of unifying *pneuma* correspond with these elements. Inanimate objects (rock, wood) are unified by earth; simple living bodies (plants) are unified by water; animals are unified by air (hence the need to breathe); intelligent animals are unified by fire (the need of humans to breathe indicates that their soul is somewhat less than pure fire).

Thus *pneuma*, like *ousia* and its two principles, matter and god, may be distinguished from the four elements and all the bodies in the cosmos only conceptually, and not in reality. *Pneuma*, the *ousia*, matter and god, always take on one form or another. In the conflagration this is fire, while

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62. Posidonius naturally adopted the theory of condensation and rarefaction by which one element turned into another. It is part and parcel of the theory of the cosmic cycle. See Diogenes Laertius, VII. 142; cf. Kidd II. F 13 comm..

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during the rest of the cosmic cycle the forms are manifold. It might appear that Posidonian *pneuma* is redundant, being *ousia* by another name, but I suggest that it is an attempt to express the flexibility of the *ousia* in its many aspects other than the active and passive aspects which are god and matter; the *pneuma* has gradations in temperature, condensation and rarefaction, position, movement and the ability to pervade other aspects of itself. It is the closest a Stoic can get to abstraction on these matters without abandoning that most basic of Stoic concepts, the body.<sup>63</sup>

Posidonian Stoicism, so far as *pneuma*, *ousia* and *kosmos* are concerned, may be summed up and filled out as follows:

- a) The *ousia* is the only thing which is.
- b) The two principles, god and matter, as aspects of the *ousia*, are eternal, and conceptually distinct but in reality are always combined with each other and appear in some elemental form or other (fire, air, water, earth), and nearly always appear in some compound form or other.
- c) The *ousia* is *pneuma*, and as such, *pneuma* cannot be a compound. Both *ousia* and *pneuma* may be distinguished from the elements and bodies only conceptually, since in reality they are always in elemental and corporeal form.
- d) *Pneuma* is a means by which change in the *ousia* may be treated as body.
- e) The conflagration is the *ousia* as *pneuma* in its purest form, fire. I suspect that at the opposite end of the cycle, when the *ousia* is mostly earth, there is still some hot cosmic soul as well; the *ousia* would therefore be less pure at that time. More importantly, the firelike *pneuma* is god with all his faculties, including *logos*, the cause of change in Zeno's cosmos. So too, in the Posidonian system, it is during the conflagration that the *ousia*'s two principles, god and matter, fully intermingle to produce the "logical" or "rational" seeds of the next cosmos.<sup>64</sup>

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63. Very few things in Stoic philosophy are admitted to have no body. These include the void surrounding the cosmos, and time.

64. It is at this stage, at the beginning of the cycle, that the *logos* is with god (as two distinct aspects of

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- f) In the first stage after the conflagration, the *pneuma* condenses and at progressively colder stages becomes, air, water and finally earth. The denser and colder the element, the nearer it is to the centre of the cosmos. Eventually, almost all matter is in the form of earth.
- g) Our world is currently in the second phase of the cosmic cycle, the period of expansion, and the cosmic elemental spheres are observable.
- i. Earth is at the centre.
  - ii. Water surrounds the earth, but the unevenness of the earth causes land to project out of the sea.
  - iii. Air connects the earth with the heavenly sphere (*ouranos*).<sup>65</sup>
  - iv. Fire known as *aithēr* makes up the heavenly sphere.
  - v. Fire builds up in the outer sphere and fills the void surrounding the cosmos.<sup>66</sup>
  - vi. The purest part of the *aithēr*, therefore, already mentioned by Chrysippus, may be the sphere above the fixed stars, where all the excess fire is collected.<sup>67</sup>
- h) God, the hottest and most intelligent *pneuma*, transforms *pneuma* into the multiplicity of bodies which make up the cosmos, by rarefaction or condensation and by pervading compounds to unify them as bodies of various types.
- i) God remains the hottest and most intelligent *pneuma*, fire, in the outermost sphere of the cosmos, and in this rarified form also pervades the cosmos as a whole in order to unite it as an intelligent animal and in order to transmit commands from the ruling principle of the cosmic soul.

Apart from the sophisticated use of *pneuma*, Posidonius reverts to much of the original

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fire), and the *logos* is god (both being fire); cf. the Gospel of John 1:1.

65. Seneca *NQ* 2.4.1 (= Theiler I. 331) declares that air connects the earth with the heaven.

66. Posidonius seems to have claimed that the void surrounding the cosmos was not unlimited, but sufficient to receive the expansion of the cosmos up to the conflagration; see Kidd F 97.

67. Cf. the *empyreum* referred to by the Fathers and Bellarmine, p. 35 below.

### Stoic Influence in the Louvain Lectures

Zenonian cosmology while bringing it up to date to conform with observable facts, with his own measurements and geometrical calculations, and with the work of earlier scientists he has not refuted. At the centre of the cosmos is the earth, the coldest and most condensed form of *pneuma*, and this is surrounded by water. The earth and water are gradually rarefying, giving off vapours which perform various functions in the sky, detailed in works such as the *Naturales Quaestiones* of Seneca. Connecting the earth with the *ouranos* is the air,<sup>68</sup> an immense sphere containing the wandering planets which are composed mainly of fire. The moon, being only 2,000,000 stades (just over 11,000 km) from the earth, is part fire and part air.<sup>69</sup> It is a rarefied body, but deep enough to prevent the sun's rays from penetrating it during an eclipse.<sup>70</sup> The sun is much further away, some 500,000,000 stades (nearly 2,800,000 km) from the earth.<sup>71</sup> If it were any closer, the earth would burn up. By the same reasoning, it follows that the *ouranos* would be a very long way from the earth.<sup>72</sup>

### 3. Stoic Influence in the Louvain Lectures

Posidonius was by no means the only Stoic to be used by later writers, but he is certainly the most influential. His tendency to summarize earlier Stoic thought before presenting his own views

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68. See n. 65 above; the sphere of air may connect the earth with the *ouranos*, but it is the *pneuma* pervading the air and the earth which connects the whole as one intelligent organism; and it is along the rarefied *pneuma*, not the air, that the ruling principle sends its commands.
69. On the distance, Kidd F 120; on the composition, Kidd 122; on the moon's being nourished by vapours from fresh water, Kidd F 10.
70. Kidd F 123 = Cleomedes, *De Motu Circulari Corporum Caelestium* II. 4. 105. Note that the title of the work refers to heavenly bodies rather than heavenly phenomena or objects. The influence of Posidonius on Cleomedes, a writer of uncertain date with estimates ranging from the first century B.C.E. to the fourth century C.E., is very great. Much of the work seems to have been taken verbatim from Posidonius.
71. Kidd F 120.
72. Cleomedes (see n. 70 above) suggests that some stars might be much larger than the sun, indicating that Posidonius believed the *ouranos* to be that much more distant from the earth.

### Whether Heaven is by its Nature Corruptible (57v)

facilitated the task of critics eager to find discrepancies among the Stoics, and of doxographers content with attributing opinions variously to one or other of the Stoics or to all the Stoics indiscriminately. That various writings of earlier Stoics were still in circulation after the time of Posidonius only added to the confusion, and while many Stoic notions became part of the mainstream, they were imperfectly understood by the layman. Sophisticated members of new movements such as the Neoplatonists and Christians exploited these familiar but hazy concepts to attract converts, adapting the old Stoic concepts to the new systems, and incidentally modifying the new systems in the process.<sup>73</sup>

Baldini & Coyne's selection of excerpts from the Louvain lectures is intended to demonstrate Bellarmine's anti-Aristotelian stance. As these authors have already argued (based on the testimony of Scheiner<sup>74</sup>), this anti-Aristotelian stance is due to Bellarmine's loyalty to the New Testament and the Church Fathers. Since the cosmology of the NT and the Fathers is influenced by Stoic, especially Posidonian, cosmology, it should be possible to determine to what extent Bellarmine is influenced, albeit unwittingly and indirectly, by Stoic cosmology, and in what way. Here then, is an analysis of Baldini & Coyne's selection of excerpts from the Louvain lectures.

#### 3.1. Whether Heaven is by its Nature Corruptible (57v)

Bellarmino begins this section by noting that there are two opinions on the topic of the corruptibility of heaven. He states that the first is of Thomas, of many scholastics, and of almost the whole Peripatetic school. Thomas Aquinas and Aristotle are official authorities in Jesuit teaching, and it is remarkable that Bellarmine not only disagrees with them (as it soon transpires), but does so explicitly. The Thomistic opinion is that heaven, being a "certain fifth body" (*quintum quoddam corpus*), is "incorruptible, inalterable, etc." This statement is in fact a conflation of two ideas, that heaven is incorruptible, inalterable, etc., and that this is so because heaven is composed of a fifth

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73. For Stoic influence on the New Testament, see, e.g., n. 54 above.

74. See p. 2 above.

### Stoic Influence in the Louvain Lectures

element.<sup>75</sup> This fifth element in Aristotle's physics is the πέμπτη οὐσία or *quinta essentia*, identified by Aristotle with *aithēr*. Unlike the other four elements, which are naturally inclined to move up (in the case of fire and air) or down (in the case of water and earth), this fifth element occupies the outer sphere of the cosmos where it moves in a circle. The four sublunary elements can interact with each other, causing changes in their quantities and motions, but the *aithēr*, having no contrary, maintains a regular circular motion and suffers no change in quantity. Thus heaven, the outer sphere of the cosmos, is, according to Aristotle, inalterable and incorruptible.

Bellarmino declares that this opinion is in conformity with Psalm 148:6: "He hath stablished them for ever and ever."<sup>76</sup> "They" are the sun and moon, all the stars and the light, the heavens of the heavens, and all the waters above the heavens (148:3-4). Here is Biblical evidence that God has created an eternal cosmos (albeit not quite the Aristotelian version). This verse emphatically contradicts the alternative view supported by Bellarmine, that heaven is corruptible. It might seem surprising that Bellarmine mentions the verse at all, since it is so detrimental to his case. Bellarmine, however, would be obliged to mention a Biblical authority to explain how Thomas could have entertained the notion that heaven is incorruptible, and in any case, it is unlikely that this verse would have been unknown to all of his audience. After a relatively detailed treatment of the alternative opinion, Bellarmine returns to explain away the problem arising from this verse (he refers to it loosely by claiming that it has been said: "heaven is established for ever"<sup>77</sup>). He simply asserts that heaven does not undergo complete corruption,<sup>78</sup> and provides two other verses showing how the eternity of something can be understood in this way in the Bible. Thus Bellarmine is not opposed to the Biblical verses, but to their interpretation by Thomas.

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75. Heaven, like anything else, is conceived as a body in Stoic philosophy; cf. the second opinion immediately below. On the significance of body in Stoic philosophy, see p. 9 above.

76. Psalm 148:6: *statuit ea in aeternum, et in saeculum saeculi.*

77. *coelum statuitur in aeternum.*

78. In the next section, Bellarmine sides with those who understand heaven's destruction to be in substance and not merely in its accidents (see p. 30 below). It is difficult to see what would remain of heaven if it is no longer heaven.

### Whether Heaven is by its Nature Corruptible (57v)

The alternative opinion is immediately attributed to “almost all the fathers”, and then presented. According to this opinion, heaven is a body<sup>79</sup> which is either compound, or composed of one of the elements, such as fire, and is therefore corruptible.<sup>80</sup> The first possibility, that heaven is a compound and therefore corruptible, is quite logical. That a composite is corruptible is a commonplace in Greek philosophy. Bellarmine ascribes it a little later to Plato’s *Timaeus*, claiming that there it is (only) by the will of God that heaven is never to be corrupted. The second possibility is in itself somewhat puzzling. If heaven is made out of a single element, why should it be corruptible? It seems that Bellarmine has in mind the four Aristotelian elements other than quintessence. While the fathers and most philosophers mentioned are influenced by the Stoics in their identification of fire with heaven, Bellarmine assumes this fire to be like Aristotle’s. Thus he conceives his authorities’ linking of fire and corruptibility not in terms of the Stoic conflagration, but in terms of Aristotelian sublunary corruptibility.<sup>81</sup> Interestingly, Bellarmine produces no Biblical authority for the alternative

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79. Baldini & Coyne (1984) 8 miss this second ascription of body (*corpus*) to heaven, translating “... the sky is either composed of various elements or it is made from one of them...”

80. But see §3.3 below.

81. Having mentioned Cicero and Macrobius for the Stoic view that heaven is fiery, Bellarmine continues: *Omnes veteres idem senserunt, ut docet Arist. 2° coel. cap. 7 unde vocaverunt aethera ab ethein, idest comburere* (“All the ancients felt the same, as Aristotle, *De Caelo* II. 7 teaches; whence they called it *aithēr* from [the verb] *ethein*, i.e., ‘to burn’.”). Baldini & Coyne (1984) n. 17 observe that there is no mention of such an etymology in Aristotle, *De Caelo*; but they are mistaken in thinking that Bellarmine attributes this etymology to Aristotle. This is not what the Latin says. Furthermore, Bellarmine would have known that at *De Caelo* I. 3, Aristotle offers an alternative etymology (ἀεὶ θεῖν, “always to run”), and criticizes Anaxagoras for identifying *aithēr* with fire. I have found a parallel for Bellarmine’s etymology in Philo (*SVF* II. 664): “... *aithēr*; holy fire, is inextinguishable flame, as the name itself reveals, said like *aithēin* which in parlance is ‘to burn’.” Bellarmine twice gives his etymology, both here at 57v, and later at 225v, where it is attributed to the Greeks and εθειν appears in Greek letters. *Aithein* has been written *ethein* as it would have been pronounced in *Koinē* or Modern Greek. There is a verb *ethein* in Greek, but it means “to be accustomed”.

## Stoic Influence in the Louvain Lectures

opinion in this section, since he will use them to good effect in the following section which passes from the theoretical to the prophetic.

### 3.2. Whether Heaven will in fact be Corrupted (58r)

Bellarmino opens the section by declaring that it is very certain that there will be a great change in heaven and in the whole world. He widens the issue to include the whole world, I suggest, because the Biblical authorities substantiating the claim refer to the ending of heaven and earth. He adduces Job and Isaiah and some New Testament authorities echoing them; none of these, of course, envisages a final conflagration. Bellarmine includes, however, a relatively long quotation from II Peter 3:10-13 which does describe the conflagration. It is a Stoicizing passage referring explicitly to the dissolution of the elements in heat, the burning up of the earth, and the flaming heavens being destroyed at the coming of the Lord (in Stoic - most probably Posidonian<sup>82</sup> - terms, the Lord would have been god in his purest form during the conflagration); following the conflagration there are new heavens and a new earth, which conforms entirely with Stoic cosmology, and lends itself well to Christian adaptation. The author used what he could of the Stoic cosmic cycle for Christian ends, the conversion of well-educated pagans. Much of his description would have resonated with them.

In the same section Bellarmine considers whether the heavens will be destroyed in their substance or only accidentally (he follows those Fathers who choose the first option), Baldini & Coyne comment that Bellarmine here adds a note in the margin, of which they give only the following translation: “in his *Octavius* Minucius Felix says clearly that the heavens will cease”.<sup>83</sup> Why does Bellarmine not include this testimony in the lecture itself? It is after all strong support from a good authority. Felix Marcus Minucius is an early Christian apologist, being of the second or third century. He was a famous barrister, but all that remains of his writings is a dialogue called *Octavius* in which a Christian Octavius Januarius refutes the attack of a pagan Caecilius Natalis and convinces him of the rightness of Christianity. Minucius is present in the dialogue as adjudicator, just as Cicero is in *De*

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82. On Posidonius and his return to the notion of cosmic conflagration, see p. 21 above.

83. Baldini & Coyne (1984) n. 37.

### Whether Heaven will in fact be Corrupted (58r)

*Natura Deorum*, a work which we have already seen referred to by Bellarmine. Octavius' argument at the beginning of ch. 34 (§344) is that the burning of the world should not come as a surprise if indeed heaven and everything in it should cease as it began. He continues with the Stoic view that fresh spring water nourishes the seas, and will turn into the power of fire and then mentions the Stoics explicitly as having a constant opinion that once vapour has been consumed, the whole world will burn.<sup>84</sup> It is quite possible that Bellarmine did not quote this passage although it supports his thesis that the world will end in flames for the simple reason that it also recalls the rest of the Stoic cosmological cycle, including the point that the present world began in flames.

Minucius' dialogue and II Peter's more straightforward account reflect two standard methods of protreptic in the ancient world, in this case being attempts to attract Stoicized pagans to Christianity. The sophisticated argumentative dialogue form in which the Christian character Octavius made his remarks *ad hominem* to the pagan Caecilius is not amenable to being cited as a properly Christian authority in lectures. Simple accounts such as that of II Peter are eminently more suitable. As for Bellarmine's own view of Minucius, he notes only that which confirms his claim that the heavens will cease. He may have taken an interest in the Stoic account of the transmutation of elements into fire, but we cannot tell. He would not have approved of the Stoic cosmic cycle itself.

Bellarmino's belief that heaven and earth will pass away is not based on Stoicizing Biblical passages *per se*. He cites in support a number of verses from the Old Testament which cannot be accused of Stoicizing. Most of the New Testament passages he cites reflect what is said in the Old Testament passages. The Stoicizing passage from II Peter, however, clarifies just how the old heaven and earth will pass away (without quite explaining how the new heaven and earth come to be), in a blaze of fire. It should be noted that the significance fire has in Stoic cosmology is completely absent. As has already been observed,<sup>85</sup> Bellarmine even confuses heavenly fire with Aristotelian sublunary fire in an effort to explain why a fiery heaven is corruptible.

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84. Minucius mysteriously attributes the same opinion to the Epicureans, and then continues with the opinions of other philosophers who are less decisive regarding the conflagration.

85. See p. 29 above.

## Stoic Influence in the Louvain Lectures

### 3.3. About what was made on the Second Day (223r)

In the Genesis account, God divided the waters from the waters, and separated them by means of a firmament called heaven (*coelum*). This cosmology is alien to Stoic thought, and the Stoicizing early Fathers had already attempted to explain it away while still maintaining its truth. Bellarmine follows their lead, but at the same time he attacks the accommodation made by Thomists between the Biblical account and Aristotle. According to the Thomistic interpretation, the upper water is a crystalline (icy) heaven, separated from the lower water by the starry heaven, which is also made of water. The crystalline and the starry heavens, according to the Thomists, came into being on the second day not as a creation out of nothing, but out of the preexisting water. The inner part of this water remained as the lower water, while the outer parts God endowed with eternal, incorruptible rotation. This change in the upper water's natural movement effectively transformed it into Aristotle's quintessence.<sup>86</sup>

The Thomistic argument regarding the heavenly water could just as easily have applied to air, fire or earth to achieve the same eternally rotating and incorruptible heaven. The eternity of Aristotle's quintessence lay in its circular motion and the fact that none of the sublunary elements with their rectilinear motions could affect it. In short, the Thomistic argument portrays God as changing the movement of a previously "sublunary"<sup>87</sup> element to that of the quintessence.

Bellarmino, who has to accept the existence of an outer watery sphere since this is a Biblical truth, yet opposes the notion that heaven is incorruptible, should have directed his attack against the eternal rotation of the Thomistic heaven which after all is the reason for heaven's incorruptibility in the Aristotelian scheme of things. He may have done this, but in the extracts provided by Baldini & Coyne, Bellarmine is seen to be concerned with attacking the notion of a crystalline sphere above the

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86. I have reconstructed the Thomistic position from the attacks of Bellarmine scattered throughout this section.

87. At the time of the creation of the heavens, the moon had not yet been created, but from the point of view of the Thomists, the primal water would have behaved like Aristotle's sublunary water.

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starry sphere, and that the crystalline sphere should be identified with the firmament. Bellarmine's various arguments serve to align him with authorities older and more substantial than Thomas, namely the New Testament (occasionally), most Fathers (the Greek-speaking anti-Aristotelian Basil is once more singled out<sup>88</sup>), and most philosophers other than Aristotle, who all insist on the fiery nature of the starry heaven (the firmament), and it follows that the outer watery sphere can hardly be icy.

Bellarmino must of course explain how the firmament could be made of fire on the second day, when God divided the upper and lower waters. Here he relies on the explanation provided by those Stoicizing Fathers who claim that the firmament is made of fire: "Therefore the originators of this opinion say that God made the element of fire out of water by means of extension, i.e., rarefaction, so that this would be the firmament which was placed between the waters and the waters."<sup>89</sup> The Fathers had in mind the Stoic process of condensation and rarefaction, and turned it on its head, so that in the first instance fire derived from water. Posidonian *pneuma* in the first instance, i.e., in a cosmic conflagration, was in the form of fire, after which it cooled and condensed into air, then water, and finally earth.<sup>90</sup> In the second stage of the Stoic cosmic cycle, after most of the *pneuma* had become

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88. Cf. p. 3 above.

89. 225v: *dicunt igitur authores huius opinionis, Deum ex aqua per extensionem idest rarefactionem elementum ignis effecisse, ut hoc esset firmamentum, quod positum est inter aquas, et aquas.* The passage appears in Baldini & Coyne (1984) n. 52: they subsequently remark, "The 'authors' under consideration are Saint Basil and others. Even though archaic and strange to modern thinking, the hypothesis developed by Bellarmine in order to give physical coherence to the Biblical passage corresponds to the thinking of some proponents of the new science. Considering, for instance, the corpuscular theory of matter, Galileo assumes that light corresponds to a state of maximum division of particles and that such was the primordial state of matter (Baldini 1976 [= "La struttura della materia nel pensiero di Galileo" in *De homine* 57, 91-164] 132-7, 142-7)." In fact, as we have seen, the physical theory of condensation and rarefaction was well developed in Greek philosophy and used to great effect by Posidonius; but given Galileo's atomic approach, Bellarmine may also have had an atomic conception of the process of rarefaction and condensation; see also next note.

90. See p. 25 above, para. (f).

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earth and it began once more to rarefy, water vapour deriving from both earth and water could nourish fire.<sup>91</sup> Stoic educated Christians attempting to persuade themselves, or Christians attempting to convert Stoic-influenced pagans, could easily assimilate Biblical and Stoic teaching on this point; in order to reach the Stoic fiery heaven familiar to themselves or their audience, they needed to transmute the Biblical water to fire, and they could do this convincingly using Stoic rarefaction.

Interestingly, once Stoicizing notions concerning the fiery nature of heaven had become enshrined in the New Testament, it was only through some form of Stoic or even presocratic conception of the transmutation of elements that the Old and New Testament accounts of the nature of heaven could ever be squared. The Thomists in their attempt to square the Genesis account with Aristotle failed to take the New Testament fiery heaven into account. They succeeded in proving the incorruptibility of heaven at the cost of departing from some New Testament holy scripture. Bellarmine sets out to square all the Biblical accounts, and therefore argues for the fiery nature of heaven which had come into being from water on the second day of Creation. His advocacy of fire as the constituent element of the firmament appears to have required him to believe in the corruptibility of the heavens, since his conception of fire is still Aristotelian.<sup>92</sup> His arguments in favour of fire are probably his own. Air, he argues, should not be considered the firmament, separating lower from upper water, since water vapour rises up through air, and rain comes down through air, showing that air cannot be a barrier between the waters.<sup>93</sup> Fire, he maintains, is more naturally the element of the firmament since the stars themselves are made of fire.<sup>94</sup> Furthermore, were the firmament some other

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91. As already mentioned, the theory of condensation and rarefaction antedates the Stoics by a few centuries, being prominent already in the physical theory of Anaximenes of Miletus (sixth century B.C.E.); see n. 24 above.

92. See p. 29 above.

93. He seems to contradict himself a little later when he asserts that air is one of the three heavens, along with the starry heaven and the empyreum, separating the upper and lower waters.

94. Although Stoics such as Posidonius and Seneca observe the passage of water or water vapour through the air, and all Stoics assumed that stars were made of fire, Bellarmine could easily have made these observations himself.

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body or bodies above fire, it (or they) would be separating the upper water from fire rather than from the lower water; but the firmament is said in Genesis to divide the waters from the waters.<sup>95</sup> If Bellarmine regards the starry heaven as the firmament separating the waters from the waters, it would seem that he regards, or is obliged by the Biblical account to regard, the sphere of air as part and parcel of the lower water; at least, as he has just noted, the air is full of rising vapours and descending rain. This leads us to the question of the number of spheres, which also exercises Bellarmine in this section.

It may be inferred from Bellarmine's comments that each heaven is a body dividing whatever is above from whatever is below it. His survey of the authorities reveals their serious disagreement over the number of heavens, and he attributes this in part to the ambiguity of the Biblical text which refers to the separator as *shamaim* (שמים), which may be understood either as heaven or heavens. It would seem that much of the disagreement is due to his indiscriminate treatment of Stoic-influenced and Aristotelian/Ptolemaic-influenced cosmologies. The Stoic-influenced cosmologies have a low number of off-world spheres, with the most being three, namely, air, starry heaven (the firmament) and an outer sphere called the empyreum ("the one with fire in it"). The Aristotelian-influenced cosmologies have seven spheres to account for the motions of the wandering stars, making the fixed-starry firmament the eighth; and then they disagree on the number of spheres beyond this.

The empyreum may be identified with the accumulating fire expanding into the void prior to the conflagration in the cosmology of Posidonius, and perhaps already in that of Chrysippus who distinguished between the *aithēr* of the starry sphere and the pure *aithēr* above that, where he located the ruling principle of the cosmic soul. It is, however, also to be found in the Aristotelian-influenced cosmologies where it took on quite a different role pertaining to the perfection and incorruptibility of the universe.<sup>96</sup> Why did the Stoic empyreum replace Aristotle's ethereal, quintessential, sphere in

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95. Bellarmine again appears to be contradicting himself, as a little later he approves of the doctrine of three heavens: the airy, the starry, and the empyreum, all lying between and hence together separating, the lower from the upper waters; on which, see immediately below.

96. Grant (2003) 139, paraphrasing Riccioli (1651) in his *Almagestum novum*, pars posterior, p. 238, col.

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these cosmologies? It may be because the Posidonian outer sphere of fire, the seat of the cosmic soul,<sup>97</sup> never entirely disappeared during the cosmic cycle even at the point farthest from the conflagration when most of the *pneuma* was earth. This Stoic form of eternity may have been confused, or wilfully assimilated, with the Aristotelian eternal outer sphere.<sup>98</sup>

Bellarmino of course sides with the majority of Stoic-influenced Fathers (especially Basil), and declares that even those of the Fathers who posited only one or two heavens would all have agreed with the three-sphere option had they been presented with it. Bellarmino's insistence on three heavens seems to be driven by Biblical rather than physical concerns. Air, he argues, is one heaven, since the Bible (in Genesis and elsewhere) speaks of "birds of heaven"; the starry sphere is another heaven, since the place where God fixed the stars is called heaven; the empyreum as the third heaven is "perhaps" what we read about in Psalms 113 where it is said *coelum coeli domino* ("heaven to the Lord of heaven"), and II Corinthians 12:2 mentions the *tertium coelum*. Clearly none of this is Stoic influenced. Bellarmino also provides a physical proof based on optics: the air is diaphanous, the starry sphere is partly diaphanous and partly reflective, while the empyreum is totally reflective. Beyond these heavens Bellarmino locates the sphere of upper water which of course is not a heaven, since the heavens are the spheres separating the upper and lower waters.<sup>99</sup> Bellarmino has effectively removed the upper water from our worldly experience, while postulating it only because it is in the Creation

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1, states, "Only with regard to the empyrean sphere did Riccioli accept the traditional opinion of incorruptibility. That outermost, immobile sphere was, however, invisible, although it was required for the perfection of the universe and for the incorruptibility and eternal well-being of our bodies." For a diagram of an Aristotelian-influenced model with an outer *coelum empyreum*, see e.g., that of Magini-Clavius (1593), reproduced in Lerner (1995) 153.

97. This might explain the reference to "our eternal well-being" in the previous note.

98. Cf. Baldini & Coyne (1984) 37 n. 71 who comment "the *empiraeum* [*sic*] does not seem to be considered as a non-place in which matter and physical space cease (as often in Scholasticism). Bellarmino follows a pre-scholastic tradition..."

99. Bellarmino had earlier ruled out air as the firmament because it did not separate the waters; see p. 35 above.

### On the Work of the Third Day (227r)

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#### 3.4. On the Work of the Third Day (227r)

The final extract from the Louvain Lectures in Baldini & Coyne deals with the composition and nature of the stars, the “lights in the firmament of the heaven” (231r). Here Bellarmine is, as it were, on firmer ground since all the usual authorities, bar Aristotle and the Peripatetics, regard the stars as fiery. The Stoics not surprisingly share this opinion, and Cicero, *De Natura Deorum* II is cited for the second time. Basil is once again singled out as a leading critic of Aristotle’s cosmology.<sup>100</sup>

As Bellarmine observes, the main Aristotelian proof that stars are not made of fire is based on the fact that fire, as one of the sublunary elements, has vertical rectilinear motion, while the stars rotate around the earth. Those, however, who claim the heavenly bodies to be fiery point to the similar effects produced by stars (especially the sun) and by fire here on earth, such as light, heat, drying and vaporisation. It may be noted that neither argument addresses the other, which is not surprising since Stoic cosmology did not arise as a reaction to Aristotle. There is an attempt to undermine Aristotle’s argument a little later, and this may be Bellarmine’s own contribution:

“Nor is that opposed argument worth anything; for fire moves upwards because it is outside its proper region: but in its proper place the stars move circularly for the good of the whole universe and will [so] move until the day of judgement, and then will cease.”<sup>101</sup>

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100. By the time of Basil in the fourth century C.E., elements of Stoic philosophy were being used in attacks on that Aristotelian philosophy which had been gaining in popularity since its publication in Rome in the first century B.C.E. The Stoics themselves before the first century B.C.E. seem to have been aware, if at all, only of the works Aristotle had intended for publication, such as his relatively short-lived dialogues; cf. n. 18 above.

101. Baldini & Coyne (1984) 19 (231v): *neque ratio illa opposita aliquid valet. nam ignis movetur sursum, quia est extra suam regionem: in loco autem proprio moventur stellae circulariter pro bono totius universi et movebuntur usque ad diem iudicii et tunc cessabunt.*

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The argument is weak since Aristotle's sublunary elements move up or down in order to reach their proper place at which point they come to rest. The idea that this same fire could rotate around the earth is remarkably similar to the claim refuted by Bellarmine a little earlier that the upper water could be made to act like the quintessence.<sup>102</sup> While Bellarmine does not suggest that God has caused the whole fiery firmament to rotate like the quintessence, his actual suggestion that fire, once in its proper place, will naturally rotate seems to me to be just as detrimental to his earlier claim that heaven is corruptible. The final part of this quotation, "and will [so] move until the day of judgement, and then will cease", indicates that Bellarmine felt the problem caused by his theory. There is no non-miraculous reason why rotating fire, like the Thomistic rotating water, should stop. The day of judgement provides exactly the sort of miracle Bellarmine requires to extricate himself from a problem of his own making. This is not one of Bellarmine's better arguments.

It should be noted that this passage confirms our earlier suspicion that Bellarmine regards heavenly fire as an offshoot of Aristotelian sublunary fire, for which reason he regards the fiery heaven as *per se* corruptible.<sup>103</sup>

A little later in the same section (231v-232r), Bellarmine considers the cause of the motion of the stars. Are they fixed and moved by heaven, or do they move themselves independently through a heaven which is at rest? God's placing of the stars in the heaven has already been shown by many Fathers to mean much the same as his placing of Adam in the Garden of Eden. Just as Adam was not fixed there, so the stars were able to move from their starting points. Bellarmine continues:

"Whatever the case may be about this argument, if we wish to assert that the starry heaven is but one, and one that is fiery or airy, which we have quite often said to be more in accord with the scriptures, we must now of necessity say that the stars do not move according to the motion of the heaven, but by their own motion, like birds through the air and fish through water."<sup>104</sup>

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102. See p. 32 above.

103. See p. 29 above.

104. Baldini & Coyne (1984) 19 (232r): *sed quicquam sit de hac ratione, si assere velimus coelum*

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Bellarmino continues by pointing out that some stars are faster than others; an unaccountable state of affairs if they were fixed to one rotating sphere. This, however, is precisely the point of Aristotle's several spheres, to take into account the various motions of the planets and stars, which Bellarmine has now lumped into one sphere.<sup>105</sup> No one prior to Bellarmine has suggested that bodies of varying velocities are fixed to the same sphere.

If the starry heaven is fiery and one, while the heavenly bodies move at different velocities, it necessarily follows that the bodies move through the firmament, and are not moved by it: this is a strong argument which Bellarmine fails to exploit to the full (at least in the extracts provided by Baldini & Coyne). Removing the link between the motions of the planets and the motion of the spheres, Bellarmine had the opportunity to refute the thesis that the heavens are incorruptible because of their eternal rotation. Thomas had effectively attributed incorruptibility to the upper water by arguing that God had made it rotate; any element would have had this incorruptibility were it to replace the quintessence in Aristotle's cosmos. By separating the rotation of the stars from the starry sphere itself, Bellarmine was in a position at last to argue that the firmament was corruptible, without simply relying on authorities saying as much; whatever element comprises the firmament, it does not rotate like Aristotle's quintessence, and therefore the firmament lacks the main Aristotelian reason for asserting its incorruptibility.

It seems that Bellarmine feels he has already refuted the claim for heavenly incorruptibility by proving, with numerous authorities,<sup>106</sup> that the starry heaven is made of fire. He wrongly assumes that this fire is essentially Aristotelian, and does not fully<sup>107</sup> grasp the significance of having this element

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*sydereum non esse nisi unum, et illud igneum, vel aereum: quod saepius conformius scripturis esse diximus: necessario iam dicere debemus, stellas non moveri ad motum coeli, sed motu proprio sicut aves per aerem, et pisces per aquam.*

105. As had Pena before him; see n. 2 above.

106. Bellarmine is lecturing in his capacity as a theologian, rather than as a philosopher or astrologer (=astronomer), as he himself hints, e.g., at Baldini & Coyne (1984) 17 fin.

107. His earlier reference to the day of judgement, at which time the rotation of the fiery heaven would stop, suggests that he was at a loss to explain logically how the fire would stop rotating; see p. 38

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rotate, just as he failed to address this particular aspect of the Thomistic claim that God had made the outer waters rotate.

Bellarmino does not explain how the stars move, although there was a Stoic explanation available to him. The analogy with birds and fish might be intended merely to stress the point about motion through a medium, but birds and fish are also animals. Did Bellarmine intend to say that stars have intelligence and decide for themselves where to go? Given the later difficulties he presents in explaining the various orbits of the stars and planets, it would seem that this Stoic idea, which he would have encountered at least in Cicero's *De Natura Deorum* (II. 39-44)<sup>108</sup> was unacceptable to him, no doubt because of the polytheism inherent in the theory. It would have been possible, however, to strip away the internal rationality of the stars (their own *logos* or *ratio*) while retaining the external rationality (the *logos* or *ratio* of nature), and maintain that each heavenly body moves according to ordinary laws of physics.

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above.

108. Cicero wrote the *De Natura Deorum* hurriedly in 45 B.C.E. based on works in Greek. In this passage, detailed physical theories ascribed to Cleanthes, Chrysippus and, of all people, Aristotle, together with traces of the pneumatic theory whereby fire would unite a body as a rational animal, all suggest that Cicero is here using a doxography by Posidonius, who had died quite recently (between 59 and 46 B.C.E., see p. 18 above). What is ascribed to Cleanthes, Chrysippus and Aristotle should be seen as a reinterpretation of their views by Posidonius. Aristotle is rightly claimed to have argued that the stars are living (42; cf. Aristotle, *De Caelo* 292a21-23), but the argument attributed to him proving that their motion is voluntary (44) is somewhat at odds with Aristotle's observation that nature has given to them spherical shape, the shape least adapted to self-motion (291b13-19), because the stars do not need to move themselves in order to attain their end (292a19-24). Views expressed in Aristotle's "exoteric" writings (those intended for publication) could have differed considerably from his "esoteric" writings (those intended for internal consumption and only published in Rome over two centuries after Aristotle's death), especially in the case of his dialogues, in which various positions were presented; Cicero may have taken his information about Aristotle from one of the exoteric works. We cannot tell, since these works have not survived. As for Cicero's own philosophical leanings, see n. 9 above.

## Conclusions

### 3.5. Conclusions

Stoic, especially Posidonian, cosmology indirectly contributed to Bellarmine's break with Aristotle and Thomas in the Louvain lectures, but Bellarmine is far from Stoic in his views. He saw that the Thomists failed to take into account some central Biblical dogmas which were patently at odds with the Aristotelian world view; taking these dogmas into account meant coming into conflict with the Thomists and with Aristotle. Stoic views are reflected in some New Testament dogmas, and when Bellarmine attempts to explain them, he is in this remote and often superficial way influenced to some extent by one Stoic concept or another. However, the basic concept Bellarmine tackles, the destruction or passing away of the present heaven and earth, is a notion encountered several times in the Old Testament, with echoes in the New Testament, and it does not originate in Stoic philosophy. The Stoics, therefore, are not to be blamed for Bellarmine's break *per se* with Aristotle and Thomas. It is his desire to uphold Biblical doctrines contrary to Aristotelian teaching which caused the rift.

Stoic cosmological elements enter the picture because some Stoicizing New Testament passages and many Stoicizing Church Fathers attempted to make Christian teaching on the issue of the End of Days, as on many other issues, appealing to their educated readership (perhaps including themselves). Stoic, especially Posidonian, philosophy was routinely studied in higher education by the first and second centuries C.E., and its major concepts and terminology had become part of the mainstream. Accordingly, Christian doctrines such as the dissolution of this heaven and earth were framed and explained in Stoic terms, as far as possible, within the restrictions of Christian dogma. Among other advantages, a limited amount of Stoic philosophy allowed the advocates of Christianity to present some of their stranger dogmas in a way which sounded reasonable to the layman. For example, the coming of God in the final destruction of heaven and earth could easily be explained with the aid of Posidonian *pneuma*. Posidonian *pneuma* is a simple material, unlike Chrysippean *pneuma* which is a compound of air and fire. In the conflagration, this *pneuma* is in a uniform state and at its most rarefied. In this most rarefied state, it is fire; and in this state it is also at its most

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intelligent, and is God. Thus it is that God is at His most powerful in the conflagration.<sup>109</sup>

Bellarmino therefore on this issue had two major elements to work with: that heaven and earth would pass away (the Hebrew Biblical notion), and that heaven is composed of fire (the Stoicizing Biblical notion). We have already seen Bellarmine state that almost all the Church Fathers believe that heaven is a body which is either compound, or composed of one of the elements, such as fire, and is therefore corruptible.<sup>110</sup> Bellarmine advocates the second option, falsely inferring that heaven is corruptible because it is composed of fire. The inference is false because Bellarmine appears to assume the heavenly fire to be none other than Aristotelian sublunary fire which has reached its natural place at the outer rim of the cosmos. Aristotelian sublunary elements differ from the supralunary element, the quintessence, in that they are subject to change. Bellarmine's argument, even on its own terms, fails to convince; he effectively converts the sublunary fire into something unchanging, akin to the quintessence, by asserting that upon reaching its natural place this fire begins to rotate. The result is that he requires divine intervention on the Day of Judgement to cause the fire to stop rotating.<sup>111</sup>

Heavenly fire, introduced by Stoicizers into the New Testament and early Christian exegesis, might appear to us to be inconsistent with the heavenly water of the Creation. Bellarmine, for whom both Biblical accounts must be correct, provides a superficially elegant solution. The upper and lower waters of the Creation are divided, according to him, by the fiery starry sphere, itself created out of the water. This solution is probably based on a source which could envisage the transmutation of water to fire. Posidonian *pneuma* was condensed from fire into air, water, then earth, and rarefied

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109. Posidonian rarefied *pneuma* in its various aspects is: fire, God, *logos* (misconstrued in the Authorized Version as “the Word”), and soul or spirit (hence “the Holy Ghost”, “the Holy Spirit”, “the breath of God”). Posidonian heavenly *pneuma* was fire, but later interpreters of Stoicizing cosmological accounts tended to confuse Posidonian *pneuma* with the early compound *pneuma*, and this led to some hesitation whether heaven was composed of fire or air: cf. Bellarmine in a passage already quoted, p. 38 above: “...if we wish to assert that the starry heaven is but one, and one that is fiery or airy...”.

110. See p. 29 above.

111. See n. 107 above.

## Conclusions

from earth back up to fire; this was a notion going way back at least to the Milesian Anaximenes, some five centuries before Posidonius. A Stoicizing Church Father would have had no problem expounding this solution, and Bellarmine would have had little choice but to accept such a solution to a problem which was, after all, caused precisely because of Stoicizing influences in the New Testament.

The solution of a fiery sphere separating the upper and lower waters is only superficially elegant, since Bellarmine goes on to advocate a Stoic-influenced cosmological model containing three heavens rather than the one fiery heaven between the upper and lower waters. The model resembles that of Posidonius whereby the earthly sphere is at the centre, surrounded by concentric spheres of water, air and fire. Posidonius also envisaged an outer sphere of emptiness which had enough space to accommodate all the excess rarefied *pneuma* (=fire) produced at the time of the conflagration. According to Bellarmine's model, above the earth is the airy heaven;<sup>112</sup> above this is the fiery sphere of the stars; and above this is the *empyreum*, yet another fiery sphere. The *empyreum* may be identified with Posidonius' outer sphere of excess fire, although the Posidonian function is completely lost. The three heavens of air, stars and the *empyreum* are explained by means of Biblical verses. Were there verses indicating other heavens, Bellarmine would no doubt have added these heavens to the model. However, the similarity between the models of Posidonius and Bellarmine is quite striking. It is all the more similar because Bellarmine, having located the Biblical outer sphere of water beyond the *empyreum*, declares, somewhat conveniently, that this water cannot be seen because the *empyreum* is completely reflective. This may indicate no more than that Bellarmine is following an accommodation between the Biblical and the Stoic-influenced cosmological models that he has found in his Patristic sources, without his being aware of the Stoic source.

Bellarmino's treatment of the planets as free-moving entities flying or swimming in the fiery or airy firmament seems to be imposed upon him by his unwillingness to accept more spheres than

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112. We cannot here equate the airy heaven with the lower waters, although Bellarmine has emphasized elsewhere that water permeates the air in the form of vapours and rain, because the heavens for Bellarmine are separators, and separate primarily the lower from the upper waters.

### **Stoic Influence in the Louvain Lectures**

hinted at by the Biblical verses. Since there are not enough spheres for the planets to receive one each, as in Aristotelian-based cosmologies, the variations in speed and direction among the planets cannot be explained by various spheres. The notion that planets move freely through a single medium is to be found in the Stoic cosmology in Cicero's *De Natura Deorum*, but Bellarmine in any case would have been forced to such a conclusion by his own earlier arguments: the fiery sphere separating the Biblical waters is one, and since the planets are also made of fire (a generally acknowledged fact not restricted to the Stoics), they are located in that fiery sphere; but all the planets move at various speeds and in different directions; therefore the planets move through the firmament and are not fixed to it. It does not seem to me that Bellarmine would have accepted the further Stoic claim, that the planets move of their own volition, since they are fiery and hence intelligent; Bellarmine's Aristotelian-influenced conception of heavenly fire would preclude the notion that the planets are intelligent.

To sum up, there are traces of Stoic influence in Bellarmine's Louvain lectures, mainly as the result of the more profound Stoic (mainly Posidonian) influence on Bellarmine's sacred sources, the features of which Bellarmine, for the mostpart, then misconstrued since they would have had their full Stoic impact only on readers versed in Stoic philosophy. The concepts that remain are drained of all Stoic connotations (e.g., the fiery heaven, the passage from an old to a new heaven). Bellarmine is aware that Stoic philosophy, just like other ancient non-Aristotelian philosophies, has doctrines similar to these sacred sources, and he accordingly cites ancient sources when "the Stoics" along with other philosophers can be shown to support Biblical teaching. Here, however, Bellarmine is interested only in the superficial resemblance between Stoic and Christian concepts; this direct Stoic influence, therefore is largely incidental and secondary. Since it is not obvious why Biblical authority should require further support, it seems to me that the citing of ancient authorities which are in agreement with the Biblical authorities is intended primarily to isolate and thereby further undermine the authority of Aristotle and the Thomists.

## Bibliography

### 4. Bibliography

#### Bibliography

- Algra, KA, 'Zeno of Citium and Stoic Cosmology', *Elenchos* 24, 2003, 9-32.
- Baldini, U & GV Coyne, *The Louvain lectures (Lectiones Lovanienses) of Bellarmine and the autograph copy of his 1616 Declaration to Galileo*, Specola vaticana, Città del Vaticano, 1984.
- Barker, P, 'Stoic Contributions to Early Modern Science' in MJ Osler (ed.), *Atoms, Pneuma and Tranquillity: Epicurean and Stoic Themes in European Thought*, Cambridge University, Cambridge, 1991, pp. 135-154.
- Bryant, JM, *Moral codes and social structure in ancient Greece : a sociology of Greek ethics from Homer to the Epicureans and Stoics*, State University of New York Press, Albany, N.Y, 1996.
- Colish, ML, *The Stoic Tradition from Antiquity to the Early Middle Ages I: Stoicism in Classical Latin Literature*, Brill, 1985.
- Edelstein, L & IG Kidd, *Posidonius*, 2nd edn., Cambridge University Press, Cambridge ; New York, 1989.
- Fredrickson, DE, 'Ephesians and Stoic Physics', *Word & World* 22, 2002, 144-154.
- Glucker, J, 'Theophrastus, the Academy, and the Athenian Philosophical Atmosphere' in JM van Ophuijsen & M van Raalte (edd.), *Theophrastus: Reappraising the Sources*, Brunswick, NJ, 1998, pp. 299-316.
- Glucker, J, *Antiochus and the Late Academy*, Vandenhoeck und Ruprecht, Göttingen, 1978.
- Grant, E, 'The Partial Transformation of Medieval Cosmology by Jesuits in the Sixteenth and Seventeenth Centuries' in J Buchwald & M Feingold (edd.), *Jesuit Science and the Republic of Letters*, MIT Press, Cambridge, Mass, 2003, pp. 127-155.
- Hengel, M, *Judaism and Hellenism: Studies in their Encounter in Palestine during the Early Hellenistic Period*, 1st English edn., SCM Press, London, 1974.
- Lerner, M-P, 'L'entrée de Tycho Brahe chez les jésuites ou le chant du cygne de Clavius' in L

## Bibliography

- Giard (ed.), *Les Jésuites à la Renaissance: système éducatif et production du savoir*, Presses universitaires de France, Paris, 1995, pp. 145-185.
- Ludlam, I, *Antipater of Tarsus: A Critical Edition with Commentary on the Testimonia for his Life, Works and Logic*, Tel Aviv University, Tel Aviv, 1997 (diss.).
- Ludlam, I, 'Two Long-Running Stoic Myths: A Centralized Orthodox Stoic School and Stoic Scholarchs', *Elenchos* 24, 2003, 33-55.
- Lynch, JP, *Aristotle's School: A Study of a Greek Educational Institution*, University of California Press, Berkeley, 1972.
- Osler, MJ & LA Panizza, 'Introduction' in MJ Osler (ed.), *Atoms, Pneuma and Tranquillity: Epicurean and Stoic Themes in European Thought*, Cambridge University, Cambridge, 1991, pp. 1-9.
- Pohlenz, M, *Die Stoa; Geschichte einer geistigen Bewegung*, Vandenhoeck & Ruprecht, Göttingen, 1948.
- Sandbach, FH, *Aristotle and the Stoics*, Cambridge Philological Society, Cambridge, 1985.
- Taub, LC, *Ptolemy's universe : the natural philosophical and ethical foundations of Ptolemy's astronomy*, Open Court, Chicago, 1993.
- Theiler, W, *Posidonios: Die Fragmente*, De Gruyter, Berlin; New York, 1982.

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