ON GREEK BIOLOGY, GREEK COSMOLOGY AND SOME SOURCES OF THEOLOGICAL PNEUMA

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In his masterly study of Stoic cosmology, Michael Lapidge, an adventurous scholar, wrote that 'it has been necessary to consider Chrysippus' theory of cosmic pneuma at some length because this theory, more than any other Stoic cosmological conception, commended itself to a long posterity, and numbered among its descendents the Holy Ghost itself.' Lapidge does not work out the implications of this remark, but some of them I hope will become more apparent after the present paper; though if one of his implications is that there is a descent in the direct line from Chrysippus' pneuma to the Holy Ghost, he, I think, is misleading. Yet there is an important element of truth in this comment, and I would certainly agree that an inspection of Stoic pneuma is of interest not only to the student of Stoicism, but to those who seek for the roots of Christian theology. To see that this is at least very likely to be true we have only to recall that Philo Judaeus is full of Stoicism — and a major patristic source — and that both Clement of Alexandria and Origen, in their different ways, knew the Stoics well; to see why Stoic, and particularly Chrysippean ideas about pneuma, despite their often exotic flavour and occasionally even raunchy formulation, may have been attractive to Christian theologians is one of the aims of the present discussion.

When we study the history and growth of an idea, it is always a bit arbitrary where we pick our starting-point. In the present case it will do to begin with Aristotle, not because none of his predecessors contributed to the growth of the concept of pneuma, but because the texts of Aristotle may be conveniently used as a vantage-point to look forwards, and if necessary backwards as well: backwards towards the Presocratic philosophers and the medical writers where appropriate, and forwards to a later generation of doctors and to the Stoics themselves and beyond. As a theological concept — in some sense of the word 'theological' — pneuma is primarily the construction of Chrysippus, but Chrysippus cannot be understood without reference to the history and origin of Stoicism itself.

For our purposes pneuma originates as a concept in physiology. It originally means 'breath' or 'wind', and Philistion, a Sicilian medical writer influenced by Empedocles and present in Athens about 365 B.C., was in-

2. For an earlier detailed study of the fortunes of pneuma (especially among the early Christians) see G. Verbeke, L'evolution de la doctrine du pneuma du stoicisme a S. Augustin (Paris-Louvain 1945). Interesting things can still be found in F. Rüche, Blut, Leben und Seele (Paderborn 1930).
interested in the role of breathing in the physiology of animals. Aristotle, probably following Diocles of Carystus, and influenced by Diogenes of Apollonia in particular, developed such ideas for his own purposes, emphasizing the distinction between external air and 'connate' or 'inborn' pneuma, which he identified as 'hot air' (GA 2.736A1), and whose origin he located in the heart. But one of the most important features of Aristotle's thought about pneuma is that it developed as an attempt to bridge the apparent gap between soul and body. Now we might suppose that in Aristotle's mature thought there is no real gap to be bridged, for, as the De Anima has it (412B5), soul is the actuality (or form) of a natural body equipped with organs. But the phrase 'equipped with organs' conceals the problem which concerned Aristotle. Since the soul is form, and in a sense immaterial — indeed there is at least one Aristotelian form which has no body at all — then how can an immaterial soul effect, or, in Aristotle's language 'move', a material body? In fact it moves it through the agency of 'organs', 'instruments', and the most important of these instruments is the inborn pneuma. Thus in determining the functions of the pneuma, Aristotle is guided by what he believes to be the capabilities of the soul. Generally speaking, he identifies three: that of generation and nutrition — which he usually treats as a single power — that of sensation, and that of thought. The latter does not require 'instruments' and its performance is not connected by Aristotle with pneuma; indeed nous, or at least some part of nous, is not innate (symphyton) as pneuma is; rather it comes 'from outside' (thy Rathen). In brief, then, the role of pneuma in animals is to enable

5. According to Simplicius, Diogenes thought that the seed of animals is pneumatodes (Byl, note 4, 144).
8. De An. 416A19; though GA 744B33, which distinguishes the threptikon, responsible for the 'being', from the auxêtikon, which causes growth in size, may point towards future (Stoic) developments.
the ‘directions’ of the soul to be carried out in the areas of growth in the widest sense (that is, embracing generation and nutrition), of sensation, and of what is connected in Aristotle with animal responses to sensory stimuli, the ability to move. I do not propose to examine all these functions of Aristotelian 

\textit{pneuma} here. Much of the information about movement is to be found in the \textit{De Motu}, chapter 10, and has been well treated elsewhere, for example by Peck and Nussbaum.\textsuperscript{10} Satisfactory discussions of 

\textit{pneuma} and sensation are also readily available.\textsuperscript{11} For our present purposes it is the generative role of \textit{pneuma} which is more important, not least because consideration of how soul is transmitted to a new individual brings us easily to the basic question of what \textit{pneuma} is.

There are many reasons for thinking that Aristotle’s \textit{doctrine of pneuma} is largely a product of the latest period of his thought. Certainly it is only in the latest biological treatises that it is treated extensively, and especially in the latest major text, \textit{De Generatione Animalium}. Perhaps that is not in itself surprising: the subject-matter is appropriate. More significant is the fact that in the early works, such as the \textit{Eudemus}, where Aristotle taught a Platonic theory of soul and body as separate substances, there is no trace of any theory of \textit{pneuma}. The theory in fact seems to have been developed specifically in connection with Aristotle’s \textit{mature} theory of soul as form of the body,\textsuperscript{12} and, as we have seen, in connection with the organs or instruments of the soul, but also as a solution to those more general problems about how the immaterial moves the material which Aristotle raises in the eighth book of the \textit{Physics}. For, as we shall see, the \textit{aether}, the special substance of the heavens which is involved in the development of the theory of the Unmoved Mover, is connected, in the \textit{De Generatione Animalium}, with the \textit{pneuma} which is necessary for animal reproduction, growth, sensation and movement. I do not think that the specifically \textit{Aristotelian} theory of \textit{pneuma} could have developed until Aristotle had developed both his entelechy-theory of the soul and his theory of the \textit{first} body, the \textit{aether} whose circular movements are visible in the heavens.\textsuperscript{11}

\textit{Pneuma} then is an instrument of the soul, and to perform its functions it

\textsuperscript{9} \textit{GA} 2.736B27ff.; cf. \textit{De An.} 413A4ff.


\textsuperscript{11} Peck (note 6) 589–593.

\textsuperscript{12} Lefèvre (note 6) has demonstrated that there are no good reasons for maintaining the famous thesis of F. Nuyens (\textit{L’évolution de la psychologie d’Aristote} (Paris-Louvain 1948) that there is an intermediate ‘instrumentalist’ phase in Aristotle’s psychology.

\textsuperscript{13} That an important section of \textit{GA} dealing with \textit{pneuma} is \textit{very} late is well argued by F. Solmsen, ‘The Vital Heat, the Inborn \textit{Pneuma} and the Aether’, \textit{JHS} 77 (1957) 119–123. In fact, the whole \textit{GA} is \textit{very} late.
is necessarily a physical substance. Of what, then, is it composed? Originally, as we noted, the word means air or breath, and this gives us part of its meaning for Aristotle. In fact, as he tells us, in *De Generatione Animalium*, *pneuma* is hot air (2.736A2); it contains 'soul-heat' (3.762A21). Heat, one of the traditional 'powers' (*dynameis*) of Greek medicine, is its most active element, but Aristotle, in searching for an instrument of the soul by which the reproduction of animals can be explained, is anxious to make clear that fire alone is inadequate for this purpose (*GA* 2.737A1; cf. *PA* 652A). To identify soul and fire is like identifying a craftsman and his tool. Fire, says Aristotle, does not generate any animal. On the other hand, he believes, the sun's heat is generative, as is the heat in animals. What we are looking for, then, is a hot product of the body which is present in animals and which is also present in their semen, so that the male can impregnate the female. Semen, in fact, is *pneuma* plus water — a proposal with an important future. The role of the semen is to provide the form which will 'set' (*synhistēsi*, 2.737A12-16, 2.739A8) the matter produced in females as menstrual blood, as fig-juice or rennet sets milk.¹⁴ Now to understand a later part of our story it is important to notice various features of Aristotle's theory of conception. First, he specifically rejects an idea current among philosophers and doctors that vaginal secretions produced by women when sexually aroused are essential for conception (*GA* 1.728A1, 2.739A21ff.).¹⁵ Such

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¹⁴ The 'setting' metaphor (cf. Empedocles, fr.33) has its difficulties. Since (in the *GA*) Aristotle does not intend the male to provide matter for the embryo, the question arises: What happens to the semen after intercourse (2.736A23)? The answer is that the water evaporates (2.737A12) while the *pneuma* structures the *menses*, functioning as a heater. Sometimes Aristotle prefers to compare the semen to a carpenter. The carpenter leaves his mark, not himself, on his product (*GA* 723B28, 730B6, 740B25, 743A25). Cf. A. Preus, 'Science and Philosophy in Aristotle's *Generation of Animals*', *JHBiol*. 3 (1970) 27.

¹⁵ That such secretions were so connected was the view of Democritus (*GA* 5.764A10), who held that women emitted semen (cf. Alcmaeon, A14) and perhaps Empedocles (*GA* 1.722B10, but perhaps contrast 4.764A2). The Epicureans took the same view (Lucr. 4.1257, cf. 1229, 1247). The atomists, according to Aristotle, apparently argued that vaginal fluids must be semen because their emission coincides (sometimes) with sexual pleasure in women (*GA* 1.727B34ff., 2.739A27ff.). According to the Democritean theory of 'pangenesis' (Semen comes from every part of the body), it was the bodies of both parents (male and female) which provided it (See G. E. R. Lloyd, *Science, Folklore and Ideology* (Cambridge 1983) 88). The Hippocratic treatise *On the Seed* (ch.4) — possibly satirized in Aristophanes' speech in the *Symposium* — and other Hippocratic texts, especially *On Regimen*, promote similar views, *On the Seed* claiming that sometimes the male emits 'stronger' (i.e. male) seed and sometimes the female, since both males and females emit both male and female seed (cf. Lloyd, op.cit. 89; I. M. Lonie, *The Hippocratic Treatises On Generation*, *On the Nature of the Child*, *Disease IV*, *Ars Medica*, Abt 2, Bd. 7, (Berlin 1981); and more generally E. Lesky, *Die Zeugungs- und Vererbungslehre der Antike und ihr Nachwirken. Akad. der Wiss und der Lit. in Mainz, Abh. der geistes- und sozialwissenschaftlichen Klasse*, Wiesbaden 1950 no. 19, 1225-1425). The position of Anaxagoras, who may have held (but possibly did not hold) a
secretions are not semen, he says; females are only able to produce semen in an impure form in their menstrual blood (2.737A28ff., cf. 1.729A22ff.); and ‘impure’ means, among other things, imperfect. On the other hand Aristotle also rejects the extreme version of the ‘male-superiority’ view (reflected in Aeschylus’ Eumenides (658ff.), Euripides’ Orestes (582), and Plato’s Symposium (208E ff.), Phaedrus and Timaeus, where men ‘pregnant in body’ go to women to produce their children;” in these and parallel medical texts the ‘passivity’ of women is apparent in that they only provide the location (topos) where the seed grows (GA 4.763B). Views of this sort, Aristotle knows, were held by Anaxagoras (763B32) and other ‘physiologers’; perhaps he refers again to Diogenes of Apollonia; they were later adopted in part by the Stoic Zeno. In contrast to all this Aristotle holds that semen in pure form is produced by males and is a mixture of pneuma and water; a weaker version of the same mix, incapable of an active role in generation, is produced by women. We shall return to Aristotle’s ‘balanced’ interpretation when we consider the nature of the ‘setting’ process which he identifies as conception.

As for the pneuma itself, as we have seen, it is heated air, and it is produced from blood. Since pneuma contains ‘soul-heat’ (GA 3.762A17) and is thus the bearer of the soul, at least the reproductive and sensitive soul which ‘subsist’ in it (PA 652B8-13), it must be connected with the heart, the organ which is first produced, according to Aristotle, in the embryo, whose nature position like that of Democritus, is harder to determine; see O. Kember, ‘Anaxagoras’ Theory of Sex Differentiation and Heredity,’ Phronesis 18 (1973) 1-15. Aristotle’s view that it is menstrual blood, not vaginal secretions, which forms the matter of the embryo, is intelligible, although he recognizes the frequent association of vaginal secretions with female sexual pleasure (739A33ff.), for pleasure, as he also observes, is not necessary for conception even when both partners: ‘run the same pace’ (727B7), and in any case, women feel pleasure ‘in the same place as men’ through being touched (he seems to refer to the clitoris), while the secretions are emitted from elsewhere (1.728A32ff., cf. xyomenois (1.728A14). Aristotle was also, of course, well aware that women who did not menstruate — and menstrual blood, the ‘counterpart’ of semen, comes similarly at puberty (727A5ff.) — could not conceive.

Uncertainty whether vaginal fluid or menstrual blood or some third secretion may be the female contribution to conception persisted after Herophilus’ identification of the ovaries and is apparent in Galen’s book 2 On Seed (See A. Preus, ‘Galen’s Criticism of Aristotle’s Conception Theory’, JHBiol. 10 (1977) 84) for Herophilus’ ‘discovery’ of the ovaries see H. von Staden, The Art of Medicine in Ptolemaic Alexandria: Herophilus and his School (Cambridge, forthcoming), ch.6.

18. Diogenes A27 (Censorinus 9.2). For further discussion of the often conflicting evidence about the Presocratics see Lesky (note 15) 52, Lloyd (note 15) 87, Byl (note 4) passim.

150.
seems to indicate the sex of the embryo,19 (Do men and women have
different shaped hearts?), whose size and shape affect our dispositions (PA
667A), and which is, of course, the centre of sensation.20 Pneuma itself is
produced by the heart from the blood. Blood, as Aristotle puts it, is
pneumatized, and pneumatization is a process like boiling. As fluid from
the nourishments of the body passes from the stomach and is heated in the
heart, it is boiled into blood, and some, beyond blood, into pneuma (De
Resp. 480A). Blood and pneuma are carried through the body by the veins
(phlebes).21 More blood is produced than is necessary to maintain the life
and growth of the animal, and the remainder is developed further in
appropriate parts of the body. It becomes milk, menstrual fluid (GA
2.738A36ff.), or, if it is able, in the male, to receive sufficient heating, it
becomes semen (GA 1.726A26). Note that only ‘pneumatized’ blood is
sufficiently hot (PA 649B21ff.) to support life and thus be the bearer of
‘soul-heat’.

There is a further development of Aristotle’s concept of pneuma, touched
upon only briefly in his own writings, but notoriously important for the
future. As we have seen, Aristotle distinguished pneuma from fire, not
simply from the hot. This means, in the terms of his own system, that it is
not to be identified with any of his four terrestrial elements. We may object
to this that it is still identified as hot air, and that fire and air are two of the
elements we find around us. But on one occasion at least Aristotle goes
further, appropriately in De Generatione Animalium which may be iden­
tified as one of the very latest samples of his work.22 Soul, he begins (GA
2.736B230ff.), is ‘connected’ with some bodily substance different from,
and more divine than, the so-called (four) elements. This special substance
is present in varying degrees in the various bearers of soul. It is not fire or
anything like that, but pneuma. Pneuma, he says is in semen, and then,
reasonably, he speaks of a ‘nature’ which is in the pneuma — by which he
must mean the nature of the pneuma, not merely the material fact of its
being hot air, if that means fire plus air, or any other combination or
arrangement of the terrestrial elements. It is in virtue of this ‘nature’ that
pneuma is a ‘counterpart’ of that element which elsewhere he calls the first
(or primary) element; that which composes the stars. Such an element is

19. P. Manuli observes (‘Fisiologia e patologia del femminile negli scritti ippocratici dell’
pocratique de Paris) (Paris 1980) 393) that Greek has no term for sex in the sense that
modern languages have when they deploy the word to express ‘una nozione unificata di
“maschio” e di “femmina”’. Words to translate such English as ‘the male sex’ are rare
enough: see genos IV, phylon 1 2 and physis in LSJ.
22. Solmsen (note 13).
generative, as we have seen, like the sun and the heat of animals, while fire does not generate.

This theory seems to go beyond what we have seen before in that the nature in the *pneuma* appears to be not merely a mixture or arrangement or concoction or end-product or epiphenomenon of the heating of the elements, but something over and above the combination or chemistry of its parts. Presumably we must say that at this stage, if not before, Aristotle thought that the process of pneumatization involved the heating of air in a context where *pneuma* already exists. Existing (connate) *pneuma*, as it were, infects the boiling blood. That is presumably why only living beings, being already possessed of soul, can pneumatize. But Aristotle neither takes nor would wish to take the further step of saying that the *pneuma* in fact is the soul.

At one period of his life, I would argue elsewhere, Aristotle believed in an immanent god, a kind of world-soul. Later, he replaced that world-soul on the one hand by an Unmoved Mover, on the other by *aether* and its souls in the heavens and its counterpart, *pneuma*, on earth.23 But there is one respect in which the claim that *pneuma* is the counterpart of the element of the stars, elsewhere called the *aether*, is of the greatest importance to us now. It identifies the *aether* as alive. In fact the *aether* must be the ‘instrument’ of the souls of the heavenly bodies, just as *pneuma* is the instrument of the animal soul. A step has been taken towards, or back to, what must be called ‘cosmobiology’, and the *aether*, like the *pneuma*, must be the bearer of the design of the soul. Aristotle does not say that it is the seed of the universe, nor does he imply it, but the path to that conclusion is being prepared here and elsewhere. We recall that for Aristotle since earth contains water and water contains *pneuma* and *pneuma* contains soul-heat, all things in a sense are full of soul (*GA* 3.762A18-21); hence the possibility of spontaneous generation.

Aristotle does not actually identify *aether* and *pneuma*. The relationship is left uncertain: *pneuma* is the ‘counterpart’ of the *aether*. What does this mean? Aristotle’s answer can only be guessed at from other ‘counterparts’: feathers of birds are the counterpart of scales of fish, menstrual discharge is the counterpart of semen, etc.24 Thus it seems that *pneuma* is probably a weaker form of *aether* as menstrual blood is a weaker form of semen; certainly that it is a substance which plays the same role in terrestrial life as

23. Speusippus spoke of a ‘vis animalis’ (= δύναμις πνευματική) as administering all things, according to Cicero (*N.D.* 1.32 = fr.39 Lang). Xenocrates too had a fifth element — which he called *aither* and attributed to the *Timaeus* (fr. 56 Heinze).

*aether* plays in the heavens. A possible development, whereby in a sense *pneuma* is not a fifth but a sixth element (as feathers are not scales), was neglected. For *pneuma* might not need similar movements to those of *aether*, viz, circular; *pneuma* and *aether* both, however, *must transmit* the decrees of the soul, and where appropriate convert them into the movements of physical objects.

Before leaving Aristotle, we must return briefly to the counterpart of semen, the menstrual discharge in women, which, according to Aristotle, supplies the matter for the embryo. This substance is also a residue of blood; it is pneumatized to a degree: insufficiently so, however, to be capable of developing to more than a very limited extent.\(^25\) In one place Aristotle says it lacks the ‘principle of soul’ - meaning, I take it, sentient soul (2.737A29): in another, more helpfully, that it can develop up to the level of nutritive soul, but not to sensation (2.736B1 ff.):\(^26\) in another that its nature is to be regarded as ‘prime matter’ (1.729A32). This last must not be taken in the technical sense of the *Physics*: in all living creatures matter has some form, however indeterminate. In this case it is plant-like. And with that we will leave the semi-pneumatized matter in females until we see what the Stoics can do. Remember that already for Aristotle it is neither semen nor *logos*: its only *logos* (‘rationale’) is to be potential (cf. 1.729A26), to be the receiver of definition.

Where then do we find ourselves with *pneuma* at Aristotle’s death? It is a physical substance found throughout the bodies of living beings and is the instrument of their souls in respect of generation, nutrition, sensation and movement. It is the counterpart of the heavenly *aether*. Though spoken of as ‘hot air’, it is neither fire nor air, but a special substance with its own movements produced by the heating and aerating of blood in beings which already possess it. Since species have always been as they are, we assume that there has always been *pneuma* in the world.

*Pneuma* then in late Aristotle plays an important role, though one that is limited and undeveloped. My main subject in this paper, however, is not Aristotle, but Chrysippus, third head of the Stoic school. In Chrysippus the theory of *pneuma* in its original form reached its fullest development, and when we have outlined what it was, we can pause and survey whence *pneuma* had arisen and where it was destined to go. For even many of those who rejected certain features of Chrysippus’ *pneuma*, such as its apparent materialism, made use of specifically Chrysippean developments in forming their more spiritual version of this original phenomenon of hot air. Because

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25. The failure of females adequately to pneumatize the blood is a distinguishing feature of their inferiority (cf. *GA* 716A17, 728A13ff., 765B8ff., 766A32ff.). They are a ‘natural deformity’ (*GA* 4.775A16).

Chrysippus was not the first Stoic, and to understand how his expanded *pneuma* grew from that of Aristotle, we must pause, however, briefly, on his Stoic (and even on his medical) predecessors.

Werner Jaeger was not the first to point out how short a step there might be between Stoic and Aristotelian *pneuma*. Going behind Aristotle, we know that *pneuma* originated in the vitalist world of Greek medicine and medically influenced writers like Diogenes of Apollonia. Matters became more complicated when Aristotle distinguished *pneuma* from the soul as one of its instruments, but Aristotle was still prepared to think of *pneuma* as the bearer of soul-heat. Hence the obvious question: what is the true relationship between the human soul and its *pneuma*? Where Aristotle separated them as form (*logos*) and its instrument, others united them. Thus the Coan doctor Praxagoras, a contemporary of Zeno, seems to have identified the soul as the ‘psychic *pneuma*’ which is nourished by breathing. According to Praxagoras *pneuma*, flowing along the arteries from the heart, sets the sinews in motion and hence produces bodily movements (fr. 9, 11, 75, 85). It is also, it seems, the cause of thought, which is a function of the heart (fr. 62, 72). Here then we have two expansions on the Aristotelian view, both in the ‘upward’ direction: *pneuma* is soul, and it is the cause of thought: the latter as well as the former having been undubitably denied by Aristotle. It is not clear how far *pneuma* is the cause of sensation too, but it is hard to see how Praxagoras could have denied it. On the other hand blood flows through the veins, thus being kept distinct from *pneuma*, and *pneuma* is not involved in digestion, nutrition or growth (fr. 79).

We do not know whether Zeno, the founder of Stoicism, knew of the work of Praxagoras, though later on Chrysippus certainly did. But in Zeno we can see that the relation between *pneuma* and the soul is a problem. There is a special difficulty in that the evidence of Cicero might seem to indicate that for Zeno the soul is not *pneuma* but fire, but the weight of other evidence tells us that to draw such a conclusion would be a mistake. Zeno in fact identified the soul with connate *pneuma*, and a

30. For Chrysippus’ use of Praxagoras on the importance of the heart see SVF II 897. But Chrysippus’ *pneuma* is innate, like Aristotle’s, not acquired like that of Praxagoras (and later doctors such as Herophilus and Erasistratus); cf. Hahm (note 29) 162 and Steckerl (note 29) 19.
31. SVF I 134.
32. SVF I 135–140.
precious text of Rufus of Ephesus tells us that he also identified *pneuma* as *heat*, thus showing how Cicero might casually call the soul *fire*. Zeno’s basic argument appears to have been that when *pneuma* (i.e. breath) leaves the body, the animal dies; therefore *pneuma* is the soul. (Chrysippus’ more sophisticated variant was that death is the separation of soul and body; nothing incorporeal separates from the corporeal; therefore the soul is corporeal). *Pneuma* then is the soul for Zeno, and presumably it performs all the functions of soul, but our existing fragments afford little concrete evidence except, apparently, in the case of sensation (*SVF* I 151).

It is possible that these ideas of Zeno’s are influenced by Aristotle, but if so there is another important difference to be set alongside the Zenonian identification of soul and connate *pneuma*. Zeno apparently makes nothing of Aristotle’s claim in that late text of *De Generatione Animalium* where *pneuma* is said to be some sort of counterpart of the element of the heavens. In view of Chrysippus’ later development of *pneuma*, it is necessary to be clear on this point. As is well known, all the Stoics believed that the Reason of the universe is what they call a creative fire (*pyr technikon*). All things derive from that fire and all return to it. It was never argued by Stoics that all things return to *pneuma*. In view of this, and in view of Aristotle’s identification of *pneuma* as a counterpart of the *aether*, the special ‘first element’ of the heavens, we should observe that for Zeno, the founder of Stoicism, *pneuma* appears to have no connection with the world-soul as *aether*. For Zeno the world-soul is fire, not *pneuma*; not, of course, the common or garden variety we burn in our grates, but the divine, creative variety.

But although Zeno does not identify the world-soul, or God, with *pneuma*, he made some limited use, in his cosmology, of Aristotle’s theories of sexual generation — or of theories like Aristotle’s — and in particular of the account of semen which we find in the *De Generatione Animalium*. God, says Zeno, transformed the whole of substance through air into water. Just as in sexual generation the semen is embraced in the womb, so God, the seminal Reason of the universe, is left behind in the moisture, adapting matter to himself with a view to sequential developments. He then created *pneuma*. In view of this, and in view of Aristotle’s identification of *pneuma* as a counterpart of the *aether*, the special ‘first element’ of the heavens, we should observe that for Zeno, the founder of Stoicism, *pneuma* appears to have no connection with the world-soul as *aether*. For Zeno the world-soul is fire, not *pneuma*; not, of course, the common or garden variety we burn in our grates, but the divine, creative variety.

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33. *SVF* I 127.
first the four elements.\textsuperscript{37} Some of this is unclear, and I do not propose to elucidate it, but we can at least notice that God is identified as ‘seminal Reason’ (logos), that is, God plays the part of an Aristotelian form.\textsuperscript{38} But we should not overplay the influence of Aristotle;\textsuperscript{39} there is nothing in Zeno’s account which \textit{must} be Aristotelian, and there are a number of ideas which Aristotle specifically rejected, and where Zeno does not appear to take account of Aristotle’s view. Rather he employs the notions of earlier writers, holding both that semen comes from all parts of the parent’s body — but only the male parent — and that the embryo is a complete miniature of the adult.\textsuperscript{40} The role of the female is different in Aristotle’s and in Zeno’s account of generation. In Aristotle conception results from the informing of the female matter. In Zeno conception has, as it were, already occurred in the production of semen; the role of the female, as in the \textit{Eumenides}, in Anaxagoras, and elsewhere, is to nourish the embryo it has been given. At this point, as we shall see later, the difference between Aristotle and Zeno will come to have ‘theological’ significance. Naturally since Zeno wants all in the cosmos to derive from his creative fire, and the creative fire is somehow analogous to the male partner in sexual generation, it is clear that the male partner must have a role even larger than that ascribed to him by Aristotle. It may be wondered, in fact, whether for his purposes Zeno has even given him enough. Perhaps he should have reverted to the extreme version of the theory rejected by Aristotle, namely that the female supplies only the space for growth at the time of ‘conception’. But apparently Zeno does not do this: in the womb, he says, the semen is grasped by other \textit{pneuma}, part of the female soul; and as a result it grows.\textsuperscript{41} But what, on the cosmic plane, could grasp the creative fire at the beginning of each world cycle? Such are the problems of cosmobiology. We shall leave Zeno aside and revert to such questions when they become more important in understanding the development of the idea of cosmic \textit{pneuma}.

For Zeno then \textit{pneuma} is restricted to the human domain, but it is the human soul. There is little further to interest us at present in Cleanthes who, partly because of his reading in Heraclitus,\textsuperscript{42} rather conservatively emphasized heat more than \textit{pneuma}.\textsuperscript{43} In the cosmos it seems to have been

\textsuperscript{37} D. L. 7.136 (cf. generally SVF I 102).
\textsuperscript{38} On \textit{spermatikos logos} see further below.
\textsuperscript{39} As seems to be done by Todd (note 36) 144, who speaks of Zeno’s cosmogony as ‘an adaptation of this account’ (viz., Aristotle’s account of sexual generation).
\textsuperscript{40} For Zeno on generation see SVF I 128. Semen is precisely an \textit{apoplasma} of all the parts of the male (material) soul, which is of course, ‘wholly mixed’ with the body.
\textsuperscript{41} SVF I 102. For semen as \textit{pneuma meth’ hygrou} see also I 128, II 741, 742.
\textsuperscript{42} See A. A. Long, ‘Heraclitus and Stoicism’, \textit{ΦΙΛΟΣΟΦΙΑ} 5-6 (1975-6) 133-156 and Hahm (note 29) 144-156.
\textsuperscript{43} For Cleanthes generally see Hahm (note 29) 144-156.
Cleanthes rather than Zeno who claimed that the ‘ruling part’ (hēgemonikon) is to be identified with the sun.\(^4\) In the cosmos too, however, it has been observed that Cleanthes identified the functions of the Aristotelian soul (nutrition, sensation, thinking) as functions of the vital heat.\(^4\) So there is some validity in the view that Cleanthes’ cosmobiology depends heavily on Aristotle’s biology and psychology; but it must not be forgotten that the Aristotelian soul functions through the instrumentality of pneuma, while Cleanthes, though apparently following the lead of Zeno in teaching that the soul is hot pneuma,\(^6\) placed his emphasis on the heat, thus tending to assimilate the human soul to the soul of the cosmos rather than the other way round. Cleanthes, like Zeno, had little (or perhaps even nothing) to say about pneuma in the cosmos.\(^7\) Unlike Zeno, however, he even seems to have tried to reduce its role in the explanation of human behaviour, though he felt unable to eliminate it altogether. By now it was too firmly rooted in both philosophical and medical psychology.

In contrast, at least to some extent, to Cleanthes, his successor Chrysippus, the Stoic who played the major role in developing those aspects of the doctrine of pneuma which I want to draw especially to your attention, was a stickler for logical rigour. The principal dialectician of his School, in the eyes of most in antiquity the logician par excellence, Chrysippus could not be expected to tolerate the ambiguities left by his predecessors about the respective roles of pneuma and of heat in man and in the cosmos. To resolve the problems, he moved largely in the opposite direction from Cleanthes. Pneuma in the cosmos was to reflect exactly pneuma in the individual; the doctrine of man the microcosm was to be worked out as far as it would go without infringing on the ultimate supremacy within the Stoic system of creative fire.

There is one fragment of Cleanthes which I have left aside: Tertullian tells us that the spiritus (that is, the pneuma) which permeates the cosmos has creative force.\(^8\) There is no doubt that this conflicts with Cleanthes’ general view of the role of heat, and perhaps, as has been suggested, Clean-

\(^4\) Hahm (note 29) 150; cf. F. Adorno, ‘Sul significato del termé ήγεμονικόν in Zenone stoico’, \textit{PP} 14 (1959) 31–33; SVF I 499. Some scholars have claimed that Zeno did not apply the word hēgemonikon even to some parts of the human soul; this is an error. (SVF I 151).

\(^5\) Hahm (note 29) 146–149.

\(^6\) SVF I 521, 525.

\(^7\) Lapidge (note 35) 274–275 demolishes the claim that Cleanthes developed a theory of cosmic pneuma. That he did had been argued by Verbeke (note 2) 55, largely on the basis of the weak authority of Tertullian (SVF I 533). As Lapidge says, if Cleanthes did move in this direction, it was probably under pressure from his pupil Chrysippus, but it is more likely that he did not.

\(^8\) SVF I 533; Hahm (note 29) 159.
thes made this move after Chrysippus had joined the school. Be that as it may, this is where the future lay: pneuma is to be the spirit of creativity both in man and in the cosmos. Let us sketch briefly how it was worked out, agreeing with Hahm that the various disagreements between Cleanthes and Chrysippus may have been particularly acute on the subject of pneuma, where real ambiguities in Stoic theory were apparent, and where the developing theories of medical writers (Praxagoras, Herophilus, Erasistratus) to which we have alluded, made it all the more imperative that these ambiguities be resolved.

Pneuma began its history as a feature of animate as opposed to inanimate beings. Its role in Aristotle is largely limited to psychology and biology, though it has its counterpart in the heavenly aether, the first element. Chrysippus must first confirm that parallel and strengthen it: pneuma is once again the counterpart of aether, but now their definition is the same, the latter point, of course, being a massive advance on Aristotle. Not only does Chrysippus’ pneuma in this world correspond to, and perform the same function as, the aether, it seems to be actually identical to it in nature — though the apparently circular movement of aether does not correspond with the ‘tensional’, that is vibrating, movement of pneuma in the lower world.

But for Chrysippus, as a Stoic, pneuma is not an Aristotelian ‘fifth’ element; it is said to be a mixture of air and fire, presumably the basic creative fire. It is a mixture which can be watered down or cooled down in the different circumstances where it may appear. As Galen puts it, pneuma composes both the soul and ‘nature’, that of nature being wetter and colder, that of the soul being hotter and drier. Since, apparently, pneuma itself is ultimately derived wholly from the basic creative fire, Chrysippus seems to have retained the view that its ‘purest’ part will be the hottest part. This hottest part is not the sun, as in Cleanthes, but either the heavens as a whole, the Aristotelian aether, or merely the purest part of the aether. This is the ruling part of the world soul. It is not pure fire, however, as recent scholars seem to believe — and as it was, it seems, for

49. SVF I 525 alludes to a dispute about the role of pneuma in human action, in the case of walking. Antipater of Tarsus later wrote a book on The Differences between Cleanthes and Chrysippus (SVF III Antipater 66).
51. SVF II 471. For the circular movement of aether see SVF I 101, II 579; cf. Todd (note 36) 150 and SVF II 442, 448.
52. SVF II 422, 310, 786; Lapidge (note 1) 174, Todd (note 36) 149, on the role of creative fire.
53. SVF II 787, 841.
54. D. L. 7.139 (SVF II 644) says that both these views were to be found in a book of Chrysippus On Providence.
55. Wrongly Hahm (note 29) 159, Lapidge (note 1) 167.
Zeno (SVF I 154) — but only what Chrysippus called the ‘purest part’. I would argue that this means that it is as ‘firelike’ as *pneuma* can be while remaining *pneuma*. For remain *pneuma* it must until the cosmic cataclysm at the end of each world-cycle when the universe is purified and returns to creative fire. Chrysippus seems to have had a technical term for the eventual translation even of *pneuma* itself (fire plus air) back to its source. The word is *exauchmoutai*; the *pneuma* is ‘dried out’. At this stage it should also be clear that not only is the fire in *pneuma* not the elemental fire of our created world, but that the ‘air’ too is some sort of earlier version. Exactly what it is will appear later.

The point I want to make is that *pneuma* is to be found everywhere in the cosmos, but it is never to be found alone as nothing but a creative principle. Thus though *pneuma* may be described as the creative principle at work at all levels of the cosmos, it is always working, in some way or another, with an inert partner. If it were not, it would not be *pneuma*; it would be creative fire itself. In the world around us it has, in fact, four functions, which correspond to the three functions of soul in Aristotle and to vital heat in Cleanthes, plus the most basic capacity of holding things in being, of giving them a *hexis*. *Hexis* is a Stoic technical term, but it names a developed version of the Aristotelian capacity for generation and nutrition; it is applied not only to the realm of the animate (man, animals, plants), but to the whole range of contents of the universe. It seems to be especially the ‘aerial’ aspects of *pneuma* which has this constitutive function, for the qualities of particular things are in fact *pneumata* or ‘air-tensions’ (*tonous aerodeis*) in the words of Chrysippus himself. *Pneuma*, as a binding force, has a special movement or ‘tension’ of its own, and this tension provides the basis for the notorious Stoic theory of the ‘sympathy’ or ‘fellow-feeling’ of the different parts of the universe, earthly and heavenly, for one another. It is hard to see how the doctrine of cosmic sympathy, which is the indication of the universal presence of *pneuma*, could have developed significantly before Chrysippus had worked out his view that *pneuma* in man is to be defined in the same way as *pneuma* in the cosmos as a whole. It was the logical conclusion of themes worked out by Zeno and Cleanthes, but it had not been logically and universally developed. Yet only with the doctrines of *pneuma* and of cosmic sympathy can the Stoic version of the ethical theme of ‘follow nature’ be given its final rationale.

In addition to being constitutive of matter, to holding things together,

56. D. L. 7.141 (SVF II 589); cf. Lapidge (note 1) 183.
57. For the origin of this idea in Aristotle see Hahm (note 29) 166; for *hexis* and *physis* in general, *ibid.* 163.
58. SVF II 389, 449; Lapidge (note 1) 174 and SVF II 444, 473.
Chrysippus' *pneuma* performs the various other functions of the Aristotelian soul both in the individual and in the cosmos. It is responsible as ‘nature’ for growth and nutrition, as soul for sensation and movement, as reason (*nous, logos*) for thinking. These capacities are distinguished as in Aristotle; plants have ‘nature’ alone, animals have soul for sensation and movement, man has reason in addition. All this, of course, is Chrysippus' transference of the powers of vital heat unambiguously to the *pneuma*, and need not detain us here. It is in its role as the sustainer of existence of all specific objects that *pneuma* has extended itself throughout the universe, so as to become the bearer of the ordering power of creative fire.

Even more interesting — if less clear in the minds of scholars — is the relationship between *pneuma* and the creative fire itself, particularly at the times of generation and destruction for the universe. We have already argued that in the ordered cosmos *pneuma*, according to Chrysippus, is the agent of creative fire, and we shall later show how this agency is described in terms of a semen-like reason. Before that, however, it is, I think, possible to understand the new role and nature of *pneuma* better by considering two themes in Stoic cosmology in a little more detail: the origin of a particular world-cycle, for we know that the Stoics taught that the world is born and dies in monotonous regularity, each cosmos being identical with its predecessors and its successors; and we may also consider the close of each cycle, the periodic conflagration which at regular intervals marks the end of the development and decline of each particular world-cycle.

In the beginning was creative fire; but then there was a world. How did the development occur? Since it is only with Chrysippus that Stoics developed the theory of cosmic *pneuma*, I shall deal with the development in the Chrysippean version, shedding only occasional and incidental light on the views of Zeno and Cleanthes. Chrysippus was fond of allegorizing, and some of his achievements in this area were startling and shocking, but — though the fact has been largely neglected — immensely informative. The difficulty in interpreting the Stoic stories or myths is that they use the name of Zeus to signify two different cosmic phenomena, first the creative fire, and then the agent of that fire, namely the *pneuma*. Dio of Prusa preserves one version of Stoic cosmic mythology as follows: 60 'Zeus, remembering Aphrodite and genesis, softened himself and relaxed himself, and having quenched much of his light, 61 changed into fiery air (i.e. *pneuma*) of gentler fire. Then having had intercourse with Hera . . . he ejected the entire seminal fluid of the universe . . . he made the whole of being wet, etc.'

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60. SVF II 622.
61. It was Chrysippus who spoke of dissolution into light (*phōs* or *augē*) at the conflagration. Hence light is 'quenched' at the death of the cosmos. Cleanthes preferred to talk of flame (SVF II 611).
Interpreting this, we see that Zeus (scil. creative fire) is converted into pneuma, which is in some sense a mixture of primal air and fire. We thus have two 'super-elements', of which the air, mythologically named Hera, is passive and serves as a sex-object for whose sake Zeus produces water (or 'the wet') in the form of seminal fluid.

The myth is still far from clear; more needs to be said about Hera, whose name the Stoics derived from the word 'air'. She is ultimately the product of Zeus himself as creative fire, for Zeus originally changes himself into fiery air. Thus, not being an independent being or cause in the cosmos, she contributes nothing material in the cosmogonical process; she is, as Diogenes Laertius puts it, simply the extension of the ruling part of the divinity into air (7.147). Strictly speaking, in periods between the world cycles, we find no air, no Hera, only Zeus as creative fire. Beyond Zeus there is void, empty space. Thus the production of a world system involves Zeus softening himself into proto-fire and air and generating the seminal wetness into the now air-filled portion of what was previously empty space. It is probable that, mythologizing again, the Stoics, following Hesiod and influenced by the Timaeus, called the wettened air Chaos. Already according to Zeno the name Chaos derives 'from being liquid' (apo tou cheesthai). But returning to Hera, we may guess that the Stoics were willing to speak of their empty space as being air (Hera) after the cosmogonical process has begun, so long as it was understood that the 'air-filled' space only had such positive content as derived originally from Zeus the creative fire. Void of course will include the space in which God transforms himself into pneuma and then performs his sexually cosmogonical act. But to make the mythology work, the Stoics need an account of sexual generation (at least for God) in which the male provides not only the form, the logos, but also the matter of the growing embryo. Such an account, where the female merely provides, in the first instance, the location in which the seed can grow, and later the food on which it is nourished, was available, as we remarked, in Greek biology. Athene, born without a mother, was a popular figure in Stoic circles. She stands for Wisdom and is 'the extension of God's ruling principle into the aether.'

As we have seen, Chrysippus was an allegorizer. One of his most famous efforts in this genre was the treatment of a number of erotic paintings of Zeus and Hera. The most well known reference to this subject, which may refer to the original (humorous) version in the fourteenth book of the Iliad, is that of Diogenes Laertius. Some people, we read, condemn Chrysippus

63. Theog. 116; cf. Lapidge (note 1) 165, (note 35) 259–261; Hahm (note 29) 79.
64. SVF I 103, 104.
65. D. L. 7.147 (SVF II 1021); cf. III 33 Diogenes.
for the fact that he wrote much that is obscene and unprintable. In his book On Ancient Physicists he interprets the material about Hera and Zeus obscenely... saying what no one would soil his lips by repeating... he fashions a tale more appropriate to whores than to gods. Christian writers are less reticent: it is oral sex that Chrysippus has in mind. Clement of Rome observes that Chrysippus in his Erotic Letters speaks of a picture in Argos where Hera rubs her face against Zeus' penis, and Theophilus speaks without circumlocution of Hera receiving Zeus 'with her foul mouth'. At first sight further problems are introduced by a passage of Origen on the same subject. This time the erotic picture is in Samos: Hera is depicted as acting in an unspeakable manner with Zeus. Now Origen says that Hera represents the matter, while Zeus is god (i.e. form) who introduces semen-like principles into his partner. This could be interpreted as an allegory according to the Aristotelian pattern of generation, but Origen's reference to 'unspeakable acts' gives us the true reading. Zeus and Hera are depicted (according to Chrysippus) as engaged in oral sex rather than in purely genital activity precisely because with oral sex there is no question of the female's providing any possible genital fluids which might be thought to contribute towards the actual conception. Hera is impregnated, but without contributing anything but a place for the male semen. We can see, of course, why Diogenes Laertius' informant says that the activities of Zeus and Hera are more appropriate to whores than to gods. Whores traditionally engaged in oral sex to avoid conception. But from the cosmogonical point of view, Zeus' semen is adequate in itself. Dio of Prusa speaks of the 'sons of the wise in unspeakable (!) rituals singing hymns of the blessed (eudaimona) marriage of Hera and Zeus'.

Let us sum it up. Zeus, creative fire, becomes pneuma. Pneuma generates a cosmos, beginning with the four elements, by the emission of sperm-like reason-principles. If this interpretation of the relation of creative fire and pneuma is correct — and I should add in parenthesis that if we are to trust Origen, as we should, pneuma too was sometimes referred to as Zeus — we should expect to find the reverse process, or something like it, occurring at the end of each world cycle. Now what happens on such occasions is hard to understand, and the world conflagrations were much mocked by opponents of Stoicism in antiquity, but it is clear that if the relationship between pneuma and creative fire is as we suggest, some at least of the difficulties disappear. It has been claimed from time to time, and it is still claimed occasionally, that Zeno took over the idea of conflagrations from Heraclitus, presumably seeing a similarity of outlook in that Heraclitus

67. SVF II 1072.
68. SVF II 1073.
69. SVF II 1074.
gave fire the primacy among his elements. But it is most unlikely that Heraclitus taught a doctrine of conflagrations,\(^{70}\) and the notion that Zeno and the Stoics merely took it over becomes less plausible if it can be shown that the logic of their own system needs such an event in any case. There is no doubt that creative fire generates the universe in a fatherlike way through the agency of \textit{pneuma} and his semen-like reason-principles. But if the model is biological and the cosmos is ‘begotten’, one might expect it also to die. And at its death it is subsumed in its maker.

The Stoics held that at that point in time when the planets reach the relative positions they occupied at the beginning of the universe, a conflagration will occur,\(^{71}\) for, it seems, at that moment the \textit{aether} has consumed all the water in the universe. Then the universe will catch fire.\(^{72}\) The original version of this theory, due to Zeno and not involving \textit{pneuma}, had an obvious difficulty. According to Zeno the sun and the moon and the \textit{aether} are themselves creative fire,\(^{73}\) and creative fire does not destroy; obviously it creates. But the theory of Chrysippus avoids this; for him the \textit{aether} is the ‘purest’ physical phenomenon, but it is not identical with creative fire itself. Thus it can still (without contradiction) be nourished by the sea,\(^{74}\) so long as there is water left. But when there is no water left, conflagration ensues, \textit{pneuma} is changed back into creative fire, and creative fire, beginning to create, starts the cycle again. We are not told how long the state of conflagration lasts, but logically it should be merely the turning point between the processes of destruction and reconstruction.

Plutarch has a difficult text which sums up the matter well, though at one point his language is misleading.\(^{75}\) According to Chrysippus, Zeus (in the form of the universe) has a body and soul — that we can now see to be the \textit{pneuma} and quality-less matter or Chaos.\(^{76}\) At the conflagration Zeus, alone of the gods being immortal, withdraws ‘into providence’, that is, into his soul. Both these then come together and persist in the \textit{single} substance of the \textit{aether}. Only the word \textit{aether} distracts us here. Plutarch refers, of course, not to the \textit{aether} we see in the heavens, but to the creative fire itself, which for Chrysippus, if not for Zeno, is distinct, and to which ordinary \textit{aether} most approximates. The idea is conveyed more clearly in a passage of Arius Didymus who speaks of ‘\textit{aether}-like fire’.\(^{77}\)


71. SVF II 625.

72. SVF II 593.

73. SVF I 120; Lapidge (note 1) 178.

74. SVF II 656, 652.

75. Plut., \textit{CN} 1077E (SVF II 1064).

76. For \textit{apoiotes ousia} Todd (note 36) 140 and 141 with 159, note 5.

77. SVF II 596; cf. SVF II 619.
That the dissolution of the cosmos involves the retranslation of *pneuma* into something more primal is further demonstrated by the parallel language used for the death of an individual and the death (scil, conflagration) of the cosmos.78 According to Chrysippus death is the slackening (*anesis*) of the sensible *pneuma* in the body.79 That means that the tension (*tonos*) of the *pneuma* is relaxed and the organism, no longer bound together, begins to disintegrate. Now we remember that it is specifically the ‘element’ of air within the *pneuma* which binds particulars together. Thus we may assume that when the tension is slackened and the body disintegrates, the air ceases to blend with the fire within the *pneuma*; in other words, if the process could be carried far enough, the *pneuma* would revert to its original condition of pure creative fire. Such total dissolution, of course, is what happens at the conflagration; hence it is only to be expected that this too should be described as a slackening or dissolution (*dialysis*).80

It is, of course, the *pneuma* whose tension is slackened, and we can see now at least one reason why Chrysippus rejected Cleanthes’ description of ‘tension’ as ‘a blow of fire’.81 Cleanthes thinks of the universe as a lyre plucked by God as fire; Chrysippus thinks in terms of the *cohesiveness* of the whole body, bound together, as it were, by its sinews (*neura*).82 The basic function of Chrysippean *pneuma* is to bind, to constitute a finite whole.

As Lapidge has observed,83 Christian critics of Stoicism mocked Chrysippus’ idea that God (Dia) as *pneuma* permeates every part of the universe, just as in the human being *pneuma* permeates (*dihēkei*) every part of the body. Their mockery was misplaced. A Stoic theologian could reply that the *pneuma* is the ‘ground of being’ of each and every physical object, and that if it were removed, the object would cease to exist. *Pneuma* wholly permeates all bodies;84 it is the seed and the breath of God which gives life and existence and takes them away.

*Pneuma* is not itself Providence, but it is the instrument of Providence, for it is through the operations of *pneuma* that God’s plan is realized. This plan in fact is incarnated in the semen-like reason-principles of the universe, which are first ejected when Zeus, when God, as we have seen, thinks of Aphrodite and genesis. Let us then look briefly at these coded regulators, these genes, one might almost say, of the living cosmos, these generators which will, in the end work out all for the best, for the accomplishment of the dictates of reason. What then is a semen-like reason-principle and

78. The matter is well discussed by Lapidge (note 1) 182.
79. SVF II 767.
80. SVF II 609, 610, 618, 619.
81. SVF I 563.
82. Hahn (note 29) 170; SVF II 634.
83. Lapidge (note 1) 170; SVF II 1039, 1040.
84. SVF II 463-481.
whence does it come? To the latter question the answer is clear. It comes from God, from the creative fire, just as semen comes from the male animal. So in Chrysippus’ language it is in fact to be identified, more or less, with pneuma. In a man semen is, according to Zeno and Chrysippus, pneuma plus liquid,\(^\text{85}\) an Aristotelian-sounding description; and the same situation can be identified at the cosmic level. (Strictly speaking, of course, we can distinguish between the two principles, the pneuma and the wetness, which together make up the semen). At the cosmic level, as we have seen, both elements, the form-matter, as it were, and the identifiable place for particular created objects, derive originally from the creative fire; but it is in virtue of their being fiery pneuma that the semen-like reason-principles are the bearers of the decrees of Providence. The semen-like reason-principles convey, a little like genes, the encoded messages which are the decrees of God and Reason for the development of the universe. As Chrysippus seems to have put it, ‘The Creative Fire, when it goes forth to create, has embraced all the semen-like reasons, the seeds in accordance with which everything comes to be as is ordained’.\(^\text{86}\)

The Aristotelico-Stoic phase of the history of pneuma, as we have outlined it, is remarkable; pneuma grows from a component of living terrestrial beings, via being a counterpart of the aether, the sphere of the fixed stars, in the hands of Chrysippus, into God in his creative capacity. In Chrysippus’ theory pneuma is the logos of God working actively throughout man, living beings and indeed the cosmos as a whole. Pneuma not only creates all things, or rather, perhaps, projects itself as all things, it holds them in existence and governs their nature and destiny. If I may use the term God, in the Christian sense, of the Creative Fire, then pneuma is the logos of God, God in his active role. But pneuma is not itself God — not yet; ultimately it too is reduced to Creative Fire.

Let me do a bit of speculating — speculating which may help us to understand certain features of early Christian theology in the light of this well developed and well known concept of pneuma. Pneuma is, in these terms, the spirit of God, but a material object and subordinate to God; Macedonius, the fourth century Arian of the Spirit, would have approved, at least in part. Stoic pneuma is in a sense material, but the Stoic God is material too, for Stoicism is a pantheism. So in some respects, though I hope to have at least suggested not in all, Stoic pneuma looks, from the Christian point of view, to contribute to unorthodox theology: pantheism, subordinationism. Morally its sexual roots and associations have funny and disreputable descendents too. Groups of Gnostics, known to Epiphanius,

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85. SVF I 178, II 741, 742.
86. SVF II 1027.
were in the habit of drinking human semen as a communion. Is this merely a dressed-up fertility cult? Our study of pneuma would suggest that it is more. Gnostic pneuma has many roots, far beyond mere Stoicism. But, as it wiggled its way through times and theories, the Stoic association of divine pneuma with semen, coupled with the belief that pneuma is God’s agent, could help stimulate the literal-minded to bizarre behaviour. Applied metaphysics often makes strange ethics.

Pneuma, in Christian and Gnostic theology, comes from above: Stoic pneuma is revealed par excellence in the aether. But Stoic pneuma, unlike Gnostic pneuma, is not selective. We all share in the pneuma, in concrete and material form. Yet the fact that we share it means that there is no special ‘pneumatic’ class of people, whether predestined or otherwise; and no contrast between men who are ‘pneumatic’ and others who are merely ‘moral’ is possible in Stoicism. The pneuma is the abiding mark of God’s presence. Pneuma began as an instrument of the soul by which human actions are accomplished; it finished as the agent of God by which the successive worlds are generated and held in being.

Of course the Stoic version of pneuma carried with it the problem of determinism in two forms — so long as it was encapsulated within the theory that the cosmos is a living organism. For if pneuma is to be identified as the seed of the cosmos, and if the character of pneuma is unchanging, it follows both that the course of events within the total universe is wholly predictable (not merely that it is knowable from God’s point of view), and that with every new creation the same course of events is inevitable. Thus in Stoic language Fate operates both throughout the whole of time and within the time-span of each generated cosmos. The compensation which we have been paid for this, however, is that Stoic attempts to find free will compatible with determinism have an interest which is not only philosophical but, quite independently of their historical roots in theories of pneuma, theological as well.
