

# STUDIES IN ANCIENT MEDICINE

EDITED BY

JOHN SCARBOROUGH

PHILIP J. VAN DER EIJK

ANN HANSON

NANCY SIRAISSI

VOLUME 31



# HIPPOCRATES IN CONTEXT

*Papers read at the*

*XIth International Hippocrates Colloquium*

*University of Newcastle upon Tyne*

*27–31 August 2002*

EDITED BY

PHILIP J. VAN DER EIJK



BRILL  
LEIDEN · BOSTON  
2005

ON ANCIENT MEDICINE ON THE  
NATURE OF HUMAN BEINGS

Mark J. Schiefsky

*Summary*

*This paper discusses the theory of human nature (phusis) presented in On Ancient Medicine. In contrast to thinkers who claimed that medicine must be based on an account of the origin and development of human beings out of elemental constituents, the author of this treatise argues that the true foundation of medicine is knowledge of the humoral constitution of different individuals and of the interactions of the internal organs with fluids and air in the body. Such knowledge is limited in scope and can be attained only by reasoning from everyday experience and experience in medicine.*

In this paper I shall attempt to bring out the distinctive character of the theory of human nature (*phusis*) developed by the author of the Hippocratic treatise *On Ancient Medicine (De vetere medicina, VM)*. Scholars have long recognised that the methodological dispute between the author of this text and his opponents marks a crucial moment in the development of the relationship of medicine and philosophy in ancient Greece. The author's vigorous attack on his opponents, who advocate adopting a philosophical foundation for medical practice, has attracted a great deal of scholarly attention. But perhaps because of the very success of the author's criticism, the originality of his own positive proposals has attracted rather less attention. It has sometimes escaped notice that the author of *VM*, far from renouncing the need for medicine to be based on knowledge of human *phusis*, in fact considers a certain kind of knowledge of human *phusis* to be essential for medical practice and sets out a coherent and highly original method of attaining it. My goal here is to give an account of the character of this theory and to place it in context by contrasting it with a style of theorising about human *phusis* that found numerous representatives in philosophical and medical writers of the fifth and fourth centuries BC. I shall do this by means

of a close examination of chapter 20 of the text, where the issue of what kind of *phusis* theory should be adopted as a foundation for medicine comes into sharp focus.

I begin by offering a translation of chapter 20 and a summary of its contents:<sup>1</sup>

**20 1** Now concerning these matters I think that I have given an adequate exposition of my views. But some doctors (*iētroi*) and sophists (*sophistai*) say that it would be impossible for anyone to know medicine who does not know what the human being is, and that anyone who is going to treat patients correctly must learn this. Their account tends towards philosophy (*philosophiē*), just like Empedocles or others who have written about nature (*phusis*) from the beginning, what the human being is and how it originally came to be and from what things it was compounded. **2** But I say that whatever has been said or written about nature (*phusis*) by a sophist or doctor pertains less to the art of medicine than to writing (*graphikē*), and I think that it is impossible to have clear knowledge about nature (*phusis*) from any source other than medicine. This can be acquired when one has correctly comprehended all of medicine, but until then it is impossible—I mean this science (*historiē*) that consists in knowing what the human being is and by what causes it comes to be and all the rest, with precision. **3** For this I think is what it is necessary for a doctor to know about nature (*phusis*) and to make every effort to know, if he is going to fulfill any of his obligations: what the human being is in relation to foods and drinks and other practices, and what will be the effect of each thing on each individual—not simply that “cheese is harmful food, for it causes trouble to one who eats a lot of it,” but rather what trouble, and why, and which of the things in the human being it is inimical to. **4** For there are many other harmful foods and drinks that affect the human being in a different way. Accordingly, let me take this example: “unmixed wine, drunk in large quantities, affects human beings in a certain way.” All who see this would recognise that this is the power (*dunamis*) of wine and that it alone is responsible; as for the things in the human being that it is especially able to affect in this way, we know what they are. **5** This is the sort of truth that I want to be revealed in other cases as well. For cheese (since I have made use of this example) does not harm all human beings alike: there are some who can eat their fill of it without being harmed at all, and

<sup>1</sup> All translations from *VM* are my own, based on Jouanna’s text (Jouanna 1990). I have also adopted the section divisions from his edition. Translations of other texts are my own unless otherwise indicated. For further elaboration and justification of the argument presented in this paper, see Schiefsky (2005).

indeed it provides a wondrous strength to those whom it benefits; but there are others who have difficulty coping with it. **6** Accordingly the natures (*phusis*) of these people differ, and the difference concerns the very thing in the body that is hostile to cheese and is stirred up and set in motion by it. Those in whom such a humour (*chumos*) happens to be present in greater quantity and to exert more power in the body will naturally suffer more; but if cheese were bad for human nature (*phusis*) in general, it would harm all people. (pp. 145.17–148.2 Jouanna; 1.620–624 L.)

The author attacks thinkers who claim that a doctor needs knowledge of “what the human being is” (ὅ τι ἐστὶν ἄνθρωπος) in order to treat patients correctly. He responds that this procedure “tends towards philosophy” in the manner of Empedocles and others, who attempt to explain how human beings first arose and the constituents from which they were formed. In section 2 the author rejects the claim that this kind of knowledge of human *phusis* is necessary to treat patients correctly: everything these thinkers have said or written “concerning nature” (*peri phusios*) is more appropriate to writing (*graphikē*) than to medicine. But his claim is not that such knowledge is unattainable; on the contrary, he argues that it can be attained, if one masters medicine first. His position is that it is impossible to know anything clearly “about nature” (*peri phusios*) *except* from medicine, where knowledge “about nature” is the knowledge of human origins and development that his opponents claim is a necessary prerequisite to therapy: “I mean this science (*historiē*) that consists in knowing what the human being is and by what causes it comes to be and all the rest, with precision.” Despite the vehemence of the author’s tone in the opening two sections of the chapter, it becomes clear in section 3 that it is not the claim that medicine needs to be based on a theory of human *phusis* that he rejects. Rather, what he objects to is the attempt to make a particular sort of *phusis* theory the foundation of medical practice. In section 3 he emphatically states that the doctor must know “what the human being is in relation to foods and drinks and other practices” and “what will be the effect of each thing on each individual.” The doctor’s knowledge must go beyond crude generalisations such as “cheese is harmful food, for it causes trouble to one who has eaten a lot of it”: he must be able to specify the precise nature of the trouble, its cause, and the thing in the body that it harms. The remainder of the chapter presents two examples that are meant to clarify the nature of the

doctor's knowledge. The first example (section 4) appeals to differences between foods: other foods and drinks, such as wine, can cause harm, but they do not affect human beings in the same way as cheese. The effect of drinking too much wine is different from the effect of eating too much cheese, and the doctor must know what these effects are and how they are caused. The second example (sections 5–6) appeals to the variation between different individuals. Cheese when eaten in large amounts is not harmful to all; while some are harmed by it, it is beneficial to others. These individuals differ in *phusis*, and these differences are understood as differences in their humoral constitution: those in whom the humour hostile to cheese is present in greater quantity or in greater concentration suffer more by eating it. Cheese is not harmful to human nature in general; if it were, it would harm all people in a similar way.

Before turning to a closer examination of the type of *phusis* theory that the author rejects here as irrelevant to medicine, I want to make two preliminary points. First, it is clear from this summary that the issue between the author and his opponents is not whether medicine should be based on a theory of human *phusis*, but rather what sort of theory it should be based on. The author is no sceptic about the possibility of acquiring knowledge of human *phusis*. His point is not that a knowledge of human origins and development is unattainable, only that it is irrelevant to medicine. Indeed he states quite clearly that the knowledge of human origins and development which his opponents purport to have can be acquired, though not by the method they follow. I shall return to this remarkable claim at the end of this paper. For the moment, I want only to stress that the author shares with his opponents the assumption that medicine must be based on a theory of human *phusis*. This is just one illustration of the fact that despite the vehemence of the author's attack on his opponents, he and they actually share a good deal of common ground. In particular, they share a conception of medicine as a *technê*, an art or science made up of a set of procedures organised in a highly systematic fashion and based on an understanding of the *phusis* of its subject matter: the human body and the various factors that account for health and disease. This conception of *technê* was later developed by philosophers such as Plato and Aristotle and came under intense scrutiny in the debate between the so-called Rationalist and Empiricist doctors in the Hellenistic period; but the evidence suggests that it

was first clearly articulated within medicine itself, quite independently of the epistemological concerns that drove this later debate. We can grasp one reason why this conception arose in medical circles by considering the opposition between *technê* and *tuchê* (chance) that was a characteristic theme in Greek thought from the middle of the fifth century BC. As is well known, a number of Hippocratic authors were concerned to establish the status of medicine as a genuine art (*technê*) against those who claimed that it was merely a matter of chance (*tuchê*). To confront the claim that the successes of medicine were due to *tuchê*, not *technê*, the doctor needed to do more than just point to successful results; he needed to be able to show that those results were actually due to medical treatment. Hence the doctor needed knowledge of causes (*aitiai*), knowledge that would enable him to explain and justify his practice and so to establish a direct causal connection between that practice and a successful outcome (or indeed to explain why he was not at fault in cases of failure).<sup>2</sup> The importance of the concept of *phusis* in the *technê-tuchê* debate stems from the close connection between the notions of nature and cause. With the concept of *phusis* was associated the notion of the regularity of nature, the idea that phenomena had natural causes that could at least in principle be discovered by human beings and that were not due to arbitrary divine intervention. This emerges especially clearly in *On the Sacred Disease* (*De morbo sacro*), which opens with an argument against the view that epilepsy is caused by divine intervention on the ground that the disease has both a "nature" (*phusis*) and a "cause" (*prophasis*).<sup>3</sup> Knowledge of *phusis* brought with it the knowledge of causes, and hence the ability to explain and justify medical practice. This, then, is one reason why knowledge of *phusis* came to be considered an essential foundation of the medical *technê* by a wide range of medical authors, among them the author of *VM* and his opponents.

My second preliminary point concerns the place of chapter 20 in the author's overall argument. *VM* opens with a vigorous attack on thinkers who "lay down as a *hypothesis* for their account" (*ὑπόθεσιν αὐτοῖς ἑωντοῖσιν ὑποθέμενοι τῷ λόγῳ*, p. 118.2 Jouanna; 1.570 L.) one or more fundamental principles such as the hot, the cold, the wet,

<sup>2</sup> Cf. especially *On the Art* (*De arte*) 5 (pp. 228–230 Jouanna; 6.6–8 L.).

<sup>3</sup> Cf. Lloyd (1979) 49–55 on the development of the notions of nature and cause in the Hippocratic authors.

and the dry, and go on to reduce the causes of all cases of disease and death to one or more of these factors. Up to the beginning of chapter 20, the argument is directed against the claim that one or more of these factors is the cause and cure of all diseases. The beginning of chapter 20 thus seems to mark a fresh start, as the author turns to the claim that medicine must be based on an account of the origin and development of the human being from its elementary constituents. He nowhere attributes such a theory to the opponents attacked in chapters 1–19, nor does he ever associate the term *hypothesis* or the principles hot, cold, wet, and dry with the opponents attacked in chapter 20. But though he does not make the connection explicit, it seems very likely that the author considers the positions attacked in chapters 1–19 and chapter 20 to be closely related and to result from what is essentially the same mistaken procedure: the attempt to draw on the tradition of the Presocratic “inquiry into nature” (*peri phuseôs historia*) to give medicine the theoretical foundation it needed to qualify as a genuine *technê*. By the “inquiry into nature” I refer to the project of what may be called cosmological speculation that began in sixth-century Miletus and whose most prominent representatives in the latter part of the fifth century were thinkers such as Empedocles, Anaxagoras, and Diogenes of Apollonia. These thinkers attempted to give an account of the origin and development of the universe and of human beings within it.<sup>4</sup> The author makes a thinly veiled reference to this tradition in chapter 1 in remarking that the use of *hypotheses* is necessary when discussing “things in the sky and under the earth” (ὄλον περι τῶν μετεώρων ἢ τῶν ὑπὸ γῆν, p. 119.7 Jouanna; 1.572 L.), topics that were characteristic of Greek cosmological speculation. He refers more clearly to the tradition in section 20.2 in remarking that the opponents “tend towards philosophy like Empedocles or others who have written about nature from the beginning” and by using the term *historiê* to refer to the kind of knowledge that they consider an essential foundation for medicine. The distinction between the polemic of chapters 1–19 and chapter 20 is thus a matter of a difference of emphasis: in chapters 1–19 the focus is on that aspect of the oppo-

<sup>4</sup> A crucial passage for understanding the scope and approach of the Presocratic inquiry into nature is Plato, *Phaedo* 96 c. Jouanna (1992) rightly stresses the importance of this passage for the interpretation of the more “philosophical” Hippocratic writings such as *On Fleshes* (*De carnibus*) and *On Regimen* (*De victu*).

nents’ theorising that has the most direct implications for medicine, the reduction of the cause and cure of disease to a very small number of factors, while in chapter 20 the author steps back to discuss more generally the kind of *phusis* theory that underlies this position.

I now wish to examine more closely the kind of knowledge of human *phusis* that the author rejects here as irrelevant to medicine. In section 20.1 the phrase “how it [sc. the human being] originally came to be and from what things it was compounded” (ὅπως ἐγένετο πρῶτον καὶ ἀπόθεν συνεπάγη, p. 146.6–7 Jouanna; 1.620 L.) suggests an account of anthropogony, i.e. an attempt to explain how the first human beings arose from elementary constituents during the formation of the universe. Then in section 2 the author describes the knowledge on which his opponents propose to base medicine as the science (*historiê*) of “what the human being is and by what causes it comes to be and all the rest, with precision.” Here the present tense formulation of the question as concerning how human beings *come* to be (*gignetai*) suggests an account of the formation and development of humans in the present day, i.e. embryology. What unites these two formulations is a concern with origin and development: the opponents take an account of “what the human being is” to be an account of what human beings arise from and how they develop, whether in the present day or at a point in the distant past. In associating *phusis* with the concepts of origin and growth, these thinkers remain close to the etymological meaning of the word, which is probably derived from the verb *phuomai* (“to grow”).<sup>5</sup>

The author names Empedocles as a representative example of a thinker who engages in this kind of theorising about human *phusis*. Since the mention of an opponent by name is very rare in the Hippocratic writings, we should consider carefully why the author refers to Empedocles in particular here. The general characteristics of Empedocles’ work place him squarely in the tradition of the Presocratic inquiry into nature. He attempts to give a complete account of the origin and development of the cosmos and of the place of human beings in it on the basis of a small number of principles: the four elementary substances earth, air, fire, and water, and two motive forces, Love and Strife. Two distinctive features of Empedocles’ work

<sup>5</sup> For the etymology, see Kahn (1960) 201 n. 2.

help to explain why the author mentions him here. First, he had a keen interest in anthropogony and embryology. Several fragments and testimonia deal with the original formation of human beings, and the doxographers report an attempt to explain the formation of human tissues from the four elements that probably had its original place in a description of the emergence of the first human beings (DK 31 A 78).<sup>6</sup> In embryology, Empedocles treated such questions as menstruation (DK 31 A 80), sex differentiation and the resemblance of parents to children (DK 31 A 81), and the length of time it takes male and female embryos to develop (DK 31 A 83). His embryological accounts were closely linked to accounts of the first emergence of living things: according to DK 31 A 70 Empedocles held that trees were the first living things to emerge from the earth, and also drew an analogy between the way they were nourished by the heat in the earth and the way the embryo is nourished in the womb. Empedocles also takes a developmental approach to questions of physiology. The famous fragment in which he compares the eye to a lantern to elucidate its structure and function (DK 31 B 84) is in fact a description of the creation of the eye by Aphrodite, the personification of the cosmic force of Love.<sup>7</sup> Secondly, while earlier thinkers may have identified particular substances such as air or fire as fundamental, Empedocles is the first thinker to develop a clear concept of an elemental constituent. The Empedoclean elements earth, air, fire, and water are unchanging and indestructible, and all change results from their combination and separation. This concept of an elemental constituent made Empedocles the obvious figure to illustrate the concern to give an account of "from what things the human being was compounded" (ἀπόθεν συνενέργη). That Empedocles' own term for element is "root" (*rhizōma*), however, indicates that for him the elements are embedded within a larger, developmental framework and are much more than just constituent substances. The four elements or "roots" (*rhizōmata*) are both the origin of all things and

<sup>6</sup> For anthropogony see DK 31 B 62, and for the original emergence of other living things DK 31 B 60–61; cf. also DK 31 B 15. DK 31 A 72 (attributed to Aëtius) speaks of four stages in the coming to be (*genesis*) of animals and plants.

<sup>7</sup> DK 31 B 84: "As when a man who intends to make a journey prepares a light for himself, a flame of fire blazing through a wintry night . . . thus at that time (ὡς δὲ τότε) was the primal fire concealed in the round pupil . . ." The reference is to the time when Aphrodite first fashioned the eye: DK are right to remark "bei der Bildung des Auges" in their translation.

that to which all things return when destroyed. Like the Homeric gods, each has its own privileges (*timai*), and they share dominance over the world in an endless process of cyclical variation.<sup>8</sup>

The general approach to the study of living things suggested by this evidence is brought out clearly by Aristotle in a passage of *On the Parts of Animals* (*De Partibus Animalium*):

For coming to be (*genesis*) is on account of substance (*ousia*), not substance on account of coming to be. Hence Empedocles was wrong to say that many things belong to animals because it happened in this way during their coming to be, for example that they have a backbone of such a kind because it happened that it was twisted and broken. (*PA* 640 a 18–22 = DK 31 B 97)

From Aristotle's point of view, Empedocles errs in trying to explain the fully developed organism by reference to the way it comes to be, rather than explaining the processes by which it comes to be from a consideration of the nature of the mature organism. We need not accept Aristotle's commitment to a teleological approach to the study of nature to appreciate the correctness of this observation about the character of Empedoclean explanations. Aristotle's remark makes quite clear that Empedocles' approach to the study of the nature of a living thing is to try to give an account of how it came to be the way it is.

In response to the opponents' attempt to base medicine on this sort of developmental theory of human *phusis*, the author of *VM* claims that medicine must be based on an understanding of human *phusis* that has nothing to do with origin or development. Instead of a theory of how human beings *came to be* from simpler constituents, medicine must be based on a theory of what human beings *are* in relation to their regimen: "what the human being is in relation to foods and drinks and other practices, and what will be the effect of each thing on each individual" (20.3). It would be quite wrong to interpret this passage as indicating a commitment to a doctrine of philosophical relativism, as some commentators have done. As we have seen, the author is no sceptic about the possibility of attaining knowledge of human *phusis*. His position is that medicine must be based on the kind of knowledge of human *phusis* that will enable the

<sup>8</sup> For the elements as "roots" see DK 31 B 6.1; for their cyclical variation and equal "privileges" (*timai*) see DK 31 B 17.27–35. On the development of the doctrine of elements cf. Kahn (1960) 133–63.

doctor to relate human beings to their regimen in a systematic way.<sup>9</sup> As far as he is concerned, all knowledge of the formation and development of the human being is simply irrelevant to this purpose. What the doctor needs to know is not how human beings developed out of a set of primary elements but how the various foods, drinks, and other components of human regimen will affect each individual. This knowledge must be both highly precise and explanatory. It is not enough for the doctor simply to know that cheese is harmful; he must know what trouble cheese causes, why it causes it, and which of the things in the body it affects (20.3). The conviction that medicine must be based on a body of precise, explanatory knowledge that is directly relevant to medical practice leads the author to set out a theory of human *phusis* that has two primary aspects: (1) knowledge of the interactions between the fluid substances or humours present in different individuals and different foods and drinks, and (2) knowledge of the capacities of the internal organs to affect and be affected by fluids and air in the body.

The need for the doctor to have knowledge of the humoral constitution of the body and of foods emerges clearly in sections 20.5–6. The different effects that cheese has on different human beings imply that these individuals differ in *phusis*, and this difference is understood as a difference in the relative amounts and strengths of the humours in their bodies. If cheese has an especially powerful effect on a person, it is because the humour (*chumos*) that is disturbed by cheese “happens to be present in greater quantity and to exert more power” in that person’s body (τυγχάνει πλείων ἐνεῶν καὶ μᾶλλον ἐνδυναστεύων ἐν τῷ σώματι, p. 147.19–20 Jouanna; 1.624 L.). The theory is set out in more detail in chapter 14, where the author presents it as the culmination of the discovery of medicine by a group of nameless investigators in the distant past:

**14 3** For since they did not think that it was the dry or the wet or the hot or the cold or any other such thing that harmed human beings, or that human beings needed any of these things, but rather the strength of each thing, that which was too powerful for human nature (*phusis*), what the latter could not overcome—this they thought caused harm, and this they sought to remove. And the strongest of the sweet is the

<sup>9</sup> Pohlenz (1918) 405 correctly calls this knowledge of *phusis* “eine unmittelbare für die Praxis verwendbare Physiologie, die über das Verhalten des menschlichen Organismus zu Nahrung usw. aufklären und danach Diät und Therapie regeln will.”

sweetest, of the bitter the bitterest, of the sour the sourest, and of each of all the constituents, the extreme degree. 4 For they saw that these things are also in human beings and that they harm them: for there is in the human being salty and bitter and sweet and sour and astringent and insipid and myriad other things having powers of all kinds (*pan-toias dunamias*), in quantity and strength. These when mixed and blended (*memigmēna kai kekrēmēna*) with one another are neither manifest nor cause the human being pain; but when one of them is separated off and comes to be on its own, then it is both manifest and causes pain. (pp. 135.14–136.16 Jouanna; 1.602 L.)

According to this theory the body contains many different fluid substances or humours (*chumoi*), each of which is characterised by a particular flavor such as salty or bitter, and each of which has its own *dunamis*, a distinctive power or capacity to affect the body in a certain way.<sup>10</sup> To explain health and disease, the theory appeals to the notion of *krēsis* or blending; when these fluids are well mixed and blended with one another, the person is healthy, but when one is separated and stands apart, it causes pain. As we have seen in discussing the cheese example of chapter 20, the theory is also meant to explain the effects of different foods on different healthy individuals: different *krēseis* in both foods and individuals are distinguished by the amounts and strengths of the various humours making them up. The remainder of chapter 14 makes clear that this theory is based on a close analogy between the composition of the human body and the composition of foods. Just as foods cause harm only when they possess a strong, unblended flavor or humour (*chumos*), so the humours in the body cause harm only when they are unblended (14.5–6). The claim that the same substances are present in the body and in foods is probably based on a view of nutrition as occurring by the assimilation of like to like; at any rate the closest parallels to the author’s theory are found in accounts of plant nutrition that endorse this view.<sup>11</sup>

<sup>10</sup> Following Plamböck, I take the basic meaning of the term *dunamis* to be an abstract “capacity to affect”, derived from the verb *dunamai* (1964, 64). In *VM dunamis* is sometimes used of a quality such as hot or cold; cf. *VM* 16.1 (p. 139.4–6 Jouanna, 1.606 L.). But it is important to recognise that this is because the author conceives of each quality as having a specific capacity to affect the body.

<sup>11</sup> Cf. *On Diseases (De morbis)* IV, 34.1 (pp. 85.25–86.1 Joly; 7.544 L.): “For the earth contains innumerable virtues (*dunamēis*) of all kinds, for it provides every individual plant which grows in it with a humour (*ikmas*) similar to that humour which each plant possesses congenitally and which is akin to that plant—so that each plant draws from the earth nutriment such as the plant itself is” (tr. Lonie 1981). The

The detailed interpretation of the author's theory of *krēsis* involves a number of complex and somewhat obscure issues that I cannot discuss here.<sup>12</sup> My concern is simply to draw attention to the sharp contrast between this theory and Empedoclean-style theories of human *phusis*, a contrast that involves both the scope of the theory and the method used to reach it. Like Empedocles and a number of Hippocratic writers, the author gives an account of substances in the human body whose behavior accounts for health and disease. But he never claims that these are the constituents of everything in the universe, like the Empedoclean elements. Nor does he even claim to be able to give a complete account of the substances in the body: he says only that "there is in the human being salty and bitter and sweet and sour and astringent and insipid and myriad other things" (*VM* 14.4, p. 136.10–11 Jouanna; 1.602 L.). No claim is made about the role of these substances in the formation and development of the human being, nor are they said to undergo variation with the seasons like the four humours in *On the Nature of Man* (*De natura hominis*), a text which is widely considered to show Empedoclean influence. There is also a clear contrast of method between Empedoclean-style theories of human *phusis*, which are based on general cosmological considerations, and a theory like *VM*'s, which begins from the observation of the reactions of different individuals to different foods. Thinkers like Empedocles treated the origin of the human being in the context of a general theory of the development of the cosmos as a whole. In contrast, the author of *VM* insists on the need to begin with the study of the capacities (*dunamis*) of different individuals to assimilate different foods. The observation of such differing reactions provides the only reliable basis for drawing conclusions about human *phusis*, as in the cheese example of chapter 20. Such observation (we may note) is also of fundamental importance in the account of the discovery of medicine that the author presents in chapters 3–8.

The second main aspect of the author's theory of human *phusis* involves knowledge of the internal organs of the body. In particular, the doctor must have detailed knowledge of the relationship between their shape, consistency, and/or texture and their capacity

author makes this statement to support his view that human nutrition occurs by the assimilation of like to like; cf. *Morb.* IV, 33.3 (p. 85.19–24 Joly; 7.544 L.).

<sup>12</sup> For full discussion see Schiefsky (2005).

to act on or be affected by fluids and air in the body. The following passage from near the beginning of chapter 22 illustrates the author's approach:

**22 2** Now which structures would best be able to attract and draw moisture to themselves from the rest of the body: the hollow and extended, the solid and round, or the hollow and tapering? I think it is these, the ones that taper from wide and hollow to narrow. **3** But one must learn these things from evident things outside the body. For on the one hand, if you keep your mouth wide open you will not be able to draw up any liquid, but if you thrust your lips forward and contract and compress them, you will draw some up; and indeed, if you go on to place a tube upon them, you will easily draw up whatever you like. Again, cupping instruments that are applied to the skin and taper from wide to narrow have been crafted for the purpose of attracting and drawing fluid from the flesh; and there are many other examples of this kind. **4** Of the structures within the human being the following have such a nature (*phusis*) and shape: the bladder and the head, and the womb in women. These obviously attract most of all and are always filled with acquired moisture. (pp. 149.10–150.8 Jouanna; 1.626–628 L.)

The author begins by asking which shapes are such as to attract fluids. Based on experience with things external to the body, such as straws and cupping instruments, he concludes that things that are hollow and tapering are best able to do this. He then draws on his knowledge of the shape of the internal organs to infer that it is the bladder, the head, and the womb that are especially able to attract fluids. The author's concern here is not with anatomy, if we understand anatomy to refer solely to the structure or consistency of the internal organs, independent of their capacity to act on and be affected by the substances in the body. Throughout the chapter he displays familiarity with such features of the internal organs as their shape, texture, and consistency. The spleen, the lung, and the breasts he knows to be spongy and porous, and so he concludes that they are especially suited to absorb moisture (*VM* 22.6, p. 150.13–17 Jouanna; 1.628 L.). The liver is broad and resistant but also tender, swollen, bloody, and close in texture, so that it suffers sharp and frequent pains from the effects of wind in the body (*VM* 22.8, p. 152.1–13 Jouanna; 1.632–634 L.). The diaphragm is broad and resistant but also more sinewy and stronger than the liver; hence it suffers less pain (*VM* 22.9, p. 152.13–17 Jouanna; 1.634 L.). In sum, knowledge of the shape and consistency of the internal organs is



presupposed; what the doctor needs in addition is knowledge of how they will act on and be affected by the substances in the body. This knowledge is to be gained by drawing analogies with everyday experience (the use of a straw to draw up liquids) and experience in medicine (the use of cupping instruments to draw fluids from the body).

Once again we may distinguish the author's theorising about the internal organs from Empedoclean-style accounts in terms of both scope and method. His discussion of the internal organs makes no mention of their formation; the entire discussion is concerned with their behavior in the mature human being. Moreover it is restricted to a study of the interactions between the organs and the substances in the body; the author does not discuss topics such as the operation of the sense organs, an understanding of which is apparently considered an essential part of medicine by some medical authors.<sup>13</sup> As for method, it has often been noted that the author's recommendation to use analogies with familiar processes to suggest hypotheses about matters that cannot be directly observed is similar to Empedocles' use of analogy to elucidate the working of the eye or the process of respiration (DK 31 B 84, B 100). But two features at least distinguish the author's use of the analogical method from Empedocles'. First, the author uses analogy to gain knowledge about matters concerning which he already knows a great deal. He already has a substantial amount of knowledge about the internal organs; he uses analogy to learn about how they behave in the body. Secondly, the hypotheses that he formulates using analogy are confirmed by his medical experience and serve to explain that experience. Thus he concludes section 22.4, quoted above, by stating a fact of medical experience which confirms the hypothesis that he formulated on the basis of analogy: the bladder, head, and womb are known to attract fluids most of all and to be filled with liquid drawn in from elsewhere. This carefully controlled appeal to analogy to extend medical knowledge and to explain facts of medical experience stands apart from Empedocles' use of analogy to elucidate obscure physiological processes that arguably have no relevance to the practice of medicine.

Reduced to its bare essentials, the methodological contrast between the author and his opponents is a contrast between the attempt to

<sup>13</sup> A prime example is *Cam.*; cf. Jouanna (1992).

explain the fully-formed human being in terms of its development from simpler constituents, and a theory that takes the mature human being as its starting point and investigates the effects that different foods have on it. When the author claims that the only way to attain a developmental account of human *phusis* is by first attaining a complete grasp of medicine, he is claiming that the entire approach of attempting to explain the fully formed living thing by giving an account of its development from simpler constituents is mistaken. The way to proceed is not to try to understand the nature of the mature human being from its development, but to try to infer the process of development from the study of the mature human being. In this respect, the author's stance towards Empedocles and his followers is similar to that of Aristotle, who insists that the study of fully-grown organisms must precede any investigation of their origin and development.<sup>14</sup>

Finally we may return to the author's remarkable statement in section 20.2 that the developmental knowledge of human *phusis* which his opponents claim to have can be attained, but only if one has mastered all of medicine. The author evidently thinks that a complete mastery of medicine will enable the doctor to draw reliable conclusions about the formation and development of the human being. Medical experience, in other words, is the only reliable foundation for developing accounts of embryology or anthropogony. The author presumably understands the complete mastery of medicine to involve a thorough understanding of the effects of all aspects of regimen on individuals with different humoral constitutions, as well as a full account of the internal organs and their behavior. It might also involve the systematic study of the behavior of the humours outside the body (cf. *VM* 24, p. 153.7–19 Jouanna; 1.634–636 L.). To derive an account of human origins and development from a complete mastery of medicine as the author understands it would require drawing conclusions about the past state of the human being from its present state and behavior. This would presumably involve

<sup>14</sup> Cf. *PA* 640 a 18–22 (quoted above, p. 77). In saying this I do not mean to suggest that the *reasons* that led Aristotle to this criticism were the same as those that led *VM* to his view. What motivates Aristotle to criticise Empedocles' approach to the study of living things is a commitment to teleological explanation; *VM* is concerned instead to stress the speculative character of Empedocles' approach and its irrelevance to medicine.

the use of the analogical method, given the impossibility of investigating such questions through direct observation. It is important to note that the author has no objection to using analogy to draw conclusions about the past from the present; such reasoning in fact underlies the account of the discovery of medicine that he presents in chapters 3–8.<sup>15</sup> In a similar fashion, he might have thought it possible to draw on a complete knowledge of the behavior of the fluid substances now present in the body and the internal organs to reach reliable conclusions about the way in which those substances and organs were originally formed.

I shall close on a somewhat more speculative note. Since the author is attacking opponents who give an account of human origins and development in a cosmological context, it is possible that he thought that a complete account of human origins and development, appropriately derived from the study of medicine, would have implications for cosmology as well. If one could somehow develop a satisfactory account of the substances from which the human being originated, that might allow conclusions to be drawn about which substances played the major role in the original formation of the cosmos. We might thus imagine that the author envisioned the formulation of a general anthropogony and cosmology as the culmination of the study of medicine. This is a rather tantalising possibility, but it seems to me unlikely to be correct in light of the author's emphatic statement in chapter I that no clear knowledge is possible concerning "things in the sky and under the earth":

**I 3** For this reason I have deemed that medicine has no need of a newfangled hypothesis like things obscure and dubious, concerning which it is necessary to make use of a hypothesis if one undertakes to say anything; for example, concerning the things in the sky or under the earth. If anyone should recognise and state how these things are, it would be clear neither to the speaker himself nor to his listeners whether what he says is true or not, for there is nothing to which one could refer to attain clear knowledge. (p. 119.4–11 Jouanna; 1.572 L.)

This passage, I suggest, expresses a cautious ideal of empirical verifiability: theories about invisible things can be confirmed if there is some way to assess them on the basis of human experience. But while the author evidently thinks that inferences to the internal state

<sup>15</sup> Cf. Jouanna (1999) 239 on the author's use of analogy as a method for reconstructing the past.

of the humours in the body or the behavior of the organs fall within the realm of such empirical verifiability, it is hard to see how any inference about "things in the sky and under the earth" ever could. No matter how rich a base of experience we may accumulate, these topics are simply so far removed from human experience that we cannot hope to gain clear knowledge of them.

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