

Who is attacked in On Ancient Medicine?

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*On Ancient Medicine*¹ is generally acknowledged to be a document of the first importance for our understanding of the development of early Greek thought. Yet the problem of its relation to the medicine and philosophy of its time is still a very open one. In their editions of the treatise both W. H. S. Jones² and A. J. Festugière³ discuss some of the conflicting opinions of earlier writers who tackled this question. H. Wanner,⁴ for example, following Wellmann,⁵ thought that the author showed Pythagorean and Cnidian influences, although W. A. Heidel⁶ asserted, on the contrary, that the treatise 'bears none of the marks of the Cnidian school.' Jones himself⁷ considered the writer an eclectic 'ready to adopt views from any thinker or school of thought that appeared likely to prove of value to a practising physician.' He mentioned Dexippus, Philolaus, Petron and the authors of *On Generation*, *On Diseases IV*, *On Affections* and *On Diseases I* as theorists who held views similar to those attacked in *VM* ch 1, and concluded⁸ that 'it is quite likely that the author had no single individual in mind, but was combating all thinkers who attached undue weight to the effect of the four traditional opposites on bodily health.' Festugière⁹ also thought that *VM* is attacking a whole medical school, rather than any particular individual, but he referred to a rather different group of writers to illustrate the school in question, namely Philistion, the authors of *On Regimen I* and *On*

¹ Except where noted, the text of *VM* I use is I. L. Heiberg's (*Corpus Medicorum Graecorum*, Vol. I, 1 Leipzig 1927). Other Hippocratic treatises which are not included in CMG I, are cited according to the edition of E. Littré (10 Vols, Paris 1839-1861, referred to with the initial L followed by the number of the volume in Roman numerals). I quote the text of Anonymus Londinensis as given by Diels (*Supplementum Aristotelicum* Vol. III, 1 Berlin 1893) including his signs for uncertain letters (dots underneath), abbreviations (round brackets), his own restorations (square brackets) and so on.

² *Philosophy and Medicine in Ancient Greece*, Suppl. to the Bulletin of the History of Medicine 8, Baltimore 1946, 45ff.

³ *Hippocrate, L'ancienne médecine, Etudes et Commentaires* 4, Paris 1948, xxxi f.

⁴ *Studien zu περὶ ἀρχαίας ἰητρικῆς*, Diss. Zürich 1939.

⁵ "Die pseudo-hippokratische Schrift περὶ ἀρχαίας ἰητρικῆς", in Sudhoff's *Archiv f. Gesch. d. Medizin* 23, 1930, 299ff.

⁶ *Hippocratic Medicine, its Spirit and Method*, New York 1941, 83.

⁷ *op. cit.*, 45.

⁸ *op. cit.*, 48.

⁹ *op. cit.*, xxxii.

Breaths, and the doctors who are criticised in the treatise *On the Nature of Man*. More recently, H. Diller¹ has proposed a radically different interpretation of the date and significance of *VM*, suggesting that the author is directly influenced by Plato, whom indeed he is opposing. 'Wir gewinnen in seiner Schrift,' as Diller puts it,² 'ein Zeugnis zeitgenössischer Auseinandersetzung mit platonischer Lehre.' Since Diller wrote, the problem has been further discussed by J. H. Kühn,³ who rejects Diller's view of the date of *VM* and considers that the treatise *On Breaths* is representative of the type of work which the author is attacking. In the present article I shall re-examine the problem of the relation of *VM* to extant medical works and to known medical writers of the fifth and fourth centuries B.C. The main question to be discussed is the identity of the theorists whose ὑποθέσεις are attacked in *VM* chh. 1 and 13 ff. In those chapters the author condemns what he calls a 'new' or 'new-fangled' method in medicine (καινόν ch 13, CMG 1,1 44,8, cf καινῆς ch 1, 36,16) and he illustrates this method by referring to certain doctrines which he specifies quite clearly. How far is it possible to determine whom precisely the author of *VM* has in mind in those chapters, and whether, in particular, the method of hypothesis which he attacks is a pre- or post-Platonic development?

The opening words of *VM* describe the theories which the writer opposes quite specifically: 'Οκόσοι μὲν ἐπεχείρησαν περὶ ἰητρικῆς λέγειν ἢ γράφειν ὑπόθεσιν αὐτοὶ αὐτοῖς ὑποθέμενοι τῷ λόγῳ θερμὸν ἢ ψυχρὸν ἢ ὑγρὸν ἢ ξηρὸν ἢ ἄλλο τι, ὃ ἂν θέλωσιν, ἐς βραχὺ ἄγοντες τὴν ἀρχὴν τῆς αἰτίας τοῖσιν ἀνθρώποισι νούσων τε καὶ θανάτου καὶ πᾶσι τὴν αὐτὴν ἐν τῇ δύο ὑποθέμενοι... (CMG 1,1 36,2ff). In ch 13 the writer returns to the attack with the words: ἐπὶ δὲ τῶν τὸν καινὸν τρόπον τὴν τέχνην ζητεῦντων ἐξ ὑποθέσεως τὸν λόγον ἐπανελθεῖν βούλομαι (44,8f).⁴ The use of the terms ὑπόθεσις and ὑποτίθεσθαι in these and other passages is striking. The noun occurs six, and the verb three, times in *VM* and the writer clearly assumes that his readers are familiar with these terms and with their use in the context of medical theories in particular. Yet as

¹ "Hippokratische Medizin und attische Philosophie", *Hermes* 80, 1952, 385ff.

² *op. cit.*, 409, cf 393 'Die Vorstellungen, die der Verfasser von Techne, Methode, Hypothese hat, und darüber hinaus sein methodisches Bewusstsein als solches sind ohne Platon nicht denkbar.'

³ *System- und Methodenprobleme im Corpus Hippocraticum*, *Hermes Einzelschriften* 11, 1956, 46ff. Kühn's work was largely completed by 1949 (see his Preface), but he has added an independent chapter (Pt 1 ch 5) in which he discusses Diller's views on the date of *VM*.

⁴ I retain Kühlewein's τὸν λόγον (with Jones, Festugière, cf Littré's λόγον) in preference to Heiberg's λόγων.

several scholars have noted, the word is very rare indeed in extant literature before Plato. It occurs once, probably, in the treatise *On Breaths*,¹ but otherwise (apart from in *VM*) nowhere before Plato and his contemporaries (e.g. Xenophon, Isocrates). The main meanings of the word may be summarised: (1) a proposal or suggestion (e.g. Xen. *Cyr.* 5,5,13); (2) the subject under discussion (often in Isoc., e.g. 4,63); (3) a thesis, i.e. a proposition to be proved (as in *Flat.* ch 15)²; and lastly (4) an assumption or postulate, i.e. something which is itself not proved, but which is used as a basis for inferences or theories. This last is, of course, the meaning which the word has in a number of important passages in Plato where the method of inquiry by a *ὑπόθεσις* is developed and discussed. Plato's use of the term in this sense is complex, and the interpretation of some of the key passages is disputed.³ But it should be noted that the term *ὑπόθεσις* in the sense 'assumption' probably occurs first in the *Meno* in a passage in which an apparently new method of argument is introduced, and in which the term itself is carefully explained. At *Meno* 86e3ff Socrates uses the expression ἐξ ὑποθέσεως ... σκοπεῖσθαι and then immediately explains this, for Meno's benefit, giving an example from geometry: λέγω δὲ τὸ ἐξ ὑποθέσεως ὥδε, ὥσπερ οἱ γεωμέτραι πολλάκις σκοποῦνται...

In *VM* itself *ὑπόθεσις* means neither a proposal, nor a subject under discussion, nor yet a thesis to be proved. The writer gives as examples of *ὑποθέσεις* 'hot or cold or wet or dry or whatever they like,' which certain theorists held to be the causes of diseases and death (ch I, 36,3 ff, cf ch 13, 44,8 ff, ch 15, 46,18 ff). He complains that medicine has no

¹ Reading *ὑπόθεσις* rather than Heiberg's *ὑπόσχεσις* in ch 15, CMG I, 1 101, 21 (see Festugière, op. cit., n 1 p 26).

² The *ὑπόθεσις* here is not an *assumption* from which deductions will be drawn, but a *thesis* which the writer aims to establish. In ch 5 (94,5f) he says that he will show that all diseases are the 'offspring' of air, and in ch 15 he concludes his discussion by saying ἡγαχρον δὲ τὸν λόγον ἐπὶ τὰ γνώριμα τῶν ἀρρωστημάτων, ἐν οἷς ἀληθὴς ἡ ὑπόθεσις ἐφάνη (101,20f).

³ On the whole subject of Plato's use of *ὑπόθεσις* in *Meno*, *Phaedo*, *Republic* and *Parmenides*, see especially R. Robinson, *Plato's Earlier Dialectic*, 2nd ed., Oxford 1953, chh 7-10 and ch 12. On *ὑπόθεσις* in the *Phaedo*, in particular, compare Hackforth (*Phaedo*, Cambridge 1955, 133 and 136ff) who describes the method of hypothesis as 'the establishment of some proposition through deduction from a hypothesis, or proposition assumed to be true', with R. S. Bluck (*Phaedo*, London 1955, Appendix 6, 160ff) who contends that 'hypotheses' are not propositions, but 'provisional notions' of Forms (see also Bluck's article, "ὑπόθεσις in the *Phaedo* and Platonic Dialectic", *Phronesis* 2, 1957, 21ff, and his edition of the *Meno*, Cambridge 1961, 75ff and Appendix, and cf H.-P. Stahl, "Ansätze zur Satzlogik bei Platon", *Hermes* 88, 1960, 409ff).

need for a *ὑπόθεσις* like other subjects ὥσπερ τὰ ἀφανέα τε καὶ ἀπορεόμενα, περὶ ὧν ἀνάγκη, ἥν τις ἐπιχειρῇ τι λέγειν, ὑποθέσει χρῆσθαι, οἷον περὶ τῶν μετεώρων ἢ τῶν ὑπὸ γῆν (ch 1, 36, 16 ff). There can be no doubt that the *ὑποθέσεις* referred to in *VM* are postulates or assumptions used as the basis of philosophical and medical theories. It is generally agreed that the term has a similar meaning in *VM* and in some of the passages in Plato in which ‘hypothetical method’ is discussed,¹ and yet it is difficult, or rather, as I believe, impossible, to parallel this usage in extant fifth century literature.² Diller argued, then, that in his use of the term the author of *VM* is directly influenced by Plato. But even if we were to accept this suggestion, it would not solve all our difficulties. Diller maintains that the author of *VM* sometimes has *Plato himself* in mind when he criticises the use of *ὑποθέσεις*, but this seems very unlikely. *VM* specifically attacks the use of hot, cold, wet and dry, and these were, of course, never adopted as postulates by Plato himself. We should have to assume, then, that Plato’s use of *ὑπόθεσις* influenced certain contemporary medical theorists, and that it was *these latter* whom the author of *VM* was attacking in chh 1 and 13 ff.³ *Meno* 86e4 ff suggests quite strongly that *ὑπόθεσις* may have been used before Plato in the sense ‘preliminary assumption’ in the field of geometry.⁴ If this was the case, it seems at least as likely that the term was introduced into medicine

¹ e.g. *Phaedo* 100a ff where what is postulated is the beautiful ‘itself’ (καλὸν αὐτὸ καθ’ αὐτό) and other Forms (100b5f), and *Republic* 510c2ff where *ὑποθέσεις* are illustrated with examples drawn from mathematics ‘the odd and even and the figures and the three sorts of angles and so on.’

² Kühn, *op. cit.*, p 5 n 1, compares the use of *ὑπόθεσις* in *VM* with that in *Flat.* ch 15, CMG I, 1 101, 21, but there is an important difference in the meaning of the term in the two treatises. In *VM* the *ὑποθέσεις* are assumptions on the basis of which deductions were made concerning the causes and cures of diseases. In *Flat.*, on the other hand, the *ὑπόθεσις* is a thesis which the author tries to prove (see above p 110 n 2). In this latter sense a pair of *ὑποθέσεις* would be a pair of propositions to be demonstrated, not a pair of postulates such as ‘the hot’ and ‘the cold’ (cf. *VM* ch 1, 36, 5f ἐν ᾧ δύο ὑποθέμενοι).

³ cf. Kühn, *op. cit.*, 47ff, where he rejects what he calls the modified Diller interpretation.

⁴ In the *Meno*, when the geometrician tackles the problem in hand, that of inscribing a given area as a triangle in a circle, ‘by means of a hypothesis’, he suggests that if certain conditions are fulfilled, then one result follows, but if they are not, then the result is different. Bluck (*Meno*, 92) has, however, suggested that ‘if Socrates, geometrician can say that he wants to make ὥσπερ τινὰ ὑπόθεσιν’ (87a2), ‘the word *ὑπόθεσις* can hardly have been a well-established technical term in mathematics.’ It should also be noted that *ὑποθέσεις* are again illustrated with examples taken from ‘geometry and calculation’ in the *Republic* 510c2ff, but that here the *ὑποθέσεις* are quite different, ‘the odd and even and the figures and the three sorts of angles’, i.e. certain fundamental notions of mathematics.

from geometry, as that its introduction was a reflection of the influence of Plato's own hypothetical method. And of course a third alternative is also possible, namely that the use of the term in medicine developed quite independently.¹ The author of *VM* uses ὑπόθεσις freely and without explanation in the sense 'postulate' or 'assumption'. Yet we have no good independent evidence by which to date the introduction of the term in this sense into medicine.

We must now examine more closely the *content* of the theories which *VM* criticises so strongly. It has, I think, generally been assumed that *VM* refers to a wide range of medical theories in his attacks on the use of ὑποθέσεις. The fact is, however, that the actual ὑποθέσεις which he mentions are always the same, namely hot, cold, wet and dry. These are the examples which are given not only in ch 1 (36,3f) but on each subsequent occasion when ὑποθέσεις are considered. In ch 13 the writer returns to the theories of 'those who conduct their researches in the art according to the new method, by a hypothesis,' and goes on εἰ γὰρ τί ἐστὶν θερμὸν ἢ ψυχρὸν ἢ ξηρὸν ἢ ὑγρὸν τὸ λυμαινόμενον τὸν ἄνθρωπον... (44,9ff). In ch 14 he says that the 'original discoverers' of medicine never thought that dry or wet or hot or cold or any such thing injured a man, or that a man had any need of those things (45,18ff). In ch 15 he mentions a further ἀπορίη which faces those who make use of a ὑπόθεσις, and again hot, cold, dry and wet are the examples he cites: οὐ γὰρ ἐστὶν αὐτοῖσιν, οἶμαι, ἐξευρημένον αὐτό τι ἐφ' ἑωυτοῦ θερμὸν ἢ ψυχρὸν ἢ ξηρὸν ἢ ὑγρὸν μηδενὶ ἄλλῳ εἶδει κοινωνέον (46,20ff).² He goes on to explain that one sort of hot thing is astringent, another insipid, another causes flatulence, and so on (46,27ff). In ch 16 (47,12ff) he asserts that cold and heat are the least potent of all the 'powers' in the body, and he devotes four whole chapters to dealing with this particular pair of opposites. Although the philosopher Empedocles is mentioned, in another connection, in ch 20, 51,10,³ the writer never refers to earth,

¹ Festugière, *op. cit.*, n 1 p 25, notes that the verb ὑποτίθεσθαι is already used in the sense 'suggest' (to someone, to say or do something) in Homer. Yet for my part, I can find no clear instance of the verb with the meaning *assume* before Plato, other than in *VM* itself.

² On the use of the terms εἶδος, αὐτὸ ἐφ' ἑωυτοῦ and κοινωνεῖν in this passage (which led Taylor, *Varia Socratica*, Oxford 1911, 215, to conclude that 'the technical phrases of the *Phaedo* are not Plato's invention but belong to fifth century science') I have nothing to add to the full discussion in Festugière, *op. cit.*, n 54, pp. 47-53.

³ Festugière, *op. cit.*, n. 69 pp. 58ff, uses this reference to Empedocles as his chief evidence for the date of *VM*, which he puts between 440 and 420 B.C. on the grounds that this was when Empedocles' philosophy was particularly influential. But though this

air, fire or water as examples of ὑποθέσεις, nor does he refer to blood, bile, black bile or phlegm as such.¹ As for such other things as bitter and sweet, astringent and insipid, salt, acid and so on, these are not rejected as unwarranted ὑποθέσεις at all: the writer acknowledges, and indeed emphasises, their importance as bodily constituents, and as possible causes of disease (ch 14,45,26ff).² Although he adds the words ἡ ἄλλο τι, ὃ ἂν θέλωσιν to the examples 'hot or cold or wet or dry' in ch 1 (36,3f, and cf ἄλλο τούτων in ch 14, 45,19), the evidence definitely suggests that it was these four opposites (and especially hot and cold) that were the particular objects of his attack. We may, perhaps, be even more precise. To judge from the remark ἐν ᾗ δύο ὑποθέμενοι in ch 1 (36,5f) the *main* theorists whom the author of *VM* had in mind were pathologists who held either one, or a pair, of these opposites to be the sole cause of diseases.

Whatever other opponents the author of *VM* may have wished to criticise, he concentrates his attack on theorists who had postulated the hot, the cold, the wet and the dry as the cause of diseases, and particularly on those who had referred to just one, or a pair, of these opposites. Bearing in mind that *VM* criticises certain quite specific theories in chh1 and 13ff, and that this affords us the best means of judging his main or immediate opponents, we may now consider the evidence in the Hippocratic Corpus and elsewhere to see how closely the criticisms of *VM* relate to any extant medical works or known medical theorists.

At first sight it seems possible to suggest that one of the thinkers whom *VM* was attacking was Alcmaeon, since according to Aetius V

reference fixes a *terminus post quem* for the treatise, it establishes no *terminus ante quem* for it. It does not even necessarily imply that Empedocles was an important influence at the time, for his theories are not referred to. The point at issue in *VM* ch 20 is whether a doctor needs to know what a man's constituent elements are in order to be able to cure patients, and in Jaeger's view (*Paideia*, Oxford 1939-45, III p. 19 and n. 40) the mention of Empedocles serves merely to illustrate the meaning of the word φιλοσοφία in 51,10 where it is already used in its restricted sense to refer to natural philosophy.

¹ Yet we know from *Nat. Hom.* ch 2 (L VI 34,8ff) that certain medical theorists, presumably of the late fifth century, asserted that man is composed of one of these humours, e.g. blood or bile, alone. cf the theory ascribed to a certain Thrasymachus of Sardis in Anon. Lond. XI 42ff, that diseases arise from the blood.

² ἐν γὰρ ἐν ἀνθρώπῳ καὶ ἀλμυρὸν καὶ πικρὸν καὶ γλυκὺ καὶ ὀξύ καὶ στρυγνὸν καὶ πλαδαρὸν καὶ ἄλλα μυρία παντοίας δυνάμειας ἔχοντα πλῆθος τε καὶ ἰσχύον. ταῦτα μὲν μεμειγμένα καὶ κεκρημένα ἀλλήλοισιν οὔτε φανερά ἐστιν οὔτε λυπέει τὸν ἄνθρωπον, ὅταν δέ τι τούτων ἀποκριθῇ καὶ αὐτὸ ἐφ' ἑωυτοῦ γένηται, τότε καὶ φανερόν ἐστι καὶ λυπέει τὸν ἄνθρωπον.

30,1, DK 24 B 4, at least, Alcmaeon held that τῆς μὲν ὑγείας εἶναι συνεκτικὴν τὴν ἰσονομίαν τῶν δυνάμεων, ὑγροῦ, ξηροῦ, ψυχροῦ, θερμοῦ, πικροῦ, γλυκέος καὶ τῶν λοιπῶν, τὴν δ' ἐν αὐτοῖς μοναρχίαν νόσου ποιητικήν. Though the mention of wet, dry, cold and hot suggests the type of theory that *VM* particularly attacks, there are two major objections to the view that the author of *VM* had Alcmaeon's own theory specifically in mind. (1) Alcmaeon can hardly be said to have 'narrowed down the causal principle of diseases' (*VM* ch 1, 36,4f). According to the same source, Aetius, Alcmaeon attributed diseases to several other causes besides the μοναρχία of one or other of the 'powers' in the body, viz to the excess or deficiency of a diet, and to certain external causes, e.g. blows. (2) Again, if Alcmaeon used 'postulates' at all, it is quite clear that he referred to many more than 'one or two.' He believed in the importance of a great many 'powers' besides hot, cold, wet and dry: this is clear not only from the words of Aetius, who mentions 'bitter, sweet and the rest,' but also from the evidence of Aristotle, who implies that, unlike those Pythagoreans who adopted the συστοιχία, Alcmaeon held an indefinite number of pairs of opposites as principles (*Metaph.* A 5 986a 31ff, DK 24 A 3). In some respects, indeed, Alcmaeon's theory corresponds to that which the author of *VM* himself puts forward in ch 14, 45,26ff,¹ although Alcmaeon apparently attributed greater importance to hot, cold, wet and dry than the author of *VM* was prepared to concede.

There are, of course, several Hippocratic treatises which state theories concerning the elementary constituents of man. *On Breaths* puts it that air, which is the most powerful thing in the world as a whole (ch 3, CMG I, 1 92,21f) is also the sole cause of diseases (ch 4, 93,18ff, cf ch 2, 92,13ff). *On Regimen I* states that man is composed of fire and water (ch 3, L VI 472,12ff), and these two substances play an important part in the writer's theory of health and disease (e.g. ch 32, 506,14ff). Setting aside for the moment the difficult problem of the date of these treatises, we might suppose that either of them was the particular object of the criticisms of *VM*, since they both base theories of disease on a postulate or postulates. Yet on no occasion does the author of *VM* refer to air, or to fire or water, as examples of ὑποθέσεις. *On Breaths* and *On Regimen I* undoubtedly 'narrow down the causal principle of diseases',

¹ Both Alcmaeon and the author of *VM* share the admittedly very common Greek medical theory that health depends on a balance of certain opposed factors in the body, and they agree on the importance of the bitter and the sweet (see *VM* ch 14, 45,26ff, quoted above p 113 n 2).

in the words of *VM* ch 1, 36,4f; yet the author of *VM* never refers to the use of such postulates as air, fire or water, which is strange if he had either of these works *specifically* in mind.¹ If the author of *VM* knew either or both of these works (though this must be considered rather doubtful),² it is possible that his general attack on the use of unwarranted assumptions in medicine refers to them, among others. But it seems very difficult to hold that either of them was the *immediate* object of his criticisms in chh 1 and 13 ff, where the typical ὑποθέσεις mentioned are the hot and the cold, the wet and the dry themselves.

Are these particular opposites used in any other Hippocratic treatise in a way which corresponds more precisely to the theory attacked in *VM*? Two of the works which Jones³ cited as belonging to the general group which *VM* was criticising, propose quite complex pathological theories in which many other factors besides hot, cold, wet and dry are taken into account. In *On Affections* ch 1 (L VI 208,7 ff) diseases are attributed to bile and phlegm when they become too dry or too wet or too hot or too cold in the body, but these changes are brought about by a variety of causes among which the writer mentions food and drink, exercise, wounds etc, as well as 'the hot and the cold' themselves. In *On Diseases I* ch 2 (L VI 142, 13 ff) excessive heat, cold, dryness and moisture are mentioned among the 'external' causes of disease, but the writer makes it clear that diseases are also caused by other factors, both external (e.g. exercise and wounds) and internal (bile and phlegm). These Hippocratic writers are among the many who ascribe a certain importance to hot, cold, wet and dry in their pathological theories, but they are hardly likely to be the theorists who are referred to in *VM* ch 1 as reducing the causes of diseases and death to these opposites alone.

Three other treatises ascribe a more fundamental role to hot, cold, wet and dry, or to one of these opposites. In *On the Nature of Man* ch 3

¹ The four primary opposites are, however, brought into association with the two elementary substances in *Vict. I*: fire is hot and dry, but has some moisture, and water is cold and wet, but has some dryness (ch 4, L VI 474,8 ff).

² *Flat.* was probably written near the end of the fifth century at the earliest (there seems to be an echo of Eur. *Troades* 884 ff in ch 3, CMG I,1 93,16, which would date that passage after 415 B.C.). As regards *Vict. I*, I should agree with Jaeger (*Paideia*, III 40) that 'the language of the book is more reminiscent of the middle of the fourth century than of its beginning or of any earlier period.' On the date of *VM* itself, see below p 125. Unless we hold, with Diller, that it shows Platonic influence (and this I believe to be unnecessary), it is unlikely that the author knew *Vict. I*, and not even very probable that he knew *Flat.*

³ *op. cit.*, 48.

(L VI 36,17 ff) the writer¹ says that generation cannot take place unless hot and cold, wet and dry are evenly balanced; he goes on to say that on death, the wet, the dry, the hot and the cold in a man's body return to their respective counterparts in the world at large. In subsequent chapters, however, the body is said to be composed of the four humours, blood, phlegm and the two sorts of bile, yellow and black: indeed in ch 5, 40,15 ff, the author goes to some lengths to prove that these are the constituents of the body. Moreover in ch 4, 38,19 ff, we are told that it is these *humours* which cause health and disease. Each humour is thought of as either hot or cold, and either wet or dry (e.g. ch 7, 46,9 ff), but it is clear that the pathological theory in this treatise is rather more complex than that which is attacked in *VM* ch 1. The doctrine of *On Diseases IV*² seems to come quite close to the type of theory criticised in *VM*, for all diseases except those caused by physical violence are ascribed to the four forms of 'the wet' (ch 32, L VII 542,6 ff). Yet these four forms of 'the wet' (ὕγρον, elsewhere the writer uses the term ἰκμάς), turn out to be phlegm, blood, bile and water (ὕδρωψ) which have distinct origins and effects in the body, as the writer shows at length in chh 35 ff (548,11 ff). Here too, then, the theory of disease is based on humours, rather than on the opposites themselves. Finally, there is the treatise *On Fleashes* which puts forward a four-element theory.³ 'What we call the hot' (which 'the ancients seem to have called αἰθήρ') is the most important element; the others are earth, air

¹ *Nat. Hom.* is a composite work, but parts of it may be ascribed, with some probability, to Polybus, the son-in-law of Hippocrates. The account of the veins in ch 11 (L VI 58,1-60,9) is quoted at length by Aristotle at *HA* 512b 12ff and assigned to Polybus. The account of Polybus in Anon. Lond. XIX 1ff is very corrupt, but Diels' reconstruction, giving many echoes of *Nat. Hom.*, especially chh 3 and 4, must be considered likely, and on these grounds it is possible to attribute the first part of the treatise, chh 1-8, to Polybus as well.

² The same theory is expressed very briefly in *Genit.* ch 3, L VII 474,7ff. This treatise is certainly closely connected with *Morb. IV* and Littré suggested, with some plausibility, that the two, together with *Nat. Puer.*, form a single continuous work.

³ In the introductory ch 1 of *Carn.*, L VIII 585,3, we find the verb ὑποθέσθαι used with ἀρχή, but the sense is not 'postulate a principle' so much as 'suggest a beginning' (for the idea, cf *de Arte* ch 4, CMG I,1 11,5f and Diogenes of Apollonia *Fr* 1). ἀρχή should not, in any case, be taken to refer to θερμόν and the other elements mentioned in ch 2, since the writer expressly distinguishes ch 2, which, he claims, contains his own original ideas (νῦν δὲ ἀποφαίνομαι αὐτὸς ἐμῶν γνῶμας 584,8) from ch 1, where he presents 'common opinions' – κοινὰ γνῶμαι.

and 'that which is nearest the earth' (ch 2, L VIII 584,10ff).¹ The aim of this treatise is to describe the formation of the different parts of the body, in his account of which the writer refers repeatedly to the four main opposites, hot, cold, wet and dry, as well as to such other factors as sweet and bitter, the fatty (λίπαρόν) and the glutinous (κολλώδεις). Unfortunately, we know very little about the author's theory of disease (though in ch 19, 612,10ff, he makes use of a doctrine of critical days). It is possible, or even likely, that he attributed some diseases to the same elements and opposites that he used in his account of the formation of the parts of the body.² But even if we could assume that *On Fleashes* was definitely written before *VM* (and this is by no means certain³), we should hesitate before concluding that the author of *VM* was attacking this treatise especially in those chapters where he criticises those who based their theories of disease on a ὑπόθεσις.⁴

Among the many different theories of disease which are found in the Hippocratic Corpus, there are several to which the author of *VM*

¹ As in *Vict. I*, so too in *Carn.*, certain opposites are associated with the elements, though the schema in *Carn.* is less neat: earth is 'cold and dry and full of movement, and there is much hot in it'; air is 'hot and moist'; and 'that which is nearest the earth' is 'moistest and thickest' (ch 2, 585, 13ff).

² A passage in ch 16, 604,16ff shows that this was at least sometimes the case: there the writer refers to catarrhs which come from the brain, and calls these a τροπή τῷ θερμῷ.

³ Like most other Hippocratic treatises, *Carn.* cannot be dated with any degree of precision, but K. Deichgräber (*Hippokrates, Über Entstehung und Aufbau des menschlichen Körpers*, Leipzig 1935, p. 27 n 4) concluded that it belongs to the end of the fifth century. Littré put the treatise much later (not before Aristotle), but it should be noted that his main argument for doing so is invalid. He argued that Aristotle was the first to hold that the heart is the source of the veins (though he observed that the generalisation, at *HA* 513a 10ff, that *all* previous writers regarded the head as the starting-point of the veins, is incompatible with the account which Aristotle himself gave of the theory of Diogenes of Apollonia), and that treatises such as *Carn.* that contain this view must be posterior to the work of Aristotle. Yet quite apart from the doubtful assumption that Aristotle's knowledge of the medical theories of his predecessors was exhaustive, it is certain that he was not the first to suggest that the heart is the origin of the veins since this view occurs quite unmistakably in the *Timaeus* of Plato (70ab).

⁴ The treatise *On Sevens* (ed. W. Roscher, Paderborn 1913) should also be mentioned, though the date of this work, too, is disputed. The hot plays an important part as the cause of at least one type of disease (fevers, chh 19f, 24ff; at ch 53 the author promises, but does not give, an account of other kinds of disease). However if chh 1-11 should be considered as part of the same work (though this has sometimes been doubted), both the theory of the components of the body and the general pathological doctrine expressed there are complex and refer to other factors besides the hot. There are seven constituents in the body (among them, the hot and the cold) and pain is said to be caused by the disharmony of these as a whole (ch 10, cf ch 15).

would have objected, either because they were based on a postulate, or because they laid too great an emphasis on hot, cold, wet and dry. The criticisms of *VM* are certainly relevant, in part, to a number of Hippocratic writers. But to judge from the particular form which those criticisms take, it seems unlikely that any of the other extant treatises of the Hippocratic Corpus is the *immediate* and *specific* object of his attack. It remains to consider whether the account of early Greek medical theorists in Anonymus Londinensis helps to define the opponents of *VM* more precisely.

In Anon. Lond. IV 26ff, medical theorists are divided into two groups, those who held that diseases arise from what the writer calls the 'residues,' *περισσώματα*, of nourishment, and those who held that they come from the elements in the body (though in the account which follows, some theorists seem to be misplaced).¹ Among the latter, three theorists are named who held that the primary constituents of the body are the hot and the cold (or the hot alone). These are Philolaus, Polybus and Petron of Aegina.² The account of Polybus is, unfortunately, particularly corrupt, and though Diels' reconstruction of the text, based on *On the Nature of Man* chh 1-8, is probable enough, the passage can tell us little more than *On the Nature of Man* itself, whose doctrines have already been discussed. The theory ascribed to Petron of Aegina (XX 1ff) is that our bodies are composed of a pair of elements, the cold (with which the wet is *ἀντίστοιχον*) and the hot (with which the dry is *ἀντίστοιχον*), and he apparently attributed diseases both to a disproportion between these elements, and to the effects of the residues of nourishment. But the most important evidence concerns Philolaus himself. At XVIII 8ff we are told that 'Philolaus of Croton says that our bodies are composed of the hot,' and there then follows an account of the argument which led Philolaus to infer that our bodies 'do not share

¹ One of the theories which is included, somewhat strangely, in the first section, is worth noting especially. This is the doctrine attributed to 'Hippon of Croton' (XI 22ff, the name is uncertain, see Diels' note ad loc.), that 'the moisture' in our bodies causes diseases when it changes through excessive heat or cold. It is clear from remarks at XI 32 and 41f, however, that, to the writer's knowledge, at least, Hippon had no detailed theory of disease.

² The doctrines attributed to Philistion and to Menecrates also make use of opposites in connection with a theory of the elements in the body. For Philistion (XX 25ff) our bodies consist of four elements, fire, air, water and earth, and each of these has its own 'power', hot, cold, wet and dry. Menecrates (XIX 18ff) held that we are composed of four humours, two of which are hot (blood and bile) and two cold (breath and phlegm). cf the type of theory which we find in *Vict. I* (p 115 n 1, above) and in *Carn.* (p 117 n 1, above).

in the cold.' It may be noted that though initially, in the womb, the living creature has no share in the cold, immediately on birth it inhales the air, which is cold, and thereafter 'discharges it again, just like a debt' (XVIII 23 f). Some of the details of this theory are reminiscent of the cosmological doctrine attributed to the Pythagoreans by Aristotle, which began when 'the one' (or the heaven) 'draws in' or 'inhales' 'breath and the void' from 'the unlimited',¹ and there seems little reason to doubt the accuracy of the report in Anon. Lond. which attributes an analogous biological theory to the Pythagorean Philolaus.

Here, then, is one thinker who apparently held that we consist originally of a single substance, the hot, who might seem just the type of theorist who is attacked in *VM* ch 1 for 'postulating hot or cold or wet or dry or whatever they like.' But what of Philolaus' theory of disease? We are told at Anon. Lond. XVIII 30 ff that he held that 'diseases arise through bile and blood and phlegm' (cf also 48 ff where 'excesses and defects of heat and nourishment and cold and suchlike' are mentioned as συνεργά 'contributory causes'), and this report seems incompatible with the suggestion that Philolaus himself was one of those attacked in *VM* for narrowing down the causal principle of diseases and of death to one or two opposites. However the statement that bile, blood and phlegm are the cause (ἀρχή) of diseases (XVIII 31 f, cf 47 f) must be interpreted in the light of further observations which are made in Anon. Lond. concerning Philolaus' theory of these humours. What we have in Anon. Lond. XVIII 32 ff is not an account of how diseases come from the three humours mentioned, so much as certain rather sketchy information about how these humours themselves arise in the body, and what causes the changes to which they are subject. We are told at 37 f that Philolaus held that bile, for example, is an ἰχώρ of the flesh (and certain changes in the blood are also due to the compression and dispersion of the flesh, 32 ff), and we hear more about Philolaus' theory of bile in the account of Petron of Aegina. There it is reported that Petron thought that bile is a product, not a cause, of diseases, and the passage continues (XX 21 ff): καὶ σχεδὸν [οὗτος ὡς] / ὁ Φιλόλαος οἶεταί μὴ (εἶναι) ἐν ἡμῖν χολή[ν ἢ] / ἀ[χρ]εῖαν. Although this passage is corrupt the gist of the report is fairly clear: both Petron and Philoclaus held that bile is a useless residue in the body. Again Philolaus' theory of the origin of phlegm is very briefly reported at XVIII 36 f: τὸ δὲ φλέγμα συνίστασθαι ἀπὸ τῶν ὄμ / βρωῶν φ(ησὶν). It seems, then, that though Philo-

¹ *Ph.* 213b 22 ff and Stob. *Ecl.* I 18, 1c (quoting Aristotle's lost work on the Pythagoreans), and see also Simplicius, in *Ph.* 651, 26 ff.

laos may have derived certain diseases from bile, blood and phlegm, he certainly did not consider these humours as elementary constituents of the body, but rather as the products of certain admittedly very obscure physiological changes. Furthermore at XVIII 41 ff we are told that while the majority of thinkers held that phlegm is *cold*, Philolaus asserted that it is essentially *hot*: τό τ' αὖ φλέγμα / ...θερμὸν τῇ φύσει ὑπ[ο]τί- / θεται· ἀπὸ γ(ὰρ) τοῦ φλέγειν φλέγμα εἰρῆσθ(αι). Now it was a generally accepted opinion that blood and bile are hot.¹ It could well be that this was also Philolaus' view, but that no reference is made to this in Anon. Lond. because the writer is simply concerned, at this point, to draw attention to what he calls the 'paradoxical' theories of Philolaus (XVIII 38 ff). It is possible to conjecture, then, that he believed that each of the three humours, bile, blood and phlegm, and not just phlegm alone, is by nature hot, and if this was the case, 'the hot' may have held almost as important a place in Philolaus' pathological theory as in his embryological doctrine. We know that he held that 'the hot' is the sole substance of which our bodies are originally composed: it may also have been the case that he reduced the principal causes of diseases to different manifestations of 'the hot.' This conjecture cannot, however, be confirmed, since the evidence for Philolaus' theory of the origin of bile, blood and phlegm is defective at what is, for our purposes, the most important point. We are told that bile and phlegm come from flesh and water respectively, but we do not know how these and all the other substances in the body arose, whether they were derived from the hot alone, or from the hot in conjunction with the cold which is inhaled after birth, or whether some other account of their origin was given. If Philolaus held that diseases were caused by different forms of 'the hot,' then his pathological theory came close to the type which is specifically mentioned and condemned in *VM*, and the case for considering that Philolaus was among those against whom that attack is particularly directed, would be very strong. Yet our evidence certainly suggests that the immediate causes of diseases are three distinct humours, and not 'the hot' *per se*, and in this respect, Philolaus' pathological doctrine seems to have been more complex than those which are the particular object of the criticisms of *VM*.

The evidence in Anon. Lond. does not permit us to identify with certainty those who held the specific doctrines referred to in *VM* chh 1 and 13 ff. Just as there are several Hippocratic treatises which emphasise the importance of hot, cold, wet and dry either as elements, i.e. primary

¹ e.g. *Nat. Hom.* ch 7, L VI 46, 22ff and 48, 7ff and *Morb. I* ch 24, L VI 188, 19ff.

component substances (as in *Nat. Hom.*), or as causes of disease (e.g. *Morb. I*), so there are several theorists who are reported in Anon. Lond. to have held similar views. Yet the author of *VM* refers to pathologists who apparently reduced the causes of diseases to such opposites alone, and this extreme form of the doctrine is found neither in the Hippocratic Corpus nor in the account of medical theories in Anon. Lond. But if we are unable to name the particular theorists who are the immediate object of the attack in *VM* ch 1, it is nevertheless possible to make certain suggestions concerning the origin of the type of doctrine criticised there. Of those who are reported in Anon. Lond. to have stressed the role of opposites as elements in the body, the first and most important is Philolaus, who maintained that we are composed originally of the hot alone. It is, then, worth investigating further the possibility that it may be Philolaus' influence on medical theory, if not Philolaus himself, that *VM* is attacking especially in chh 1 and 13 ff. Two features of Philolaus' work are worth considering in this context, his interest in cosmology, and his interest in geometry.

The author of *VM* (writing, as we know, after Empedocles) attacks those who confuse medicine with philosophy both in ch 20 and, indirectly, in ch 1. No one would deny that there are many writers of the fifth or early fourth century who combined an interest in medicine with an interest in cosmology. But the criticisms of *VM* seem particularly relevant to Philolaus whose medical and cosmological speculations appear to have been closely interrelated. True, some have seen Empedocles as not only an eminent cosmologist, but the founder of a medical school,¹ but while his theory of pores was certainly a major influence on subsequent physiological doctrines, it is, to my mind, very doubtful whether he put forward any detailed theories of disease.² Again, Alcmaeon's medical, physiological and psychological theories are well known, but the evidence for his interest in cosmological problems is limited: apart from such vague general pronouncements as that δύο τὰ πολλὰ τῶν ἀνθρώπων (quoted by Aristotle at *Metaph. A* 5 986a 31) only a few astronomi-

¹ See Burnet, *Early Greek Philosophy*, 4th ed. London 1948, 200f, who based this judgement on Galen, *Meth. med.* I 1 (DK 31 A 3): οἱ ἐκ τῆς Ἰταλίας ἱατροί, Φιλιστίων τε καὶ Ἐμπεδοκλῆς καὶ Πυθαγόρας καὶ οἱ τούτων ἑταῖροι.

² In *Fr* 112, 10ff Empedocles refers to those who sought to hear from him the word of healing for all manner of diseases. But the fact that this passage comes in the *Purifications*, and in a fragment in which he also claims to be a seer, and, indeed, an 'immortal god', might suggest that Empedocles' approach to medical problems was mystical rather than empirical (Burnet, *op. cit.*, 201f, himself suggested that a 'characteristic of the medicine taught by the followers of Empedocles is that they still clung to ideas of a magical nature'.)

cal doctrines are attributed to him, and none of these seems to have been original.¹ Philolaus, however (who came, of course, from the same city as Alcmaeon), seems to have been responsible for important contributions in both medicine and cosmology. As usual when dealing with the Pythagoreans, Aristotle describes the doctrines of the Central Fire and the Counter-Earth without attributing them to any specific thinker (*Cael.* 293a 21 ff), but there seems no good reason to doubt Aetius² when he ascribes these theories to Philolaus, and elsewhere³ he reports Philolaus' doctrines of the sun and moon. The likelihood is, surely, that Philolaus himself originated some, if not all, of the theories which are associated with his name. But we may remember that in *VM* ch 1 (36,15 ff) the writer refers ironically to the use of a *ὑπόθεσις* in such fields as τὰ ἀφανέα τε καὶ ἀπορεόμενα, περὶ ὧν ἀνάγκη, ἢν τις ἐπιχειρῇ τι λέγειν, ὑποθέσει χρῆσθαι, οἷον περὶ τῶν μετεώρων ἢ τῶν ὑπὸ γῆν, where, he says, it would not be evident either to the speaker himself, or to his audience, whether his statements were true or not. He rejects the study of 'things in heaven and things under the earth' altogether, but his *irony*, in *conceding* that this is the proper place for the use of a *ὑπόθεσις*, would (I suggest) have particular point if it were directed against such a writer as Philolaus, for (1) Philolaus appears to have put forward theories based on what must have seemed quite arbitrary assumptions in both astronomy and biology, and (2) in both these fields 'the hot', in particular, probably figured in an important role, in astronomy as the Central Fire in the Universe, and in biology as the primary substance of which our bodies are composed.

Then, like several Pythagoreans, Philolaus is reported to have laid great stress on the study of geometry.⁴ As I have already remarked, the use of the term *ὑπόθεσις* in *VM* is unparalleled in extant fifth century literature, and any attempt to trace its development must, then, be highly conjectural. However one possibility, which is suggested by *Meno* 86e4ff, is that the term may have been used in the sense 'assumption' first in the field of geometry (other examples of its use in mathe-

¹ The evidence is collected in DK 24 A 4 (Aet. II 16,3; 22,4; and 29,3).

² Aet. II 7,7 and III 11,3 (DK 44 A 16 and 17), on which see Kirk and Raven, *The Presocratic Philosophers*, Cambridge 1957, 257ff, and, most recently, Guthrie, *A History of Greek Philosophy*, Vol 1 Cambridge 1962, 282ff.

³ Aet. II 20,12 and 30,1 (DK 44 A 19 and 20).

⁴ Plut. *Quaest. conv.* VIII 2,1 718e (DK 44 A 7a): γεωμετρία κατὰ τὸν Φιλόλαον ἀρχὴ καὶ μητρόπολις ... τῶν ἄλλων (μαθημάτων). cf. especially *Theolog. Arithm.* 82,10 (DK A 13) and Procl. in *Eucl.* 130,8 (DK A 14).

matics are found in Plato *Republic* 510c and in Aristotle, e.g. *EN* 1151a 16f, *Metaph.* 1086a 10f). We have no reliable means of determining which fifth or fourth century mathematician (if any) may have been responsible for introducing the term in this sense.¹ But one admittedly quite inconclusive piece of evidence seems slightly to increase the possibility that Philolaus was among those who used it. In the *Phaedo*, on the first occasion when the word ὑπόθεσις is used (92 d 6) the speaker is not Socrates, but Simmias. Of course Plato's readers knew the term from the *Meno*, where its meaning had been explained and illustrated at some length, and as a general rule we should certainly not try to press the historical accuracy of terms which Plato puts into the mouth of different persons in his dialogues. Yet perhaps it may not be entirely fortuitous that Plato represents Simmias, the pupil of Philolaus,² as being familiar with the term ὑπόθεσις: furthermore Simmias is made to use it in a passage (92 c 11 ff) in which he draws a distinction between an argument based on a 'ὑπόθεσις which is worthy of acceptance' and merely probable arguments, which he says he knows are deceptive 'both in geometry and in every other field.'³ The evidence is far from proving that Philolaus himself did, in fact, use the term ὑπόθεσις in mathematics or in any other context.⁴ But if the term was used before Plato by certain mathematicians or geometricians in particular, the possibility

¹ Festugière, *op. cit.*, n 1 p 26, suggests that the use of the term ὑπόθεσις in geometry before Plato may, perhaps, be confirmed by three texts in Aristotle, Simplicius and Themistius concerning the geometrical ὑπόθεσις of the quadrature of the circle by Antiphon (DK 87 B 13), though he goes on to note that in those passages the word ὑπόθεσις is still not found as a textual quotation of Antiphon himself.

² At *Phaedo* 61 d 6f (cf e 6f) we are told that both Simmias and Cebes had associated with Philolaus. True, in that passage Cebes disclaims definite knowledge of the doctrine that it is wrong to commit suicide, which Socrates suggests he may have learnt from Philolaus, but as Hackforth (*Phaedo*, 35 n 3) has suggested, Cebes' disclaimer, at this point, seems 'no more than a device to allow Socrates to explain the point.'

³ Simmias uses the term ὑπόθεσις with reference to Socrates' argument about reminiscence and learning (δι' ὑποθέσεως ἀξίας ἀποδέξασθαι εἴρηται), which he contrasts with arguments which proceed from probabilities (τοῖς διὰ τῶν εἰλότων ἀποδείξεις ποιουμένοις λόγοις) which he says he recognises as deceptive καὶ ἐν γεωμετρίας καὶ ἐν τοῖς ἄλλοις ἅπαντιν.

⁴ It may also be noted that the second time that ὑπόθεσις is used in the *Phaedo* (94 b 1, cf Simmias' use of the verb at 93 c 10) Socrates applies it to Simmias' suggestion that the soul is an 'attunement' ἁρμονία, a doctrine which has often been taken to have been Philolaus' own, though this is not certain. Macrobius (*S. Scip.* I 14, 19, DK 44 A 23) attributes it to both Philolaus and Pythagoras himself, but Aristotle reports the doctrine without naming its author or adherents (*de An.* 407 b 27 ff) and elsewhere (*de An.* 404 a 16 ff) ascribes other views on the soul to the Pythagoreans as a whole.

that Philolaus was among those who employed it, remote though this may be, seems to be slightly strengthened by the fact that in the *Phaedo* Plato represents a pupil of Philolaus using the term in a passage in which he parades his knowledge of mathematical methods of argument.¹

I may now recapitulate the argument of this article and summarise such conclusions as our evidence appears to warrant. In *VM* chh 1 and 13 ff the writer condemns the use of ὑποθέσεις in medicine, mentioning hot or cold or wet or dry in particular. Several theorists who referred to these opposites either as elements in the body, or as causes of disease, are known to us from the Hippocratic Corpus and Anonymus Londinensis. Yet the writer of *VM* refers to certain pathologists who evidently reduced the causes of diseases and death to such opposites alone, and even though our sources of information about Greek medicine of the fifth and fourth centuries are comparatively extensive, we cannot (as it seems to me) say with certainty who those theorists are. However the writers whose doctrines come closest to those attacked in *VM* are Philolaus, Polybus (the probable author of parts of *On the Nature of Man*) and Petron of Aegina: each of these thinkers based his theory of the elements in the body on those opposites whose importance is so strongly denied in *VM*, although each of them seems to have adopted pathological doctrines which are rather more complex than those that *VM* particularly condemns in ch 1. The criticisms of *VM* seem especially relevant to Philolaus, in particular, and it may tentatively be suggested that one of the main purposes of those criticisms was to oppose Philolaus' influence or the example he set for medical theorists. (1) Philolaus was, so far as we know, the first medical writer to have argued explicitly that the body is originally composed of the hot (which is tempered, as it were, by the cold inhaled by the living creature on birth): in *VM*, chh 16-19 are

¹ It is also just worth mentioning that the verb ὑποτίθεσθαι occurs twice in the sense 'suppose' or 'assume' in the account of Philolaus in Anon. Lond., with reference to his theories that phlegm is hot (XVIII 43f) and that bile, blood and phlegm are the ἀρχαί of diseases (48). The verb in this sense is, of course, common enough in the fourth century, yet the fact that it occurs only once elsewhere in Anon. Lond. (IV 29) suggests that it was not a particular favourite of this writer. To judge from his account at XVIII 8ff the writer of Anon. Lond. had fairly good evidence concerning some, at least, of Philolaus' medical and biological theories, even though the passage in which he reports them is quite brief, and it might be suggested that such a term as ὕδρον used, apparently, to mean 'water' (XVIII 36f) may be a direct quotation from a text which the writer (or his source) took to be a genuine work of Philolaus. It is just possible, then, that the term ὑποτίθεσθαι may also be an echo of Philolaus, though I should grant that this possibility is only a slender one.

dedicated to disproving the idea that the hot and the cold are important 'powers' in the body. (2) In ch 1 the author of *VM* concedes, ironically, that ὑποθέσεις have a place in the study of 'things in heaven and things under the earth' which are beyond empirical verification, while at the same time strenuously maintaining that they should be excluded from the study of medicine, and once again his strictures seem especially relevant to such a writer as Philolaus: little as we know about Philolaus' work, his cosmological and biological speculations seem closely inter-related, and in particular he appears to have ascribed a primary role to 'the hot' in certain theories in both these fields, in cosmology postulating the 'Central Fire' in the universe, and in biology asserting that 'the hot' is the original substance of which the body is composed.

The problem of determining the relation of *VM* to its contemporaries is a difficult one, and our evidence does not permit us to reach positive or precise conclusions. There are a number of striking concepts and usages in this work, notably the recurrent use of the terms ὑποτίθεσθαι and ὑπόθεσις, which are quite exceptional in extant pre-Platonic literature. Yet the suggestion that *VM* is directly influenced by Plato does not solve our problem: it is not Plato's use of ὑποθέσεις that *VM* attacks, but their use by certain medical theorists, and we are still faced with the question as to who these may be. If we cannot name the authors of the particular theories specified in ch 1, the type of doctrine to which *VM* principally objects has close affinities with those adopted by such thinkers as Polybus and Petron, and earlier still by Philolaus. Assuming that the writer is trustworthy when he describes the method of his opponents as 'new' or 'new-fangled' (καινόν), and that this provides our best means of deciding the approximate date of the treatise, it seems more likely that *VM* is a product of the late fifth or of the early fourth century, than that it is as late as, say, the middle dialogues of Plato (though we have, in my opinion, no reliable evidence by which to fix the date precisely within the broad limits to which I refer).¹ We may remember that until the discovery of the text of Anonymus Londinensis, Philolaus' own medical and physiological theories were unknown and unsuspected. To my mind, much of the significance of *VM* lies in the evidence which it affords of certain important, but otherwise largely unknown, developments in scientific method and terminology. As Festugière, Diller and others have noted, the writer already uses φιλοσοφία (51, 10) in the restricted sense 'natural philosophy', ἀναφέρειν

¹ On the reference to Empedocles at 51, 10 which Festugière used as his main evidence to date *VM* between 440 and 420, see above p 112 n 3.

(36,20f and 41,21) in the sense 'refer to' as evidence or as a standard of judgement, and he has a developed notion of medicine as an art, τέχνη.¹ And most valuable of all are the references to, and criticisms of, the use of ὑποθέσεις, for *VM* is the only extant work which indicates that already in the period before Plato (in all probability) medical theorists were familiar with the concept of a postulate, i.e. something which has itself not been proved, but which is assumed as a basis for theories and explanations, and had discussed the legitimacy of making use of such assumptions in different fields of inquiry.²

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¹ On the notion of τέχνη in *VM* see Festugière, *op. cit.*, xv ff and F. Heinimann, "Eine vorplatonische Theorie der τέχνη", *Mus. Helv.* 18, 1961, 105ff.

² A discussion of the relation between *VM* and contemporary philosophy, particularly Empedocles and Anaxagoras, has now been published by J. Longrigg, "Philosophy and Medicine, some early interactions", *Harv. Class. Stud.* 67, 1963, 147ff, especially 152 and 159ff (an article which unfortunately reached me only when this paper was already in proof). It is impossible to deal here with all the points that Longrigg raises, but I should express my disagreement with his thesis that the similarities between *VM* and Anaxagoras are due to the former having influenced the latter (rather than, as is generally thought, the other way round).