THE COSMOLOGY OF 'HIPPOCRATES', *DE HEBDOMADIBUS*

SEVERAL of the treatises and lectures that make up the Hippocratic corpus begin with more or less extended statements about the physical composition and operation of the world at large, and approach the study of human physiology from this angle. We see this, for example, in *De Natura Hominis*, *De Flatibus*, *De Carnibus*, *De Victu*; it was the approach of Alcmaeon of Croton, Diogenes of Apollonia, and according to Plato (*Phaedr.* 270 c) of Hippocrates himself.

The work known as *De Hebdomadibus* would appear to be a prime example of the type. The first twelve chapters are cosmological. They are dominated by two ideas: that everything in nature is arranged in groups of seven, and that the human body is constructed on the same pattern as the whole world. In the later part of the book (13–52) we pass to the subject of fevers, their causation and treatment. But as Roscher observed, the cosmology and the pathology do not belong together. Not only is the hebdomadic principle ignored in the latter, except in the special theory of critical days (26), which is found in other works of the corpus: it is flagrantly contradicted. Chapters 13–16 contain dualistic analysis of the soul in terms of hot and cold, an equation of bodily and cosmic constituents in terms of a four-element theory, and a division of the year into three seasons. These are all topics that have been dealt with in earlier chapters on the hebdomadic principle.

The title *περὶ ἑβδομάδων* is thus only appropriate to the initial chapters; and Galen in fact only applies it to them. His three references to the *περὶ ἑβδομάδων* are to chapters 2, 4, and 6. The pathological part of the book he cites as *τὸ α′ περὶ νούσων τὸ μικρότερον*, and Littré and Ilberg have shown the correctness of this appellation.[1] The extension of the first title to cover both parts is presupposed by the commentary of pseudo-Galen (see below) and by the Latin version that is our most complete source. In what follows I shall disregard it, and treat chapters 1–12 on their own. I assume that they represent the introduction to some other medical disquisition. The sentence in 12 that seems to link it directly with the following discussion of fevers is interpolated, as the ps.-Galen commentary shows.

The work was unknown to the modern world until in 1837 Littré published a notice of it based on a very corrupt text of the Latin version from a Paris manuscript.[2] The text was printed in the eighth volume (1853) of his great edition of the Hippocratica. Shortly afterwards a second, rather better manuscript of the Latin text was discovered, and, better still, a fragment of the Greek text (1–5). These were published in Littré's ninth volume. The three sources were reprinted by the Dutch scholar F. Z. Ermerins in his *Hippocratis et aliorum medicorum veterum reliquiae*, iii (1864), 533 ff. Ermerins made a serious effort to make sense out of the Greek. His emendations are somewhat violent, but there are excellent corrections among them. Then in 1893 C. Harder drew

[1] Littré, viii. 623, 629; Ilberg in *Gr. Studien H. Lipsius dargebracht*, 1894, 33–9.

[2] *Recherches sur une traduction inédite du traité* des Semaines, *livre attribué à Hippocrate dans l'antiquité, et dont le texte grec est perdu* (Paris).

attention to an Arabic manuscript in Munich, which he described as containing a translation of the *De Hebd.* (to chapter 17) and also a translation of a commentary on it by Galen (*Rh. Mus.* xlviii [1893], 433–47). His article contained what appeared to be a German version of the Arabic *De Hebd.* It was only in 1914, when H. Bergsträsser published the complete Arabic text with a literal German translation (*Corp. Med. Gr.* xi. 2), that it was made clear that the manuscript did not contain a continuous translation of the *De Hebd.*, but only lemmata between sections of the commentary (which Bergsträsser showed could not be by Galen). What Harder had printed was a free reconstruction made up from the lemmata, the commentary, and the Latin version; but he left it so unclear what he was about that it is not surprising that people were misled. While his version must not be treated as a source for the text, it remains useful as a contribution to understanding, for it is to this day almost the only version designed to be comprehensible that has appeared in any language.

De Hebd. attracted little general notice until W. H. Roscher came across it in the course of his studies on the number seven in myth, cult, superstition, and philosophy. He became very excited about it, made up his mind that the cosmological part dated from the mid sixth century and was thus the oldest surviving Greek prose, and published a series of lengthy and inexcusably repetitive works in which this view was argued,[1] as well as an edition which remains an indispensable basis for any study.[2] Much interest was aroused at the time. Many scholars were persuaded of the great antiquity of the cosmology, though others, including such authorities as Diels and Boll, insisted that it must be brought down to the fifth or early fourth century.[3] Since then there has been less written. The principal study that remains to be named is that by Kranz in his 'Kosmos und Mensch'.[4]

In embarking upon a new analysis of the cosmology I cannot do otherwise than provide a text and apparatus as a basis for discussion. Roscher's edition will be unavailable to many readers; it could not exploit the ps.-Galen commentary to the full; and it does not attempt to be intelligible, but to report the evidence of the sources. I must say something about these sources now.

The Greek text of 1–5 survives, though partly illegible, on the final page of Paris. gr. 2142. Collations by Ilberg and Kalbfleisch and a photograph are to be found at the end of Roscher's 1911 monograph. I have checked the collations against the photograph as far as I can, and got one or two new readings, e.g. *πάντων τροφός* for *πάντροφος* in 1. 2. Other bits of Greek are supplied by

[1] 'Die Hebdomadenlehre der gr. Philosophen u. Ärzte', *Abh. sächs. Gesellsch.* xxiv (6), 1906; 'Über Alter, Ursprung u. Bedeutung der hippokr. Schrift von der Siebenzahl', ibid. xxviii (5), 1911; *Memnon* v (1912), Heft 3/4; *Phil.* lxx (1912), 529–38; 'Die hippokr. Schrift von der Siebenzahl u. ihr Verhältnis zum Altpythagoreismus', *Verh. sächs. Gesellsch.* lxxi (5), 1919.

[2] *Die Hippokr. Schrift von der Siebenzahl* (Studien z. Gesch. u. Kultur des Altertums vi. 3/4), 1913.

[3] The most important discussions from that period are those of Boll in *N. Jb.* xvi (1913), 137–45 (= *Kl. Schr. zur Sternkunde des Altertums*, 1950, 213 ff.), and his pupil E. Pfeiffer, *Studien zum antiken Sternglauben* (Stoicheia, ii), 1916, 30–8, 119 f. I will also mention here Mras's useful observations on the Latin text, *Wien. St.* xli (1919), 61–74 and 181–92. Other literature will be cited in due course.

[4] *NGG* 1938, 121–61 = his *Studien z. ant. Literatur u. ihrem Nachwirken*, 1967, 165–96. Unfortunately he still quotes Harder's 'Arabic version', as a separate source from ps.-Galen. I regret that M. Wellmann's article in *Quellen u. Studien z. Gesch. d. Naturwiss. u. Medizin*, iv (1933), 6–10, is not to be found in Oxford.

quotations in Philo and Galen. A manuscript destroyed in the Escurial fire of 1671 apparently contained the Greek text or part of it.

The Latin translation is thought to have been made in the early sixth century, when other Hippocratic works were translated. In reading it, it is important to remember that it *is* a translation: phrasing that does not look plausible as Latin often becomes intelligible when turned literally into Greek. Misunderstandings show; for example, we see that the translator took '*OKIMMEPIOΣ* in 11 as one word, and *TAYTA* in 12 as ταῦτα instead of ταὐτά.

The commentary, though not by Galen himself, comes from that milieu, and reflects a text several centuries older than that of the Latin and the extant Greek. Anyone who concerns himself with the text of *De Hebd.* must work carefully through Bergsträsser's edition, for the gain is considerable. Although it does not yield a continuous text, and the language does not (like the Latin) allow the structure of the Greek sentences to shine through, it reveals that the Byzantine text is defective in two different ways. It is lacunose—ps.-Galen shows that phrases and whole sentences have been left out; and in several places what appears in ps.-Galen as an interpretation of the text appears in the manuscripts as part of the text, in other words, interpolations have been made from the exegetical tradition. For instance, in 1. 2 the Greek text has καὶ ἔστι πάντων τροφὸς (sc. ἡ γῆ) ἐξ ὕδατος ἐοῦσα, and the corrupt Latin version may represent the same. Roscher blithely claimed this as a connection with 'Thales and his school'. But the phrase is puzzling in terms of the hebdomadist's system. He certainly does not regard the earth as composed of water, but as a distinct body that has water in and on it. The meaning might be that it came from water in the first place, but the writer has otherwise not a word to say about cosmogony. Now ps.-Galen gives as the lemma, 'the earth surrounds the water', and says that it can also be construed as 'the water surrounds the earth' (which fits the system exactly): this implies something like ἔστι πάντων τροφὸς διὰ τὸ περιέχειν αὐτὴν τὰ ὑγρά. Some interpreters, he says, have explained that the earth is made from water. It is this explanation that has intruded in the Greek text.

Where the Greek is preserved, I have printed it, and supplemented short lacunae in Greek. Elsewhere I give the Latin version, as well as I can recover it from the two mumbling witnesses, transposed into classical spelling. Where ps.-Galen supplies an addition, I sometimes insert it in Bergsträsser's German or in conjectural Greek. It is to be understood that if I mark a lacuna or interpolation in the Latin, I mean that the original Greek text had more or less at the place concerned, and not necessarily that the Latin version ever did. The apparatus does not attempt to record every scribal quirk, but the essentials. The following sigla are used:

A = Ambros. Lat. G 108.
P = Paris. Lat. 7027.
l = effective consensus of *AP*.
G = ps.-Galen as translated by Bergsträsser.
* = alteration by me.

Square brackets in the Greek text enclose passages illegible in the manuscript; in the apparatus they are also used for suggested Greek equivalents to Latin or Arabic wording. Braces { } mark conjectural deletions, half-brackets ⌊ ⌋ words omitted by *A* or *P*.

Text

1 Mundi forma sic omnis ornata est eorumque qu*ae* insunt singulorum. Necesse est septinariam ⌊quidem⌋ habere speciem et definitiones septem dierum ⌊in⌋ coagulationem seminis humani et ⌊in⌋ deformationem naturae hominis et ⌊in⌋ determinationem aegritudinum, et quaecumque deputriunt in corpore ⌊eorum †quae in omne†⌋. Et cetera omnia septinariam naturam habent {em} et speciem, ⌊insuper⌋ et perfectionem et ⌊†perpatris⌋ propter hoc: numerositas mundi *οὕτ*[*ως*]*ἔχει, ἑπταμερέα ἔχων* [*ἐν ἑωυτῷ πᾶσαν ἰδέην καὶ τάξιν ἑκά*]*στου τῶν μερέων ἑπταμερέα·*

2 *μίην μὲν* ⟨*ἐν*⟩ *πᾶσι τάξιν τὴν τοῦ ἀκρίτου κόσμου,* ⟨*δι*⟩*εξ*[*όδους*] *ἔχοντα θέρεος καὶ χειμῶνος· δευτέρην δὲ* {*τάξιν*} *τὴν τῶν ἄστρων ἀναύγειαν καὶ μάνωσιν* {*ῥῦσαν θερμοτάτην*} *καὶ ἀραιοτέρην τῆς φύσιος λαμπηδόνα· τρίτην ἡλίου δίοδον θερμασ*[*ίην*] *ἔχοντ*[*ος*]*· τετάρτην σελήνης ἀνιούσης καὶ τελειούσης πρόσθεσιν καὶ μειούσης ἀφαί*[*ρεσιν*]*· πέμπτη μοῖρα ἡ τοῦ ἠέρος σύστασις* {*καὶ*} *κόσμου, παρέχουσα ὑετοὺς καὶ ἀστραπὰς β*[*ροντάς τε*] *καὶ χιόνας* ⟨*καὶ χαλάζας καὶ τἆλλα τοιαῦτα*⟩*· ἕκτον τὸ τῆς θαλάττης ὑγρὸν μέρος καὶ ποταμῶν καὶ κρηνέων καὶ πηγέων καὶ λιμνέων,* ⟨*καὶ τὸ ἄποτον καὶ τὸ πότιμον*⟩*, καὶ* [*τὸ*] *ἐν τούτοισι θερμόν, ὃ ἀγωγὴ καὶ ἄρδευσίς ἐστι τῆς ἰκμάδος· ἕβδομον αὐτὴ ἡ γῆ, ἐφ' ᾗ τά τε ζῷα καὶ τὰ* [*φυ*]*όμενα* ⟨*. . .*⟩ *καὶ ἔστι πάντων τροφός,* {*ἐξ ὕδατος ἐοῦσα*} ⟨*διὰ τὸ περιέχειν αὐτὴν τὰ ὑγρά*⟩.

2 *οὕτως οἱ τῶν ξυμπάντων κόσμοι ἑπταμερέα ἔχουσι τὴν τάξιν· ἴσοι δὲ τὸν ἀριθμὸν ὁμοῖοί τε τὴν ἰδέην οἱ ὑπὸ τῇ γῇ κόσμοι τοῖσιν ὑπὲρ γῆς. καὶ αὐτόδρομον κύκλωσιν* {*περι*}*ἔχουσι τῆς τε περιόδου καὶ μεθόδου* ⟨*περὶ*⟩ *τὴν γῆν περιπολίην ποιεύμενοι, διὰ τόδε· ἡ γῆ καὶ ὁ Ὀλύμπιος κόσμος ἔχει τὴν φύσιν στάσιμον, τὰ δὲ ἄλλα ὁδὸν ἔχει περιπολίης· κατὰ μέσον δὲ τὸν κόσμον ἡ γῆ κειμένη,* [*καὶ ἑ*]*χουσα ἐν ἑωυτῇ καὶ ὑφ' ἑωυτῇ τὰ ὑγρὰ* ⟨*τὰ τρόφιμα*⟩*, ἐν τῷ ἠέρι ὀχέεται, ὥστε τοῖσι κάτω τάδε μὲν τὰ ἄνω κάτω εἶναι, τὰ δὲ κάτω ἄνω, οὕτω τε διέχειν τά τε ἐκ δεξιῆς καὶ τὰ ἐξ ἀριστερῆς· καὶ περὶ πᾶσαν τὴν γῆν οὕτως ἔχει. — ἡ μὲν χῇ ῥ*[*ῦσα μέση*] *καὶ ὁ Ὀλύμπιος κόσμος ὕπατος ὢν ἀκίνητά ἐστιν· ἡ δὲ σελήνη μέση οὖσα* ⟨*πάντων τῶν ἄλλων μερέων, τῶν μὲν ἀνωτέρων, τῶν δὲ κατωτέρων,*⟩ *συναρμόζει αὐτὴ τἆ*[*λ*]*λα πάντα, ἐν ἀλλήλοισι ζῶντα καὶ δι'*

1. 1. 1 [*ἡ τοῦ κόσμου ἰδέη ὧδε πᾶσα κεκόσμηται καὶ ἑκάστων τῶν ἐν αὐτῷ*] 3 *Philo de opif. mundi* 124 (*i.* 42 *C.–W.*) *φησὶ δὲ καὶ Ἱπποκράτης ὁ τῆς φύσεως ἐπιγνώμων ἐν ἑβδομάδι κρατύνεσθαι καὶ τὴν πῆξιν τῆς γονῆς καὶ τὴν ἀνάπλασιν τῆς σαρκός* 4 [*νούσων κρίσιν*] 5 in corpus. et caetera *A* 5–7 *καὶ τἆλλα π*[*άντα ἑπταμερέα φύσιν ἔχει καὶ ἰδέην, ἔτι δὲ καὶ τέλος* (*sive τελείωσιν*) *καὶ . . . διὰ τόδε. ὁ τοῦ ὅλου ἀριθμὸς*] *οὕτ*[*ως κτλ.*

1. 2. 1 *ἔξοδον Kalbfleisch, διεξόδους Roscher*: transitum *A*, -us *P*: Durchgangsort *G* *ἔχοντος Diels*: *an τὸν . . κόσμον?* 2 *τάξιν* (+*l*) *seclusi* *ἀνταυγίαν* splendorem et laxationem et raritatem naturae et splendidum *l*: das Licht der Sterne und die Porosität und die Feinheit und die Kompaktheit und die Dichte der Physis *G*: 3 *οὖσαν θερμοτάτην* (3) *seclusi* (*glossema ad θερμασίην ἔχοντος ut vid.*), *ἀραιοτέρην scripsi pro ἀραιωτάτην* 5 *πρόσθεσιν* *: *προσθέσει* 6 { }* (aeris constitutio mundi *P*) 7 *Ermerins ex l, cf. G* 8–9 ⟨ ⟩ * *ex G* 11 ⟨ ⟩: wie vollendet sind also diese Geschöpfe geschaffen, und sie vegetieren vollkommen *G* 11–12 *: *irrepsit interpretatio a G memorata; lemma est* die Erde umfasst das Wasser, *sed* vielleicht meint er mit diesen seinen Worten, dass das Wasser die Erde umfasst

2. 1. 3 eiusdem numeri (= *αὐτοάριθμον?*) gyrum habent *l* { }*: *παρέχουσι Ermerins* ⟨ ⟩ *Roscher* 4 *περιπολίην Harder*: *περιπολέην* 6 *τὸν κόσμον* (+*lG*): *fort. τῶν κόσμων* *ὑφ'*: super *l* 7 ⟨ ⟩ * *ex G* *μὲν τὰ Boll*: *μέντοι* 9 *vel ἔχειν* 10 *ὕπατος ὢν Harder* (+*ἀεὶ Boll*): *ὑπὸ τοσῶνδε* 11–12 ⟨ ⟩ * *ex G*

[ἀ]λλήλων διιόντα· αὐτά τε ὑφ' ἑωυτῶν καὶ ὑπὸ τῶν ἀεὶ ὄντων θ[εῶν] ἀϊδίως κινεῖται. ⟨καὶ ἕκαστον αὐτῶν ἰδίην κινεῖται κίνησιν ἑτέρην τῶν ἄλλων, πάντων μὲν ἐν κυκλώσει ἐόντων, τῶν δὲ μερέων ἑκάστου τοῖς ξύμπασι διαφέροντος.⟩

2 τὰ τοίνυν ἄστρα τὰ οὐράνια ἑπτὰ ἐόντα τάξιν ἔχει τῆς τῶν ὡρέων ἐκδοχῆς, μεμ[ερισ]μένην· ὧ[ν ἐπὶ] μιῆς μὲν ὁ ἥλιος, ἡλίῳ δὲ σελήνη ⟨ἀκολουθέει⟩· ἀκολουθέει δὲ Ἄρκτος τῷ Ἀρκτούρῳ ἀκολουθίην ἴ[σην] ὥσπερ ἡλίῳ σελήνη· αἱ δὲ Πλειάδες τῇ[σιν Ὑάσιν] ἀκολουθέουσιν· τῷ δὲ Ὠρίωνι ὁ Κύων. ταῦτα δὲ [τὰ] ἄστρα ἀκολουθίην ἔχει ἀλλήλοισι καὶ ἐναντίωσιν· καὶ γὰρ †ἐκ δεξιῆς† τῆς τῶν ὡρέων †ἑστερίσιος ὁδεύουσιν, ὥστε μὴ [τὴν αὐτ]ὴν στάσιν ἔχειν ὁδοῦ τὰ ἄστρα.

3 {περὶ ἀνέμων.} ἀνέμων αὖ ἑπτὰ ἀνά⟨πνοιαί εἰσιν καθ' ἃς⟩ πνέουσιν περιόδους ποιεύμενοι καὶ κίνησιν ἀόρατον †πλανῆσιν ἀπνευματί† τοῦ πνεύματος ἰσχὺν ποιεύμενοι. ἀρχὴ μὲν οὖν ἀνέμων {ὅθεν οὗτοι πεφύκασιν} ἀπὸ τοῦ θερμοῦ. Ἀπηλιώτης· ἐχόμενος Βορέης· ἔπειτα Ἀπαρκτίας· ἐ[ῖτα Ζέφυρος· μετ' αὐτὸν δὲ ὁ Λίψ· ἔπειτα Νότος· ἐχόμενος Εὖρος. οὗτοι οἱ ἑπτὰ ἀνάπνευσιν ἔχουσιν ὡραίην·

4 {περὶ ὡρῶν.} ὧραι δὲ ἐνιαύσιοι ἑπτά. εἰσὶ δὲ αὗται· σπορητός, χειμών, φυταλιά, ἔαρ, θέρος, ὀπώρ[η], μετόπωρον. αὗται ἀλληλέων διαφέρουσι διὰ τάδε· σπορητὸς ἐν θέρει οὐ γόνιμος, οὐδὲ φύτευσις ἐν μετοπώρῳ, οὐδὲ ἄνθησις ἐν χειμῶνι, οὐδὲ βλάστησις ἐν θέρει, οὐδὲ πέπανσις ἐν χειμῶνι.

5 οὕτω δὲ καὶ ἐπ' ἀνθρώπου φύσιος ἑπτὰ ὧραί εἰσιν, ἃς ἡλικίας καλέομεν· παιδίον, παῖς, μειράκιον, νεηνίσκος, ἀνήρ, πρεσβύτης, γέρων. καὶ παιδίον μέν ἐστιν ἄχρις ἑπτὰ ἐτῶν ⟨καὶ⟩ ὀδόντων ἐκβολῆς· παῖς δὲ ἄχρι γονῆς ἐκφύσεως ἐς τὰ δὶς ἑπτά· μειράκιον δὲ ἄχρι γενείου λαχνώσεως ἐς τὰ τρὶς ἑπτά· νεηνίσκος δὲ ἄχρις αὐξήσιος ὅλου τοῦ σώματος ἐς τὰ τετράκις ἑπτά· ἀνὴρ δὲ ἄχρι ἑνὸς δέοντος ἐτῶν πεντήκοντα ἐς τὰ ἑπτάκις ἑπτά· πρεσβύτης δὲ ἄχρι ἐτῶν πεντήκοντα ἓξ ἐς τὰ ἑπτάκις ὀκτώ· τὸ δὲ ἐντεῦθεν γέρων.

6 Quae autem in terra sunt corpora et arbores naturam similem habent mundo, quae minima et quae magna; necesse est enim mundi partes, cum sint omnia similiter, comparari mundo; ex

13 τε *Ermerins*: τὰ 13–14 αὐτὰ—κινεῖται: facile semper moventur *l*, *admissa var. lect.* ῥαϊδίως *pro* ὑπὸ—θεῶν 14–16⟨ ⟩*: und jedes einzelne von ihnen bewegt sich mit einer von der Bewegung seiner Genossen verschiedener Bewegung, und die Bewegung des Alls ist eine drehende Bewegung; was aber die Teile anlangt, so bewegen sie sich entgegengesetzt der Bewegung des Alls *G*

2. 2. 1 die himmlischen irrenden Sterne *G* 1–2 ὡραίων ἐνδοχῆς ὧ[ν ἐπὶ] *et* 3 ⟨ ⟩*: est unum (istum dum mundum *P*) quidem sol, soli (sol lunam solem *A*) autem luna sequitur *l*: der erste Teil ist die Sonne, und der Mond folgt der Sonne *G* 6 ἐκ δεξιῆς . . . ἐς τὰ ἀριστερὰ *Ermerins*: ad expectationem temporum et immutationem *l*: ἐξ ἐκδοχῆς . . . ἑτεροιώσιος *Boll* (*duce Harder*)

3. 1 ἀνάπνοιαί εἰσιν *Harder* (καθ' ἃς *): regiones septem ⌊respirationes⌋ habent *l* (Tore *G*) 2–3 motum vegetantem erroris respiramen flatus virtutes facientes *l*: der Wind ist von der Kraft des Einziehens der Luft *G* 3–4 { } *Rehm, om. G, qui tamen nescio ubi invenit* sie bewegen sich von einem hochgelegenen Ort 4 Aparktias *G*: ἄρκτος: Africus *l*: Ἀργέστης? *Boll* 6 ἀνάπνευσιν *Ermerins*: ἀνὰ πνεύμασιν: respirationes ⌊sunt⌋ temporales *l*

4. 1 septem, aetheriam partem (-as -es *A*) habentia *l*: in jener Stelle ist ein Teil von den Teilen des αἰθήρ *G* 1 *et* 3 σπορητός *Gal. xvii.* 18 *K.*: σποράτος

5. 1 ἐν ἀνθρώπου φύσει *Philo de opif. mundi* 105 (*i.* 37 *C.–W.*) 2 *post* γέρων *deficit cod.*: *cetera ex Philone* 5–7 *aliter l et testes Latini, v. comm.* 7 *fort.* ὀκτάκις ἑπτά 8 γῆρας κἂν ἀτυχῇ τὰ τοῦ τέλους *excerptum ap. Littré viii.* 633

6. 1. 3 similem compati *P*: [ἐπεὶ ἔχει πάντα ὁμοίως, ὁμοιοῦσθαι τοῖς ὅλοισι]

aequalibus enim partibus et similibus mundo consistunt. Terra quidem stabilis et immobilis: media quidem lapidosa, ⟨ossium⟩ imitationem habens, impassibilis et immobilis natura; quod autem circa eam est, hominum caro, solubilis. Quod autem in terra calidum humidum, medulla et cerebrum hominis, ⟨unde descendit⟩ semen; aqua autem fluminum imitatio est venae et qui in venis est sanguinis; stagna autem vesicae et longao⟨nis⟩; maria vero, qui in visceribus est humor⌊is⌋ hominis. Aer vero spiritus qui est in homine. Luna{e}
2 locus †sensus. Apparet calidum hominis, quomodo in mundo, in duobus locis, ⌊et⌋ ⟨quod⟩ quidem ex solis splendoribus est congregatum terrae, hoc quod in visceribus hominis et quod in venis calidum est; quod autem in superioribus partibus est mundi, quod stellae et sol, quod sub cute est hominis calidum circa carnem, quod per celeritatem splendens mutat colores, sicut et illic Iovem aegiochum invenies esse. Arctos autem fervoris in homine operatio{nem} quae e sole nutrita. Inseparabilis autem soliditas quae mundum continet omnem, cutis coagulatio, frigida constituta. Ergo omnis constitutio uniuscuiusque formarum sic continetur.

7 Uniuscuiusque specierum septem partes. ⟨Hominis septem partes.⟩ Caput una pars; manus operum ministratrix secunda; interiora viscera et praecordiorum definitio tertia; veretri duae partes, una quidem urinae profusio, quarta, alia seminis ministratura, quinta; longao {⌊id est⌋ intestinum maius} cibi sediminis exitus sexta; crura ambulationes septima.

8 Caput ergo ipsum septinarium habet auxilium ad vitam. Frigidi introitus per qu*am* ubique part⟨em pat⟩et, una haec; secunda fervoris exhalatio ex omni corpore; tertia visus, iudicium ⟨colorum et ceterorum⟩; quarta auris, auditus; quinta nares respirantes, odorum intellectus; sexta humoris bibitio{nis} et ciborum transmissio, arteria
9 et stomachum; septima lingua{e}, gustus sensus. Et ipsius quidem vocis ⟨per⟩ septem {vocalium} inarticulatio {litterarum}.

10 Anima{m} itaque septenarium habet: ⟨unum⟩ ⌊calidum ⟨in⟩ s*eminis* form⟨ation⟩*em* septen⟨di⟩ari*am*⌋ constitutum et {in} deficiens facillime eis septem die⟨bu⟩s, quod in aere et quod in animalibus; secundum aerium frigus utile; tertium humorem per totum con-

5 media lapidi quidem ossa *A*: media quidem lapidiosa *P*: liegt in der Mitte der Welt . . . und gleicht den Knochen *G* 8 ⟨⟩* *ex G* (*pp.* 71, 89) 10 longe intestinus natus (= -um maius) *P* 11 dem feuchten Wind *G* 12 Stelle des Gehirns *G*, *interpr.* des Verstandes

6. 2. 1 apparet calidum *Harder*: apparuit iudicium *A*, apparitio dictum *P* 2 quiddam *A* 6 der Saturn, der dort ist, der sich bewegt und kreist *G* 7 Arcturius *A*: ero hos *P* in omnem *P* quaestula enutrita *A*: que e sole nutrita *P*: die beiden Kalbsterne (= Ἄρκτοι) gleichen der (dünnen) Wärme, die im Menschen ist . . . die Sonne leitet die beiden Kalbsterne *G*:* 8 ἄκριτον πάγος *Gal. xix.* 73 *K.* (ἐν τῷ περὶ ἑβδομάδων)

7. 1 ⟨ ⟩* *ex G* 3 die Scheidewand, die φρένες genannt wird *G* 4 similis natura *P* 5 cibis *l*:*

8. 1 [ἡ τοίνυν κεφαλὴ καὶ αὐτὴ ἑπταμερέα ἔχει ὠφελίην πρὸς τὴν ζωήν] 2 quem *l* patet *A*: partet *P*:* 3–4 ⟨⟩* *ex G* 5 artyria *A*: atheria *P*

9. sunt vocales litterae *A*: in sieben Teile geteilt . . . deutlich gemacht *G*:* [δι' ἑπτὰ δηλοῦται]

10. 1 [ἑπτὰ μέρεα] ⟨⟩* 1–2 calidum septe forme septenarium *P*, *om. A*: die ursprüngliche Wärme, die im Anfang der Schwangerschaft ist . . vernichtet sich selbst *G*:* 3 eis *P*: in *A*

stitutum corpus; quartum terrenum, {sanguinem,} cibo indigentem; quintum choleras amaras—aegritudinum dolores multi{tudinum} ⟨ex⟩ his septem dierum; sextum cibum dulcem omne⟨m⟩ {quod est lucrum sanguinis innascens}; septimum omne salsum, delectationum imminutiones.

Natura autem hae septem partes animae; quae cum consilio quidem sine dolore consistunt; ⟨*χρὴ δὲ τὸν ἄνθρωπον, εἴ τι φρονεῖ, ὀρθῶς γνῶναι ὅπως ἐπιμέλειαν ἕξει τοῦ σώματος·*⟩ cetera si recte agunt, vegeti *vivunt* vitam et fortitudinem habent et vivunt sufficienter. Male autem in⟨vicem⟩ compositae curantis peccatis violentum dolorem et iactationem incurrunt; moriuntur autem ⌊homines⌋ advenientibus illis per suas culpas, ipsi sibi vere doloris causa constituti{s}.

11 Terra autem omnis septem partes habet: caput et faciem Peloponnesum, magnarum animarum habitationem; secundum Isthmus, medulla ⟨et⟩ cervix; tertia pars inter⟨iora⟩ viscera et praecordia, Ionie, ⟨und die Bewohner dieser Gegend sind besonders verständig, einsichtig und weise⟩; quarta crura, Hellespontus, ⟨und diese Gegend ist lang ausgestreckt, und geht nach der Richtung unseres Meeres, und sie ist schmal⟩; quinta pedes, Bosporus {transitus} {Thracius et Cimmerius}: ⟨so wisset, dass die Bevölkerung und Bewohner dieser Gegend kräftig, stark, Krieger und Leute von Mut und Tapferkeit sind, und niemand sie zurückhalten kann⟩; sexta venter, Aegyptus et pelagus Aegyptium, ⟨und es ist ein fruchtbares Land, voll Körnerfrüchte und Obst⟩; septima venter inferior et longao {intestinum ⌊maius⌋}, Euxinus Pontus et palus Maeotis, ⟨und dies ist eine grosse Insel von den Inseln des Meeres, die die Abfälle der Erde aufnimmt, und unter ihnen ist eine Insel, die die Abfälle der Wasser des Meeres aufnimmt; in ihrem Volk aber und ihren Bewohnern ist kein Mut, sondern sie sind schwach und dienstfertig und können den Kampf und Krieg nicht ertragen⟩.

12 De autem toto mundo et natura hominis secundum naturam et rationem dixi, quia tale est quale ego ipse ostendo, et quatenus ipsum corpus divisum est. Cum sit ergo eiusmodi mundus, ostendam et in aegritudine haec pati totius mundi et aliorum omnium corpora. Necesse est enim propter eos qui nesciunt mundi totius et omnium naturam ostendere, ut scientes magis adsequi possint quae nunc dicuntur. Manifeste quidem qualia sint haec, ratio naturalis est; docet haec autem ratio quae secundum naturam continent; {ipsas febres et alias causas et quidem acutas aegritudines quomodo fiant docet, et factas quomodo oportet cohiberi †aut non fieri† et nascentes quomodo debeant curari recte.} Considerare ergo oportet secundum hanc rationem omnia.

5 { }*, *cf. G* 6 coleram amaram *A*: bittere Gifte *G*: [*πικρὴν χολήν*] multitudinem *A*:* 7 [*ἑπταημέρων*] 7–8 { }*, *cf. G* locum *P* [*ἐγγινόμενον*] 11 der Mensch muss, wenn er sich um etwas kümmert, seine Ansicht richtig machen, damit er seinen Körper gut behandle *G* 12 [*ἀλλὰ*] 13 vegit in unum *A*, begeti unam *P*:* 14 ⟨ ⟩*: [*ἀλλήλῃσι*] curare his *A*, curantes *P*:* 16 ipsis sibi vere *A*, ipsi bibere *P*:*

11. 3 ⟨ ⟩*, *cf.* 7 4 iuniae *A*, tome *P*: ['*Ιονίη*] 7–8 { }{ }* (oder *Θρᾴκιος* oder *K. G*) hocimerus *A*, onchyme mertus *P*: [*ὁ Κιμμέριος*]

12. 2–3 [*ἔλεξα, ὅτι οὕτως ἔχει ὡς ἐγὼ ἀποδείκνυμι, καὶ ὅκως αὖ τὸ σῶμα μεμέρισται* 3–4 [*καὶ κατὰ τὰς νούσους ταὐτὰ πάσχειν*] 5 [*διὰ τοὺς ἀγνοοῦντας*] 7 [*φυσικὸς λόγος*] 8–11 { }*, *cf. G*

COMMENTARY

1. 1. The opening paragraph states the principle that the world has seven parts, and so has each thing in it. (Cf. Philolaus B 1 *ἁ φύσις δὲ ἐν τῷ κόσμῳ ἁρμόχθη ἐξ ἀπείρων τε καὶ περαινόντων, καὶ ὅλος ὁ κόσμος καὶ τὰ ἐν αὐτῷ πάντα.*) Oddly inserted in the general statement are some special examples known to medicine, not indeed of seven-part structure but of the significance of the seven-day period: the foetus is fully formed in seven days (cf. 10, and *De Carn.* 19); diseases pass critical points; the vital heat extinguishes itself, in the body or in the world at large (? cf. on 10). The logic of the paragraph would be improved if we deleted the first sentence. The work would then start with a medical thesis, the universal theory opening up from it.

1. 2. The seven strata of the natural world are described. It is primarily the macrocosm that the writer has in view, but note the words ⟨*ἐν*⟩ *πᾶσι* at the beginning (not the same as *ἐν τοῖς πᾶσι*, which you are free to conjecture). Corresponding strata will presently be found in the human body, and at one point the microcosmic parallel helps the interpretation.

The seven strata are called *κόσμοι* or *τάξεις* or *μοῖραι*. For the last, cf. Pherecydes B 5 *κείνης δὲ τῆς μοίρης ἔνερθέν ἐστιν ἡ Ταρταρίη μοῖρα* (from a description proceeding in a downward direction, as in *De Hebd.* Later planetary lists usually begin from the outermost: Boll, *RE* vii. 2561); *De Carn.* 2 *ἡ δὲ δευτέρη μοῖρα ἡ κάτωθεν αὐτῆς*. Kranz thought that the use of *κόσμος* was evidence of an early date (not long after 500), when the usage of the word was not yet fixed (pp. 140 f./180 f.). He overlooks the fact that all the parallels come from later writers: Arist. *Mete.* 339ª20, al., *ὁ περὶ τὴν γῆν κόσμος*, ᵇ18 *ὁ περὶ τὰς ἄνω φορὰς κόσμος*, 340ᵇ12 *τοῦ κάτω κόσμου*; oracle of Sarapis ap. Macr. *Sat.* 1. 20. 17 *οὐράνιος κόσμος κεφαλή, γαστὴρ δὲ θάλασσα*; Plut. *de E* 389 f, *de def. orac.* 422 f; Hermetica, Neoplatonists, cf. Kranz, *Kosmos*, 1955 (*Archiv f. Begriffsgesch.* 2), p. 83.

The outermost part is the *ἄκριτον*, later called *ὁ Ὀλύμπιος κόσμος* (twice in 2. 1) and *ἄκριτον πάγος* (6. 2), an undivided concretion, cold like the skin. The term 'Olympus' was used for the outermost firmament by Parmenides (B 11. 2), Empedocles (B 44), and Philolaus (A 16), and thus has a Pythagorean flavour (Pfeiffer, p. 34). *πάγος* is used of the firmament in a doxographer's report of Empedocles A 30 (cf. his *κρύσταλλος*, A 54 etc.), and in *Et. Magn.* 196. 24 from a Homeric allegorizer. The word first occurs as a neuter in [Arist.] *Probl.* 907ª9, and perhaps we should emend to *ἄκριτος* in 6. 2 in view of *De Victu*, 1. 10 *τὸν περιέχοντα πάγον*, which is at once the skin and the firmament in a similar macro-microcosmic system. (See below on 6.) The same treatise suggests an explanation of the mysterious 'passage(s) of summer and winter'. In 1. 10 and 23 the body is said to be provided with *διέξοδοι πνεύματος ψυχροῦ καὶ θερμοῦ, ἔξω καὶ ἔσω*. Plato's *Timaeus* brings further clarification (79d): there are two *διέξοδοι*, the pores of the skin and the respiratory tract, by which the entry and exit of cold and warm air is controlled. (The skin acts as a heat-valve in another way too (74c), producing cooling sweat in summer and retaining the internal heat in winter.) The passages of summer and winter in *De Hebd.* must be a macrocosmic analogue of this physiological system. (Somewhat differently Pfeiffer, p. 31, n. 5.) See also below on chapter 4.

The next three levels are those of the stars, sun, and moon—the plain man's

threefold division that makes no special provision for the planets; cf. e.g. Parm. B 11; Anaxag. B 12; *De Victu*, 1. 10, 4. 89. 1–2. The order is the usual one. The writer goes out of his way to create ornate phrases here. The description of the sun as 'having heat' may seem particularly banal, though the microcosmic parallel (6. 2) gives it its point. Of more interest is the expression used for the stars. *ἀνταύγειαν* presupposes the theory that the stars shine by reflected or refracted light. This is only attested for Metrodorus of Chios (70 A 9) in pre-Alexandrian times, but reflection-theories for various celestial phenomena—sun, comets, Milky Way—were popular in the second half of the fifth century (Empedocles, Hippocrates of Chios and his pupil Aeschylus, Philolaus). It would be implausible for this reason alone to put *De Hebd.* any earlier. *μάνωσιν* and *ἀραιο-* imply that the light from the source is thinned out and rarefied by the stars. 'The finest gleam in nature' is an improbable expression for classical Greek, and I have substituted a comparative, 'a gleam finer than it was by origin'; cf. *De Morbo Sacro* 16. *οὖσαν θερμοτάτην* (a doubtful reading) is ignored by *G* and *l*, is not in accord with the system, and spoils the shape of the phrase: I suggest that it refers to *δίοδον* below.

We descend through the sublunary weather region to the various waters over the earth, and the earth itself. The idea that it is warmth in the water that gives it movement is paralleled in Hippon 38 A 3, *De Victu*, 1. 3 and 35. *πάντων τροφός*: Eur. *Ph.* 686 *ἁπάντων γᾶ τροφός*, etc. So in the *Timaeus*, when Plato passes from the stars to the earth, he calls it *τροφὸν ἡμετέραν* (40b). On the text of what follows, see above, p. 367.

2. 1. The things below the earth are a symmetrical counterpart of those above. The earth rides in mid-air, and those on the other side see our up as down (cf. Philol. B 17 *ἔστι τὰ ἄνω τοῦ μέσου ὑπεναντίως κείμενα τοῖς κάτω. τοῖς γὰρ κάτω τὸ κατωτάτω μέρος ἐστὶν ὥσπερ τὸ ἀνωτάτω, καὶ τὰ ἄλλα ὡσαύτως*; W. Burkert, *Weisheit u. Wissenschaft*, pp. 248 f.), and our right as left (cf. Pl. *Tim.* 43e: right and left are reversed for a man standing on his head). It is not clear that the earth is conceived as spherical. *καὶ περὶ πᾶσαν τὴν γῆν οὕτως ἔχει(ν)* could be so understood, but as Kranz says (p. 143/182), it would have been more natural to use the term *σφαῖρα* or *σφαιροειδής*. See also C. Kahn, *Anaximander*, p. 85, who finds an indication of a flat earth in *ἐν τῷ ἠέρι ὀχέεται*.

The earth and the outer firmament are stationary, the other five *κόσμοι* revolve eternally round the earth, driven by themselves and the immortal gods. In the case of the air and waters we must presumably think of what we would call circulation, but it is surprising to find this treated as similar to the revolutions of the heavenly bodies. It looks very much as if the writer is adapting a system in which the things that revolved between the earth and 'Olympus' were the sun, moon, and planets. This seems to be confirmed by the remarkable addition in *G*, which is much what would be said of the planets with their different speeds but common participation in the daily clockwise revolution. Cf. Pl. *Rep.* 617ab, *Tim.* 36cd, 38c–39d. In the *Republic* they are made to revolve by Ananke and the Moirai, in the *Timaeus* by the creator; in the *Epinomis* (986b) and Xenocrates (fr. 17) they are gods or the vehicles of gods. They were, after all, the star of Kronos, the star of Zeus, etc. This connects with what is said of the propulsion of the *κόσμοι* in *De Hebd.* The fact that the writer does not mention the sun, moon, and planets as an example of a natural heptad has attracted attention and been regarded as setting a

terminus ante quem of *c.* 425 (cf. Burkert, p. 269 n. 76); the planets were known to be five by Philolaus' time (A 16). It seems to me that the hebdomadist may well have lived later, whether or not he was well educated about the planets. His thesis was that the whole universe divides into seven, and he had to include the earth and fixed stars. He ends with a compromise between a system of planetary spheres and a system of elemental spheres such as is probable in Empedocles (cf. Guthrie, *Hist. of Gk. Phil.* ii. 177; *De Carn.* 2).

The moon, being in the middle station, connects (*συναρμόζει*) the other things which live in and traverse each other. The latter part of this curious statement might be more fittingly applied to the constituents of the microcosmic system. It is possible, however, that we have here an echo of older cosmic eschatology. For more than one fifth-century writer (not to mention later ones), the moon marks the boundary between the mortal and immortal worlds (Heraclitus fr. 72b Marcovich, cf. 60d; Alcmaeon 24 A 1, cf. 12; Emp. A 62); according to the old Pythagorean *σύμβολον*, the sun and moon are the isles of the blest. In my forthcoming book *Early Greek Philosophy and the Orient* I relate all this—on more elaborate grounds than can be indicated here—to the Indian belief that the souls of the dead go to the moon and are there either turned back to enter another mortal life or allowed to pass on to paradise. Emp. B 115 describes how the exiled god, passing through many mortal bodies, is transferred from aither to sea, sea to earth, earth to sunlight, while Heraclitus had spoken of mortals living in the death of immortals, and vice versa. Here is one complex of ideas that may be relevant to the *De Hebd.* passage. At the same time the concept of joining is significant. Again it comes in Heraclitus, and thereafter in the Pythagorean line of tradition: Empedocles, Philolaus. (See the index to Diels–Kranz s.vv. *ἁρμόζειν*, *ἁρμονία*, *συναρμόττειν*.) In Philolaus it clearly has musical associations, and in the fourth century, if not earlier, we get the identification of the celestial spheres with a musical scale: 'Orpheus' *Lyra* (Nock, *CR* xli [1927], 170; xliii [1929], 60 f.); Scythinus, DK 22 C 3. 1; Pl. *Rep.* 617b, *Tim.* 36; 'the Delphians' ap. Plut. *qu. conv.* 745b (Xenocr. p. 76 Heinze). The scale is a *ἁρμονία*, and it pivots on the middle string, the *μέση*. Below it is the *ὑπάτη*, cf. *ὁ Ὀλύμπιος κόσμος ὕπατος ὤν* (Boll, p. 145), and Xenocr. fr. 18. In the 'Delphian' scheme (adduced by Pfeiffer, p. 119) it is the region of the planets that occupies the middle place: *μέσην τὴν μεταξὺ συνέχουσαν ἅμα καὶ συνεπιστρέφουσαν ὡς ἀνυστόν ἐστι τὰ θνητὰ τοῖς θείοις καὶ τὰ περίγεια τοῖς οὐρανίοις*. In the *Timaeus* the four elements, too, are felt to need holding together, and this is done by the two middle terms in what is regarded as a geometrical progression: in solid constructions *δύο ἀεὶ μεσότητες συναρμόττουσιν* (32b).

2. 2. The next section pretends to be concerned with the 'stars', or rather celestial signs, that mark the succession of the seasons. As there are seven seasons according to the writer, there must be seven heavenly signs; but he lists eight, arranged in four pairs. I cannot explain how he imagines the discrepancy to be justified. It is safe to say that here, at any rate, he does not know what he is talking about. What he has done is to take the four signs that conventionally marked the beginning of seasons, and provide each with a partner by free association. The sun by passing its equinox marks the beginning of spring, the rising of the Pleiades the beginning of summer, that of Arcturus the beginning of autumn, the setting of the Pleiades the beginning of winter

(*De Victu*, 3. 68). The long summer period is bisected by the rising of Sirius: medical theory assigned the more fatal class of fevers to the period between the risings of Sirius and Arcturus (*De Hebd.* 23). In *De Aer.* 11 the following times are specified as critical: the solstices, the equinoxes, the risings of Sirius and Arcturus (the latter practically coincides with the autumn equinox), and the setting of the Pleiades. With the sun the hebdomadist has paired the moon, with Arcturus the Bear that it watches, with the Pleiades the nearby cluster of the Hyades, and with Sirius his master and neighbour Orion. But the moon, which rises at all times of day in every season, and the Bear which does not rise or set at all, are totally unfitted for the service he would have them perform.[1] Real season-markers could be said to have an *ἀκολουθίην ἀλλήλοισι καὶ ἐναντίωσιν* (e.g. the rising of the Pleiades coincides approximately with the setting of Arcturus); but the moon does not follow the sun, nor the Bear Arcturus, nor the Pleiades the Hyades. The writer is trying to blind us with a science in which he is far from learned. What he is trying to say in the last sentence I have no idea, but that may not be his fault.

The Arabic translation of the opening of the paragraph, 'the wandering stars of heaven', is at variance with the identifications that follow, but it is symptomatic of the fact that we would naturally expect 'the stars of heaven which are seven in number' to be the sun, moon and planets. (Cf. references in Burkert, p. 289, n. 70.) This may be another hint that a planetary system is being adapted. Boll (p. 143) observed that *ἐναντίωσιν* would suit the planets, with their individual and sometimes retrograde movements. But his attempt to interpret the planets into the paragraph is very forced; it takes him a page to explain it.

3. Another series related to the seven seasons—though the relationship is not set out in detail, and hardly could have been—is constituted by the seven winds, obscurely but persistently connected with breath. They are said to start *ἀπὸ τοῦ θερμοῦ*, and the list accordingly begins at Apeliotes. East winds are warmer than west, according to Aristotle (*Mete.* 364^{a}24), because they are under the sun longer. Explanation of winds as arising from the action of heat, solar heat in particular, is common from Anaximander onwards (see O. Gilbert, *Die meteorol. Theorien des gr. Altertums*, 1907, 511 ff.), and in the Philolaus–Plato line of tradition we find breath connected with the heat of the body (Philol. A 27, Pl. *Tim.* 79d).

From Apeliotes we might have expected the writer to proceed clockwise, from warmer to colder, but he does the opposite. The composition of his list deserves attention. We should beware of the assumption that he has taken a symmetrical eight-point wind table and omitted one (A. Rehm, *SBBA* 1916 (3), 30 ff.; cf. K. Nielsen, *Classica et Mediaevalia* vii [1945], 20 ff.). For one thing we know of no such scheme earlier than Aristotle (*Mete.* 363^{a}21 ff.); for another, the only known system which would yield precisely this set of names is that of Eratosthenes (Galen in Hp. *De Humor.* 3. 13, xvi. 403 K.;

[1] The Chinese used the Bear's attitude as a guide to the seasons (Ginzel ap. Roscher [1911], p. 77; U. Holmberg, *Der Baum des Lebens*, p. 6), but the Greeks always use risings and settings. The moon and Bears perhaps occur in connection with a heptad of seasons in Heraclitus fr. 118 M. (B 126a), but the authenticity is very suspect and the meaning very obscure: *κατὰ λόγον δὲ ὡρέων συμβάλλεται ἑβδομάσι κατὰ σελήνην, διαιρεῖται δὲ κατὰ τὰς ἄρκτους, ἀθανάτου μνήμης σημεῖω.*

Gilbert, p. 549 n. 1), for all the rest, whether or not they distinguish Boreas from Aparktias, have Kaikias between these and Apeliotes. It is seldom proposed to bring *De Hebd.* down to the third century. With the exception of Aparktias, the names given by the hebdomadist are all known to Herodotus, and their stations come in the same order (assuming that Lips in 2. 25 is west of south): Apeliotes is north of east, 7. 188, cf. 4. 99. Aparktias first appears in Aristotle as an alternative name for Boreas. Both names, therefore, were in current use. The first dated authority to distinguish them is Timosthenes ap. Agathem. 7 (*Geogr. min.* ii. 473; Gilbert, pp. 548 ff.), in the time of Ptolemy II, and it is noteworthy that he agrees with *De Hebd.* in placing Boreas east of Aparktias. But no chronological conclusions can safely be drawn. Both sources may reflect a distinction discoverable in actual usage, despite Aristotle.

4. We come to the seasons themselves. The Greeks usually speak of two, three, or four seasons. The writer *De Victu*, 3. 68, says 'I divide the year into four parts, ἅπερ μάλιστα γινώσκουσιν οἱ πολλοί, winter, spring, summer, autumn.' This shows awareness of at least one alternative system, and it would be very interesting to know whether he knew this section of *De Hebd.* and had it in mind. In 1. 2 above, summer and winter were mentioned as an opposing pair, and appeared to be parallel to the warm and cold air of our breath. That would imply that they were thought of as states of the atmosphere; and here the Latin version agrees with ps.-Galen in saying that the seven seasons represent parts of the aither (?). 'Aither' seems to be the same as 'aer', as in Empedocles. The meaning that is suggested is that the air is divided into seven parts (we were told that each part of the cosmos has itself seven parts, though there is no systematic argument to this effect), with different properties and different effects on vegetation. They visit us in annual cycle, and they are closely connected with the seven winds; wind is simply air in motion, as was widely understood (Anaximander A 24, *De Flat.* 3, etc.). The 'passages of summer and winter' perforating the outer firmament may thus be related to the *respirationes* (Latin) or 'gates' (Arabic) of the seven winds. For the Greek original, obscured by a lacuna in our manuscript, Harder cleverly proposed ἀνάπνοιαι, which would imply orifices of some kind.

5. Human life too has its seven 'seasons', the so-called ἡλικίαι. For the parallelism of stages of life with seasons of the year cf. Pericles ap. Arist. *Rhet.* $1365^{a}32 = 1411^{a}2$; 'Pythagoras' ap. D.L. 8. 10, Diod. 10. 9. 5, Ov. *M.* 15. 199 (Thesleff, *Pythagorean Texts*, pp. 171, 233). Solon had divided man's life into ten seven-year periods (fr. 19 Diehl). The hebdomadist begins by following his account closely, but is resolved to limit the stages to seven; the later ones therefore have to be extended. The series is given in different forms by different sources. Besides Philo, two Latin writers refer to the teaching of 'Hippocrates' on this subject: Censorinus, *De Die Natali* 14. 3, and Favonius Eulogius, *in Somn Scip.* p. 9. 22 Holder (who specifies the *libri* περὶ ἑβδομάδων). The terminal ages are given as follows:

Philo	7	14	21	28	49	56	death
Censorinus	7	14	28	35	42	56	death
Favonius	7	14	21	28			
AP	7	14	21	35	49	63	98

The variants doubtless reflect contamination with other people's doctrines. Galen, for example, makes the *νεανίσκος*-period last till 35 (xvii (2). 644, 795 K.; cf. ps.-Galen, p. 59 B.). Evidence from the fifth or fourth century is hard to come by, but *De Carn.* 13 apparently puts the *νεηνίσκος* from the third to the fourth or fifth hebdomad, and it may be worth noting that the formula 36–49 (days) appears in the embryology of Empedocles (A 83).

6. In this important chapter the seven parts of the world are related to the parts of the body. This time we start from the middle. According to the first sentence, the parallelism extends to all animals, and trees too, but in what follows only man is considered. The nature of the relationship, if the Latin version may be trusted, is expressed indifferently in terms of similarity, imitation (of man by the world!), or identity. The stony interior of the earth corresponds to the bones, the weaker parts surrounding it to the flesh. The terrestrial waters correspond to the liquid parts of man: hot springs to the spinal marrow and semen, that according to widespread belief comes down from the brain (R. B. Onians, *Origins of European Thought*, pp. 109 ff., 121 ff., al.); rivers to the veins; ponds and marshes to the bowels; seas to the visceral fluids. The air is the breath in the body. The moon is the region of the brain (so *G*, who interprets as 'the seat of apperception'; the interpretation had intruded into the text from which the Latin version was made. The Greek phrase may have been *ὁ τοῦ ἐγκεφάλου τόπος*.) This equation is less obvious than the preceding ones. We have seen that the moon connects the mortal and immortal worlds, and has associations with reincarnation theory, and that the brain is the source of the semen. The Indian theory is that souls rising to the moon, if they are not pure enough to pass higher, are turned into rain and eventually (via plants and food) into semen. In *Early Greek Philosophy and the Orient* I argue that Heraclitus may have held a similar doctrine; and it would explain the equation of moon and brain in our passage. In Pl. *Tim.* 73bc it is the marrow, coming from the brain, that binds the immortal soul to the mortal body, a function comparable to that which the hebdomadist assigns to the moon.

The sun, we were told, is notable for heat; it corresponds to heat in the body. But the author is in trouble here. The body's heat is well distributed through the inner parts. There are the stars to be accounted for as well, before we reach the cool outer skin. We are instructed that some of the solar heat is united with the earth: this is the inner heat in man, while the heat in the upper regions of the world, represented by the sun and stars, is the heat near the surface of the body, which glows in consequence of rapid motion and produces visible changes of complexion, 'just as up there you will find *Ζεὺς αἰγίοχος*'. Interpretation of Zeus as the sky or aither is common enough from the fifth century on (cf. Burkert, p. 327, n. 72); what we have here is an interpretation of one of his traditional epithets (apparently applied to the elemental Zeus in Emp. B 142, but perhaps ornamentally). One ancient interpretation of *αἰγίοχος* was based on the use of *αἰγίς* for a squall (so Cornutus, 9 p. 9 Lang; Nonn. *D.* 2. 420–1; Eust. in Hom., pp. 602. 18, 1017. 37, 1119. 28 ff.), but this loses the connection with the sun and stars. Another explanation recorded in *Et. Magn.* 27. 34 is that Zeus wore a goatskin, and this might have been built upon in a cosmological allegory: in Apollodorus *π. θεῶν* 244 F 136 Pan is identified with *τὸ πᾶν*, his ruddy face with the aither, and his fawnskin

with the ποικιλία τῶν ἄστρων καὶ τῶν ἄλλων χρωμάτων ἃ θεωρεῖται ἐν αὐτῷ (sc. τῷ παντί). (Cf. Orph. fr. 238. 5–7, from the late poem *Bacchica*.) Certainly the planet Jupiter has no business here (against Kranz, pp. 125 f./168 f.). A minor puzzle is how the Arabic version of ps.-Galen has come to turn Zeus into 'the Saturn that is there, that moves and circles'; the commentator says the sun is meant. Saturn in Greek would be *Φαίνων*, or *Κρόνου* or *Ἡλίου ἀστήρ*. Perhaps the participle *φαίνων* appeared somewhere here.

The following sentence about the Bear raises further difficulties, textual and exegetical. The Latin copies give *arcturius* and *ero hos*; the latter points to *arctos* (Kranz) rather than *arcturus*, and ps.-Galen apparently read ἄρκτοι. He makes the sun lead them (whatever that may mean), so it looks as if the last phrase in the Latin, *quae e sole nutrita*, refers to the feminine *arctos*; it is the translator's way of dealing with a Greek article, ἡ ὑπὸ τοῦ ἡλίου -ομένη (τρεφ-, v.l. στρεφ- ?), as above we have *quae minima et quae magna* for τά τε μικρότατα καὶ τὰ μεγάλα or the like. The reference might be to the reflected nature of starlight (1. 2). The Bear or Bears mark the pole about which all the stars revolve. Perhaps the idea is that they supervise the circling of the stars (= the changing colours of the skin), being themselves dependent on the sun (= the heat lower down). American Indians treat the Pole Star as the leader of the other stars, and great importance is attached to it in other places (U. Holmberg, *Der Baum des Lebens*, pp. 6 f.); cf. Critias 88 F 18–19. I have considered possible connections with the mention of the Bear in chapter 2, without finding a plausible one.

To illustrate the analogies drawn between cosmos and animal we must turn once again to the *De Victu* and *Timaeus*, though Kranz has pointed to an earlier parallel, the two fragments of Choerilus which refer to stones as 'earth's bones' and to rivers as 'earth's veins'. Tzetzes' citations do not betray the metre, but a plausible combination with an anonymous quotation in Eustathius supports ascription to the tragedian Choerilus who was apparently about contemporary with Aeschylus (p. 719 Nauck) and not to the epic poet of the late fifth century (p. 271 Kinkel). In *De Victu*, 1. 10 a systematic scheme is worked out. The parts of the body are formed in imitation of the universe: ἀπομίμησιν τοῦ ὅλου, μικρὰ πρὸς μεγάλα καὶ μεγάλα πρὸς μικρά (cf. *De Hebd.* 6 at the beginning). The κοιλίη ἡ μεγίστη has the power of the sea. Surrounding it is a formation of which the description is remarkably obscure, but it is an imitation of the earth, and seems to comprehend the flesh generally (cf. 4. 89. 11, 90. 3, 6). In it there are triple circuits (περίοδοι) of fire which 'abut on each other inside and outside', i.e. they are concentric. Those nearest the fluid reservoir represent the power of the moon, those nearest the containing concretion (πάγος) the power of the stars, and those in between, the power of the sun. Further particulars can be added from 4. 89–90, where the system is used as a basis for medical interpretation of dreams. The breath in the body is equated with the air in which cloud, rain, hail, and so on occur (89. 2, 13). The veins are rivers, the bladder a well (90. 4–5). Despite some differences of detail from the *De Hebd.*, it will be evident that the scheme is closely related to it. All seven of the hebdomadist's world parts are present, and only the moon is given a materially different analogue in the body—one more in accord with its location in the cosmos, but less meaningful functionally.

The *Timaeus* too has this strange idea of the heavenly bodies' περίοδοι being built into the human body (43a), though they are not the same in number as

in the two Hippocratic works, and the rest of the system is not worked out. The cosmic analogy has psychological, not physiological import, and reflects an altogether more abstract line of speculation, but the cruder physiological scheme presumably lies behind it.

7. Next we are offered what appears as an alternative division of man into seven parts according to his outward form. But the heading is misleading. We would expect such a division to give us head, chest, belly, two arms and two legs (so Philo, *de opif. mundi*, 118, i. 41 C.–W.). What we are actually given is rather a list of seven organs of interaction between the body and its environment: the head, whose various offices will be specified shortly; the hand for action; the σπλάγχνα and φρένες; the penis as the outlet of the urine; the same as the organ of generation; the rectum for the evacuation of solids; the leg for walking about. The second, third, and seventh items would each have been more naturally counted as two, so that it looks as if an original list of ten may have been compressed to make one of seven. The principle of this canon of key points, though not the detail, may be compared with Philolaus B 13, where the four ἀρχαί of the intelligent creature are specified as the brain, the heart, the navel, and the penis: ἐγκέφαλος μὲν νόου, καρδία δὲ ψυχῆς καὶ αἰσθήσιος, ὀμφαλὸς δὲ ῥιζώσιος καὶ ἀναφύσιος τοῦ πρώτου, αἰδοῖον δὲ σπέρματος καταβολᾶς τε καὶ γεννήσιος. The number ten seems to be of special interest to Philolaus (A 13, 16, B 11), and possibly Archytas if the περὶ τῆς δεκάδος ascribed to him was genuine.

8–9. The idea that each member of a set of seven can itself be divided into seven is here brought back into play. The first of the seven vital organs just listed, the head, has seven functions of its own: inhalation, exhalation, sight, hearing, smell, ingestion, and taste. Respiration is described as the entry of the cold 'through any part that is open' (perhaps a mistranslation, e.g. of ᾗπερ δὴ ἐσέρχεται), and the exportation of heat from the whole body. Thermal exchange is treated as the essence of breathing by Philolaus (A 27), *De Victu* (1. 10, 23), and the *Timaeus* (78–9). For the association of vision particularly with colours cf. *Tim.* 67c. The sixth entry betrays the common ancient belief that drink goes down the windpipe to the lungs (Alc. 347 (a) 1 L.–P.; Wellmann on Philistion fr. 7 (*Fragmentensammlung d. gr. Ärzte*, i. 112); Taylor on Pl. *Tim.* 70c).

'And the voice itself has sevenfold articulation'—as if speech had been mentioned among the offices of the head, as it well might have been. What makes this more suspicious is a similar passage in *De Victu*, 1. 23, where it is remarked that sense-perception takes seven forms: hearing, sight, smell, taste, speech, touch, and θερμοῦ ἢ ψυχροῦ πνεύματος διέξοδοι ἔξω καὶ ἔσω. The writer seems to have borrowed the list, if not from *De Hebd.*, from something very like it, and presented it as what it is only in part, a list of the senses. It comes in a series of illustrations of the thesis that the arts and crafts imitate cosmic realities (1. 11–24; cf. Philolaus B 11). The parallel to the transmission of knowledge by seven ways is the art of writing: both admit the formula δι' ἑπτὰ σχημάτων ἡ γνῶσις. In the case of writing the reference is presumed to be to the seven vowels αεηιουω, though it is an odd statement. The *De Hebd.* may have used a similar expression. Ps.-Galen gives 'the voice is divided into seven parts' or 'is made clear'. The commentary explains that the vowels are meant; as

in other places, the explanation has intruded in the Latin text. In both Hippocratic works, then, these seven elements of language are mentioned in close association with the seven functions of the head, or the seven senses. The association is more artificial in *De Victu*, and the heptadic principle less integral to the plan of the work, so that the version of *De Hebd.* seems to be either the original or a close relation thereof. The latter alternative rather than the former is suggested by the (evidently secondary) exclusion of the voice from the list of functions.

10. The soul (*anima*, sc. ψυχή) likewise has seven parts, i.e. it is a mixture of seven substances. The first is warmth. The text is uncertain here, but ps.-Galen and the parallel of 1. 1 indicate the sense. *Quod in aere et quod in animalibus* = τό τε ἐν τῷ ἠέρι καὶ τὸ ἐν τοῖς ζῴοισι, the same idea as seems to lurk in 1. 1 *in corpore eorum quae in omne*. Perhaps the meaning is that a newborn child is very liable to die within seven days (Arist. *Hist. Anim.* 588[a]8), and so is a fire. The second substance is the cool of the air that we breathe in, cf. 8. The third is moisture, distributed throughout the body, cf. the several fluids specified in 6. 1. The fourth is earthy; the Latin text identifies it as the blood (= the interpretation of ps.-Galen), and this may be right. In 6. 1 the blood was counted with the fluids, and it was the bones and the flesh that corresponded to earth, but the present account is of the soul, and although the soul is being conceived materialistically, it is unlikely to include bones and flesh. The writer wants to find an earthy element in it for the sake of his scheme, and blood may have been the thickest and earthiest of the parts that he would regard as belonging to the soul. (It is a quarter earth, according to Empedocles B 98.) We would certainly expect it to appear in his list. The detail that it is the earthy element that needs food may suit the blood, cf. Pl. *Tim.* 80de, 82c. The fifth ingredient is bitter bile, the sixth sweet nourishment, the seventh τὸ ἁλμυρόν. Health depends on the proper balance of these seven, which a man can maintain by good regimen.

The Presocratics often gave a materialistic account of the soul, though mostly in terms of a single substance, fire or air. D.L. 9. 29 ascribes to Zeno the doctrine that the soul consists of hot, cold, wet, and dry in balanced proportions. This is followed by an apophthegm elsewhere attributed to Empedocles, and perhaps the paragraph as a whole should be referred to Empedocles; the recipe for soul corresponds with Empedocles' recipe for blood (B 98), which was the seat of consciousness (B 105), and although he cannot have equated the soul with the blood, Aristotelian interpretation seems to have made him do so (A 78, B 109). Macrobius' statement that Xenophanes derived the soul from earth and water (A 50) is a perversion of B 33, and his statement that Parmenides derived it from earth and fire (A 45) is equally unreliable (cf. B 8. 53 ff. +B 16 +Aet. 4. 5. 12 (A 45)). The *De Victu* says that the soul contains a mixture of fire and water (1. 7). The hebdomadist makes it a compound of bodily powers or opposites of the kind that medical theory had assumed at least from the early fifth century (Alcmaeon B 4; *De Morbo Sacro* 17, 21; *De Nat. Hom.* 2–3; Philolaus A 27; *De Vet. Med.* 14–16, 22, 24; Philistion fr. 4, etc.; cf. Kahn, *Anaximander*, pp. 126 ff.). He starts with the famous tetrad hot, cold, wet, dry, which show signs of equation with fire, air, water, and earth—an equation first found in this simple form in Philistion l.c. To make a heptad he adds bitter, sweet and salty. Bitter and sweet are the opposites most com-

monly mentioned, after hot–cold and wet–dry; the report of Alcmaeon speaks of *ὑγροῦ, ξηροῦ, ψυχροῦ, θερμοῦ, πικροῦ, γλυκέος καὶ τῶν λοιπῶν*. But these too, at least the bitter and the sweet, are identified with particular things. We may note the doctrine of *Tim.* 74c that the flesh is compounded from water, fire, earth, and a *ζύμωμα ἐξ ὀξέος καὶ ἁλμυροῦ*.

11. It is now the turn of the earth's surface to be divided into seven, and to complicate things, the seven parts are to correspond with parts of the body. It was on this chapter above all that Roscher based his sixth-century dating. That period, he maintained, was indicated by the omission of the Asiatic kingdoms and the whole of the west from what he persistently called the 'world map', and by the designation of Ionia as the *φρένες* of the earth, and of the Peloponnese as the habitat of great souls. He even argued that the Isthmus as the neck of the earth was peculiarly appropriate to the prosperity of Corinth under Periander. Extraordinary to relate, it was left to Boll to point out that the equivalences take their starting point from the physical shape of Greece. In discussing the chapter we must ask firstly on what principle man is here divided up, secondly on what basis countries have been chosen to correspond with his different parts, and thirdly what is the status of the remarks about their inhabitants.

The seven parts of man are here head, neck and spine, *viscera* and *praecordia*, legs, feet, belly, and rectum. The list differs from that in 7, there are remarkable omissions (arms; the whole casing of the trunk), and the last two items are out of order. The identification of head and neck with Peloponnese and Isthmus is given by geography. Roscher quoted examples from Herodotus onwards of *αὐχήν* being applied to a neck of land. Conversely, *Tim.* 69e describes the neck as an *ἰσθμὸς καὶ ὅρος τῆς τε κεφαλῆς καὶ τοῦ στήθους*. *ἴσθμιον* 'necklace' occurs in the *Odyssey*. Now, where will the *viscera et praecordia* be? Remembering from 6. 1 that they are full of liquid, which corresponds to the sea, we shall not be upset to find them identified with Ionia, provided we include the islands under that name. (Then presumably Attica too, as in Solon 4. 2 D.; H. Philipp, *Woch. f. kl. Phil.* xxx [1913], 667.) The Thessalian–Thracian coast will delimit the man's body on one side. His legs are the Hellespont; they must surely extend along the sides of the Propontis, not just the straits at its entrance. The name Hellespont is so used by Herodotus and in the Athenian tribute lists. The feet are then at the Bosporus, where the coast turns outwards on each side. 'Thracian and Cimmerian' is an absurd gloss, appearing in *G* as 'either the Thracian or the Cimmerian' (sc. *ἤτοι . . . ἢ . . .*). So far, so good. But the two parts of the body that are out of place in the series are assigned to quite preposterous localities, right outside the area covered by the rest of the man. They must have been added by someone who did not understand the geographical basis of the original scheme at all. (R. Ganszyniec, *Eos* xxxv [1934], 116.) If the hebdomadist is responsible, the map-man's origin must be sought in some older source.

In the Latin text the inhabitants of the Peloponnese are characterized in a way appropriate to their dwelling in the head. In ps.-Galen there appear corresponding remarks about the inhabitants of Ionia, the Bosporus, and the Euxine, and notes about the Hellespont, Egypt, and the Crimea (?) as places. It is not quite certain that these are all excerpts from the text of *De Hebd.* rather than part of the commentary, but it looks as though this chapter suf-

fered some abridgment before the Latin version was made. Originally there may have been something like a systematic relation of each region or its people to the part of the body supposed to be represented by it. The 'great souls' of the Peloponnese may suggest either the kings of the Bronze Age who continued to be venerated as heroes, Agamemnon, Menelaus and the rest, or the 'Laconomania' of the late fifth and early fourth centuries. The connection of head with soul is primitive; cf. e.g. the variant κεφαλάς/ψυχάς *Il.* 1. 3, 11. 55, and Onians, *Origins of European Thought*, pp. 95 ff. The seat of intelligence is located in the breast, as we see from the annotation on the Ionians (to which it is rash to try and set a date). The feet appear as organs of aggression (cf. Archil. fr. 49 Tarditi πόδες δὴ κεῖθι τιμιώτατοι, or the apophthegm of Aristotle quoted with it by Plut. *De Garrul.* 503a). The equation of 'Egypt and the Egyptian sea' with the belly is justified with a reference to the fertility of the Nile-land. One might have expected rather the people to be called greedy good-for-nothings (γαστέρες); they had a reputation for πανουργία (see Gow on Theoc. 15. 48), and it would not have been difficult to relate them to the belly. The last of the seven regions is called *Euxinus Pontus et palus Maeotis* in the Latin, and a sea suits the *venter inferior* (= ἡ κάτω κοιλίη); ps.-Galen, however, speaks of a great island—most likely the Crimean peninsula—which collects the refuse of earth and sea, and whose people are weak and servile. We think of the description of the Scythians in *De Aer.* 18–22, except that Maeotis is the very district where a much more warlike tribe is found (ibid. 17).

12. Concluding the cosmological part of his work, the writer claims to have expounded the nature of the universe and of man. It is such that all creatures' ailments are necessarily parallel to those of the world as a whole, as will be shown in due course. The cosmology is necessary for the understanding of what follows. A full exposition would call for a physical treatise (*ratio naturalis* = φυσικὸς λόγος), but the present account explains the natural structure of things, in the light of which everything must be considered.

The Composition of the Whole

'Die ersten elf Kapitel sind ein Ganzes (vom Schlusskapitel abgesehen), aus einem Guss und ganz folgerichtig aufgebaut' (Kranz, p. 137/177). This is by no means my impression. I see a sharp contrast between two strata of composition. On the one hand there are chapters 1. 1–2. 1, 6, 10, 12, forming a coherent and systematic whole. 1. 1, the world has seven parts, and so has its members. 1. 2, account of the seven parts of the world, ending with earth. 2. 1, the interrelation and movement of the parts. 6, the corresponding seven bodily parts in earth's creatures. (*In terra* seems to connect with 1–2.) 10, the seven parts of the soul, on which health and sickness depend. 12, we shall find the parallelism of man and the world operating in disease too. Interrupting this argument, in chapters 2. 2–5, 7–9, 11, we have a ragbag of further heptads, none of them related to the conception of man as an integrated whole. An ordering principle can be seen: the section on seasonal stars is tagged on to the account of cosmic revolutions, and the winds, seasons and ages follow in a natural enough sequence, though there is then a complete break between 5 and 6. 7 competes awkwardly with 6, but 8 and 9 develop well

enough from 7. Then another break between 9 and 10, while 11 is quite isolated. All these parts except 9 may be said to have potential medical relevance. The doctor is elsewhere taught to pay attention to the seasons and the stars that mark them (*De Aer.* 1–2, 10–11; *De Nat. Hom.* 7–8; *De Hebd.* 16, 23; *De Humor.* 13–19; *De Victu*, 1. 2, 32, 3. 68; *Aphor.* 3. 1–23), to the winds (*De Aer.* 3–6; *De Morbo Sacro* 16; *De Humor.* 14; *De Victu*, 2. 38), to the ages of life (*De Humor.* 16; *De Victu*, 1. 2, 32–3; *Aphor.* 3. 24–31), to geographical factors (*De Aer.* passim, with application to particular countries in 12–24; *De Humor.* 12; *De Victu*, 1. 2, 2. 37–8). But the hebdomadist's interest in these topics seems to be more mystical than practical. Chapters 1+6+10+12 are capable of development into a theory of diagnosis and therapy, however mistaken; it is hard to see how the rest could have been. I infer that they have a different origin.

Now the writer of *De Victu* is acquainted with a system closely resembling that of 1–2, 6 (though he has nothing to say of its heptadic character), and also with a scheme similar to that in 8–9 but free from an anomaly which is a feature of the relationship of 9 to 8. The commentary has shown up other such anomalies at the very beginning; in the inapposite heading of 7; and in the last two items of the list in 11. These all come in the short, miscellaneous sections, and two of them (7, 11) are connected with the adaptation of older, non-heptadic series. We may say, then, that these sections collectively, in their present form, reflect a later stage of development than what is presupposed in the *De Victu*. What the author of that work knew was not our *De Hebd.*, but some of the material from which it has been put together. What we have before us is a compilation, in which several ingredients may be distinguished in the light of the above observations.

(*a*) A well-worked-out macro-microcosmic system, expounded in an artistic variety of prose (1–2. 1, 6, 10, 12).

(*b*) Heptadic catalogues current before *De Victu*: the functions of the head (8), the vowels (9); perhaps others.

(*c*) Non-heptadic catalogues adapted by the last compiler: the key points of the body (7), the equation of bodily members with parts of the earth (11); perhaps others. (The seven seasons are built up from the customary tetrad, the seven ages of life reduced from Solon's decad, but we cannot tell whether this is due to the compiler or had been done before him.)

The compiler's procedure has been to take the nucleus (*a*), and augment it with the more random collection of heptads, for the sake of illustrating the cosmic significance of seven as fully as possible. What has happened in 1. 1 is not clear, but here too we may see his interfering hand.

Dating

It follows that there can be no simple answer to the question 'what is the date of *De Hebd.*?' We must ask how old each of its constituent parts is, and when they were put together in their present form.

Let us take first the rather grand system that forms the nucleus. It is immediately obvious to what line of cosmological speculation it must be assigned: the line that runs from Empedocles to Philolaus and Plato, and may for convenience be dubbed Pythagorean, provided we do not attempt to trace it back to the earlier part of the fifth century. (Parmenides' system is notoriously

obscure.) What appears in *De Hebd.* is apparently modelled on an astronomically more sophisticated scheme which included the individual planets (see on 2). We must not attribute *this* reworking to the compiler, for it is presupposed in the physiology of chapter 6, and in the *De Victu*. No such planetary scheme, and no knowledge that there are five planets, can be traced earlier than Philolaus (A 16). It is noteworthy that he too is at pains to fit his cosmology to a magic number, ten. A striking feature of his system that *De Hebd.* does not share is the displacement of the earth from the centre and the assumption of an Antichthon. His central fire is not counted among the ten, which are: Antichthon, earth, moon, sun, five planets, Olympus. The system behind *De Hebd.* could in principle be earlier. But the idea of reflected starlight is against raising the date by much. The assumption of a lower half of the universe symmetrical and opposite to the visible upper part, and the way this is expressed, again has its closest parallel in Philolaus. This bivalve picture is not as sophisticated as the spherical earth, needing no support from air, which first appears in Plato's *Phaedo* and was soon widely accepted. We should beware of assuming that our cosmologist was necessarily abreast of the latest speculation, but his scheme looks remarkably like a product of the latter part of the fifth century. A linguistic detail that perhaps suggests the fifth rather than the fourth century for this section is the concrete use of a noun in *-σις* (*τὴν ἄστρων μάνωσιν*), for the suffix was rapidly becoming specialized in application to processes; see R. Browning, *Phil.* cii (1958), 60 ff.

The heptadistic remodelling was undertaken by someone to whom planets were newfangled nonsense: sun, moon, and stars made a good enough division for him. His interests were medical, and he was concerned with the macrocosm primarily as a parallel to the structure of the human body. It would have been difficult to find analogues for five planets at different levels as well as sun, moon, and stars. Besides, seven was his appointed number. (Belief in the power of seven in connection with critical days must already have been established in his field; cf. the series in *Progn.* 20, *Epid.* 1. 26, *De Carn.* 19, *De Hebd.* 26; Roscher, 'Hebdomadenlehre', 60 ff.) As to when he operated, we can say with confidence that it was before the writing of the *De Victu*. Kirk, *Heraclitus*, pp. 26–9, shows that no date for this work earlier than the mid fourth century is likely. I would add that 1. 18 *ἁρμονίης συντάξιες ἐκ τῶν αὐτῶν οὐχ αἱ αὐταί, ἐκ τοῦ ὀξέος καὶ ἐκ τοῦ βαρέος . . . τὰ πλεῖστα διάφορα μάλιστα συμφέρει* κτλ. echoes Heraclitus fr. 27 M. (B 51) as interpreted by Pl. *Symp.* 187ab, and that 2. 38. 3 presupposes a spherical earth divided into polar, temperate, and tropical zones, a doctrine not reliably attested before Eudoxus fr. 288–9 Lasserre and Arist. *Mete.* 362^{b}. A *terminus ante quem* may be drawn from an apparent criticism of the work by Diocles, whom Jaeger put in the later fourth century, but a more recent researcher has put back up to the middle of the century (F. Kudlien, *Arch. f. Gesch. d. Medizin* xlvii [1963], 456–64). We shall not go far wrong if we assign *De Victu* to the same period. The author of the macro-microcosmic system of *De Hebd.*, then, might be put anywhere in the first half of the century. The only other clue that I can see is the coincidence with Philistion noted on chapter 10. Philistion was old enough to teach Eudoxus, and may have been approximately Plato's contemporary.

I see little prospect of dating the various heptadic and other catalogues that the compiler has used, except that the pair in 8–9 were formulated, and associated with each other, before the *De Victu*. If anyone wishes to date 3 (the

winds) to the third century on the basis of the facts mentioned in the commentary on that section, he may, though it does not seem necessary. The list in 7 was in two ways reminiscent of Philolaus. As for 11, the reference of the names *Ἰονίη* and *Ἑλλήσποντος* suggests a date not later than the fifth century for the original.

The *terminus ante quem* for the compiler is Philo, since Roscher's claims to find earlier references to the work are far-fetched. But Philo knew it as a work of the wise Hippocrates, and it must have borne his name in the Alexandrian library. It is natural to suppose that the compiler was not far removed in space or time from the author of *De Victu*, where some of the things that he combines appear separately. We see from Aristotle, *Metaph.* 1093^{a}13–16, that people had been collecting heptads more indiscriminately by his time. He mentions the seven vowels, the notes of the scale, the Pleiades, the loss of first teeth in the seventh year, and the Seven against Thebes. Two of these items appear in the *De Hebd.*, but not only there, and there is no reason to think that Aristotle knows this particular work. Nor can anything be inferred from its omission of his other items, any more than from its omission of the Seven Sages (Pl. *Prot.* 343a), the Seven Great Islands (Alexis fr. 268, Timaeus 566 F 65), or countless other possible sevens. They have not the association with medical philosophy that it was possible to find in all the sets that are present.

Relation to Non-Greek Speculation

In 1923, A. Götze published a remarkable article entitled 'Persische Weisheit in griechischem Gewande' (*Zeitschr. f. Indologie u. Iranistik*, ii. 60 ff., 167 ff.). In it he pointed out some striking parallels between the 6th chapter of *De Hebd.* and the 28th of the *Greater Bundahišn*, a Zoroastrian cosmological work of the ninth century A.D. The latter is certainly based on an older Persian source; Götze argued that it was directly used by the writer of *De Hebd.* He described the Hippocratic work as 'an erratic block in Hellas'. I will conclude my study with a brief discussion of its relationship to the *Bundahišn* and to other non-Greek material.

We have seen that in general, far from being an erratic block, it is put together from parts that very obviously belong in a known tradition of speculation, the Pythagorean or western tradition. Preoccupation with number is itself a characteristic of that tradition. As for the number seven, there is no period at which its significance in Greece cannot be illustrated, as the peruser of Roscher's 'Hebdomadenlehre' will see. But it is in Pythagoreanism that it is first consciously formulated. Philolaus B 20 hails the seven as divine leader and ruler of all, eternal, stable, unmoving, like itself and different from others. In the fourth century heptadism was on the increase, as we see from Aristotle, and in later centuries it becomes ever more elaborate.

In approaching the question of non-Greek material, then, we should not think in terms of any direct influence upon the work before us, but at most of the absorption of such material into a certain current of Greek thought at an earlier period. We have seen that the macro-microcosmic comparison, with which Götze is occupied, is hinted at in the first half of the fifth century—only in a couple of poetic kennings, but enough of the idea is present for the developed system of *De Victu* and *De Hebd.* to be explicable without postulating any further model. But at this point we had better distinguish between different kinds of parallelism between world and man.

1. The world may be represented as the body of a god. His head is sought at the top of the universe, the sun and moon are his eyes, the earth and sea correspond to his lower parts, or he may extend to a region below the earth. This type is particularly well established in Indian literature from the earliest times; see R. Reitzenstein and H. H. Schaeder, *Studien zum antiken Synkretismus*, Stud. d. Bibl. Warburg vii (1926), 69–103; A. Olerud, *L'Idée de Macrocosmos et de Microcosmos dans le Timée de Platon*, Diss. Uppsala, 1951, 128 ff. There are traces of it in Iran (J. Duchesne-Guillemin, *RE* Supp. ix. 1585) and perhaps Mesopotamia (T. Jacobsen in H. Frankfort et al., *Before Philosophy*, 145 f.). In Greek I may refer to the Pythagorean aphorisms 'the Bears are the hands of Rhea' and 'the sea is the tear of Kronos' (though no single god is here coextensive with the universe); to Aeschylus' *Ζεύς ἐστιν αἰθήρ, Ζεὺς δὲ γῆ, Ζεὺς δ' οὐρανός, Ζεύς τοι τὰ πάντα χὤτι τῶνδ' ὑπέρτερον* (fr. 105 Mette); and to the cosmic deity whose human shape is explicitly denied by Xenophanes (B 24, 26) and Empedocles (B 27–31, 35. 11 ff., 134). For the Stoics, the world is still identifiable with Zeus (*SVF* ii. 169. 32, iii. 217. 9), and in Orph. fr. 168. 6–30 we have a full description relating the parts of the world to the members of an anthropomorphic Zeus (who has horns and wings, implying Hellenistic syncretism).

2. The traditional personification of the earth may be elaborated. In Pherecydes the visible surface of the earth is the robe of Chthonie, and the *Peplos* of the fifth-century Pythagorean poet Brontinus may have developed this further (cf. Epigenes in Orph. fr. 33). Choerilus properly belongs under this heading, as he talks of the bones and veins of earth, not of the universe.

3. The parts of the universe may be treated as having a likeness with the several parts of man, without regard to their relative position. So in the *Greater Bundahišn*, despite a series of agreements with *De Hebd.* Man is a copy of the world. His flesh is as the earth, his bones like the mountains, his veins like the rivers, his blood like the water of the sea, his belly like the sea, his breath like the wind, his marrow like metal, his rectum like the hell under the earth; this is all in order. But his back is like the sky, his hair like vegetation, his fingers and toes like the planets and signs of the zodiac, his intestines like the clouds and Vāzišt fire, his eyes like the sun and moon, his teeth like the stars. Once you start such a list, many equivalences suggest themselves, and it may be doubted whether the agreements with *De Hebd.* really call for the assumption of a common source containing all the same details. In 2 *Enoch* 30. 8 (ii. 448 Charles) God creates Adam's flesh from earth, his blood from the dew, his eyes from the sun, his bones from stone, his intelligence from the swiftness of angels and from cloud, his veins and hair from the grass, his soul from his own breath and the wind. The myth had a long career in the Middle Ages, and survives in folklore today; cf. R. Köhler, *Kl. Schr.* ii (1900), 1–7; M. Förster, *Arch. f. Religionsw.* xi (1908), 477–529; Boll, *Aus der Offenbarung Johannis* (Stoicheia, i), 1914, 62 f.

4. The whole universe may be treated as an organism with working parts similarly arranged as in man. This is the most sophisticated type. It is best illustrated by the *De Victu*; the system of *De Hebd.* is an almost perfect example, but the moon–brain equation shows an element of type 3. The sequence moon–sun–stars–crust, by the way, is quite different from the standard Persian arrangement, stars–moon–sun–Beginningless Light.

The basic idea of a parallelism between the world and the human form, type 1, may well have come to Greece from the east, in the sixth century. After that, however, independent development seems sufficient to account for the phenomena.

In connection with *De Hebd.* 11, Boll and Philipp independently compared a passage of the *Kore Kosmou*, one of the Hermetic treatises of which substantial excerpts are preserved by Stobaeus. It is fr. 24. 11 ff. (iv. 55–7 Nock–Festugière), where Isis tells Horus that the earth is like a man lying on his back with his head to the south. His heart is where Egypt is, at the centre, and for this reason the Egyptians are *πάντων νοερώτεροι καὶ σώφρονες*. Those to the south have good heads and hair; those to the east, where the right hand is, are warlike, Sagittarians; those to the west are left-hand fighters, good in defence; those in the north have good feet and legs; while those in front of them, round Italy and Greece, have such attractive thighs and bottoms that they are drawn to homosexuality. As in *De Hebd.*, national characteristics are related to parts of the map-man's body. No other such parallel has been adduced from elsewhere.

The Hermetica are more Greek than Egyptian, and one cannot assume that something is Egyptian just because it comes in the *Kore Kosmou*. But the idea that the earth is a male figure lying on his back is genuinely Egyptian: Geb the earth-god lies on his back, with Nut the sky-goddess arched over him. Isis says that the earth *ἐμβλέπει οὐρανῷ καθάπερ πατρὶ ἰδίῳ, ὅπως ταῖς ἐκείνου μεταβολαῖς καὶ αὐτὴ τὰ ἴδια συμμεταβάλλῃ*: the earth has no father in ordinary Greek tradition, but according to Heliopolitan theology Geb has a father, namely Shu, the air or wind that divides him from Nut. Nothing could be more natural than the assignation of different lands to the limbs of Geb. Gaia is personified in Greece, of course, and she has her navel at Delphi, but we do not find pictures of her as a supine figure; the Greeks did not imagine her in such literal anthropomorphic terms. The evidence is not sufficient for us to assert that the map-man must have originated in Egypt, before *De Hebd.*, and come to Greece from there, but it is certainly a possibility.

Lastly, the heptadism itself. Number superstition is primitive and widespread. Much interesting material on this subject is referred to by Burkert, pp. 441 ff. In Greece it was the Pythagoreans in the fifth century who raised whatever was there before to philosophic status. In particular, the idea that a certain number is to be found throughout the universe appears. 'Every thing is three things, neither more nor less. Each thing's quality is a trinity: *σύνεσις, κράτος, τύχη*' (Ion of Chios B 1). Did this way of looking at things come from abroad? In the *Bṛhadāraṇyaka Upanishad*, which it is thought cannot be later than 600 B.C., we read, 'This universe is a triad—name, form and work' (1. 6. 1, trans. Zaehner), as it were *ἑνὸς ἑκάστου ἀρετὴ τριάς, ὄνομα καὶ εἶδος καὶ ἔργον*. Not much later, in the *Taittirīya Upanishad*, we find a passage conceived in disturbingly similar spirit to the *De Hebd.*:

> Earth, atmosphere, sky, the points of the compass, the intermediate points.
> Fire, wind, sun, moon, constellations.
> Water, plants, trees, space, the Self.
> So much for the material world; now we come to the self:—In-breath, out-breath, diffused breath, upper breath, concentrated breath.
> Sight, hearing, mind, speech, touch.

Skin, flesh, muscle, bone, marrow.
After breaking it down into these categories an ancient seer remarked:
'Surely the universe is of fives. By the fivefold one preserves the fivefold.'

(1. 7.) There is much in the Upanishads for which I insist on a historical connection with some of the teachings of Greek philosophers in the late sixth and early fifth centuries, and this number speculation fits so well into the overall picture that it is natural to find a connection here too. This does not necessarily mean attributing the common pattern of the *Taittirīya Upanishad* and the *De Hebd.* to an archetype. Once speculation had been given an impetus in this direction, it might develop on parallel lines in different countries.

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