

## XI. The Concept of *Dynamis* in *De victu*

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Χωρεῖ δὲ πάντα καὶ θεῖα καὶ ἀνθρώπινα ἄνω καὶ κάτω ἀμειβόμενα—thus writes<sup>1</sup> the “philosophic”<sup>2</sup> author of the medical work *De victu* in the Hippocratic *Corpus*, succinctly crystallizing in general “Heraclitean” terms<sup>3</sup> the basic principle underlying his whole work. This principle is fundamental to his conception of the whole *cosmos* which, in his view, is characterized essentially by motion and change, by reciprocal and complementary processes.<sup>4</sup> Equally, it is fundamental to his conception of the *physis* of man which, since it is a part of the *cosmos* and indeed an *apomimēsis* of the *cosmos*,<sup>5</sup> must likewise be essentially characterized by motion and change. For the author as physician, therefore, the attempt to understand the nature of health and disease involves comprehension of the *physis* of man primarily in relation to motion and change, as well as their source and cause. This assumption is the basis on which the author establishes the theory of his medical

<sup>1</sup> *Vict.* 1.5.1–2 (citations are according to the text of W. H. S. Jones, *Hippocrates* 4, Loeb Classical Library, 1931).

<sup>2</sup> The author's relationship to natural philosophy might well be expressed in the words of Aristotle who, contrasting the concern of the *physikos* and the *iatros* with health and disease, says that most of the former begin with first principles and end with some consideration of medicine, while in the case of physicians οἱ φιλοσοφώτερος τὴν τέχνην μετιόντες . . . ἐκ τῶν περὶ φύσεως ἄρχονται περὶ ἰατρικῆς (*De sensu* 436A.17–436B.1; cf. *De resp.* 480B.23–30).

<sup>3</sup> On the influence of Heraclitus and other Pre-Socratics, cf. C. Fredrich, *Hippokratistische Untersuchungen* (Berlin 1899), 123–59. It is probable that Fredrich, who viewed the author as a “compiler,” overestimated the precision and immediacy of these influences. The influence is rather that of several basic principles and ideas of natural philosophy which the author develops and adapts to his own purposes. On his relationship to Heraclitean thought, cf. G. S. Kirk, *Heraclitus, The Cosmic Fragments* (Cambridge 1954) 21–9, who, however, discounts too greatly the influence of Heraclitean ideas and wishes to date *De victu* too late.

<sup>4</sup> Reciprocal and complementary motions and changes on the cosmic level are described and illustrated in *Vict.* 1.3–5.

<sup>5</sup> Cf. *Vict.* 1.10.3: ἀπομίμῃσιν τοῦ ὅλου, μικρὰ πρὸς μεγάλα καὶ μεγάλα πρὸς μικρά, and the development of the microcosm–macrocosm analogy in the remainder of the chapter. For one important aspect of reciprocal change in the body, cf. 1.6.1–12. The real subject of the “digression” in 1.11–24 is the revelation of change and process in man's *physis*, as shown by the analogy to the *technai*. Cf. 1.11.1–6 and 1.12.1–3.

*techné*, which he constructs with much careful attention and explicit reference to first principles. Considering the nature of his first principles, it is natural that the concept of *dynamis*<sup>6</sup> should play a role of unusual importance in the development of his thought. As it is utilized, *dynamis* is in fact the key concept of the author for the understanding of man's *physis* and for the formulation of his medical theory.

The author begins his treatise with a brief discussion and appreciation of the "research" and "discoveries" of those physicians who had previously written on human regimen,<sup>7</sup> then presents a carefully articulated summary of his own theory of medicine. The absolute requirement for the physician concerned with the regimen of man is to know and distinguish (*gnônai kai diagnônai*) the *whole* nature of man.<sup>8</sup> He must know of what primary elements man is composed and he must distinguish by what parts (*merôn*) the *physis* is "mastered." If the physician does not know τὴν ἐξ ἀρχῆς σύστασιν of the elements in the body, it will be impossible for him to know τὰ ὑπ' ἐκείνων γινόμενα. And if he does not know τὸ ἐπικρατέον ἐν τῷ σώματι, he will be incapable of applying to man things that are suitable. This basic statement lays stress immediately upon the elements not just as material principles but as forces acting within and upon the *physis*. The grounds for this approach are revealed more explicitly in his description of the primary elements and the original constitution<sup>9</sup>: all other animals and man, the author writes, are composed of two elements, fire and water, disagreeing (*diaphoroin*) in their *dynamis*

<sup>6</sup> The concept of *dynamis* had been of much importance in Greek medicine and natural philosophy since Alcmaeon's theory of the *krasis* of the *dynamis* of the body, *isonomia* of the "powers" producing health, the *monarchia* of any "power" resulting in illness (Diels-Kranz, *Vors.*<sup>7</sup> 24B.4). On the origin and development of the conception of *dynamis*, cf. F. M. Cornford, *Plato's Theory of Knowledge* (London 1935) 234 ff., based upon J. Souilhé, *Étude sur le terme Δύναμις dans les dialogues de Platon* (Paris 1919). Perhaps the essential meaning of the term is best conveyed in Plato's *Phaedrus* 270D, where he defines the *dynamis* of a thing as τίνα πρὸς τί πέφυκεν εἰς τὸ δρᾶν ἔχον ἢ τίνα εἰς τὸ παθεῖν ὑπὸ τοῦ.

<sup>7</sup> Here and elsewhere in his work the author shows much awareness of "research" and "discovery" and of method in medicine. His main criticism here is that no one has yet treated regimen *panta dia pantos* (1.1.3), or *to holon* of regimen (1.1.10). For the limits of the possibility of exactness in regimen and his own "discovery," cf. 1.2.40 ff., 3.67, and 3.69.10 ff.

<sup>8</sup> 1.2.1-10. The distinction made in the use of the verbs *gignôskô* and *diagignôskô* is one of which the author is quite conscious, and *diagnôsis* is an important concept for him. Cf. e.g. 1.32.77-9.

<sup>9</sup> 1.3.1-11.

but agreeing (*sympphoroin*<sup>10</sup>) in their use or functioning (*chrêsin*). These two elements, together with each other, are sufficient both for all other things and for each other, while each, separately, is not sufficient<sup>11</sup> either itself for itself or for any other thing. Further, the *dynamis* of fire is to move (*kinêsai*) "all through all," the *dynamis* of water is to nourish (*threpsai*) "all through all."<sup>12</sup> Thus, each element alternately masters the other, or is mastered, to the highest and to the lowest degree possible.<sup>13</sup> In this description of the nature of the primary elements which compose the *physis* of man and all else in the *cosmos*, it is manifest that the author emphasizes as basic the motion and change of the elements, and their capacity for mutual and reciprocal action. It is not fire and water as substantial which are essential to his comprehension of *physis*, but the *kinêsis* of fire and the *trophê* of water.<sup>14</sup> For it is these *dynamis* of the primary elements which afford to him an explanation of the ultimate source and causation of all motion and change in the *cosmos* and man's *physis*. This view profoundly influences the author's approach to all the phenomena he treats.

*Kinêsis* and *trophê* are then the primary and essential *dynamis* of fire and water. But the analysis of the nature of the primary elements is not yet exhausted. To fire must also be assigned<sup>15</sup> as properties τὸ θερμὸν καὶ τὸ ξηρόν, while to water must be assigned τὸ ψυχρὸν καὶ τὸ ὑγρόν. Further, because of the interaction and interdependence of fire and water, fire must have "the moist" from water (since there is moisture in fire), and water must possess "the dry" from fire (since there is dryness in water). In this

<sup>10</sup> The terms *diaphoros-symphoros* are often used to describe the complementary and harmonious nature of opposite processes (cf. especially 1.17 and 1.18.5), doubtless in imitation of Heraclitus; cf. Kirk (note 3, above) 175.

<sup>11</sup> Cf. the *autarkeia* of fire and water in the soul (1.35.6-10) and the attribution of self-sufficiency to the first principle by Aristotle *Met.* 1091b.16-19.

<sup>12</sup> The author's several uses of *panta dia pantos* is a circumlocution surely imitative of the similar expression in Heraclitus (*Vors.* 22b 41). Cf. 1.10.25 where it is said that the hottest fire πάντα διὰ παντὸς κυβερνᾷ, καὶ τὰδε καὶ ἐκείνα, οὐδέποτε ἀτρεμίζον.

<sup>13</sup> In the remainder of the passage (1.3.12-26) the author explains why, because of the reciprocal action of each element upon the other, neither may ever master the other completely, repeating that fire and water are sufficient *pasi dia pantos* to the highest and lowest degrees possible.

<sup>14</sup> The author's views concerning his elements were perhaps influenced both by Heraclitus and other early thinkers also. Cf. Aristotle's objections to earlier views that fire is the cause of motion (*Met.* 984b.5 ff.) and that fire is nourished by moisture (*De gen. et corr.* 335a.15 ff.; *Meteor.* 354b.34 ff.).

<sup>15</sup> 1.4.1-6.

formulation the author is quite apparently attempting to harmonize the four traditional "opposites" of some earlier thinkers in medicine and natural philosophy with his two primary elements<sup>16</sup> in a fashion that will be consistent with his empirical medical knowledge. On this basis all things in the *cosmos*, considered "philosophically" as to their ultimate principles and constitution, may be resolved into the original elements of fire and water, with their proper *dynameis* of motion and nourishment. But these elements manifest themselves to the senses in actually existing things as the hot and the dry, the cold and the moist, each of these being considered as a *dynamis* and having its individual capacity for acting. In his total interpretation of the primary elements, therefore, the author derives from fire three active properties: *kinêsis* and the hot and the dry, and from water also three: *trophê* and the cold and the moist.

It is on the basis of this conception that the author proceeds in the remainder of his first book to undertake to explain the ultimate origin of *genesis* and many aspects of the *physis* of man. Since fire and water have such properties, he continues, and since they are always in motion and change, they separate off from themselves many different forms (*ideas*) of seeds (*spermatôn*) and animals similar in no respect to each other, either in appearance (*opsis*) or in *dynamis*.<sup>17</sup> Significantly the author utilizes the concept of *dynamis* here in the genesis and differentiation of the seeds—not *physis*, as one might anticipate. But it is quite appropriately used, because he thinks of the *spermata* and animals resulting from the "separation off" from the elements most basically from the point of view of their active properties as derived from the elements. That is to say, the essential meaning of *physis* for the author, because of the first principles which he has postulated and the assumptions which he has made concerning them, is determined by the *dynameis* of the elements. This view of *physis* is clearly revealed in his treatment of the causes operative in the generation and

<sup>16</sup> This attribution of *dynameis* to the elements is not unexampled. Cf. Philistion, who identified one of the four "opposites" with each of the four elements (cf. *Anonymus Londinensis* 20.25 ff.) and Aristotle, who associates each element with a pair of *dynameis* (*De part. an.* 646A.13 ff.).

<sup>17</sup> 1.4.6 ff. The unceasing change and combination of the elements as the cause of differentiation is strongly stressed: ἄτε γὰρ οὐποτε κατὰ τὸ αὐτὸ ἰστάμενα, ἀλλ' αἰεὶ ἀλλοιούμενα ἐπὶ τὰ καὶ ἐπὶ τὰ, ἀνόμοια ἐξ ἀνάγκης γίνεται καὶ τὰ ἀπὸ τούτων ἀποκρινόμενα. In the rest of the chapter the interpretation of genesis and destruction as the changing, the mingling and separation of the elements is elaborated at length.

growth of the body.<sup>18</sup> It is especially well illustrated in his attempt to give a naturalistic description of the development of the foetus from the *sperma*.<sup>19</sup> The explanation of this whole process relies upon the *dynamis* of the fire and water contained in the *sperma*. It is the *kinêsis* of fire, acting upon and moving the moisture of the *sperma*, and the reciprocal furnishing of *trophê* to fire by the moist, which constitute the basic process. This process results in the consumption of some of the moisture by the fire and the consequent drying and solidifying of parts of the *sperma*, leading to the formation of bones and tissues as well as the hardening of the exterior of the *sperma*. Fire then being enclosed within the compacted shell of the *sperma*, διακοσμεῖται τὸ σῶμα κατὰ φύσιν διὰ τοιγύδε ἀνάγκην: becoming abundant and consuming the moisture of the *sperma*, fire in time is lacking in *trophê* from the moist. Seeking *trophê*, therefore, the fire enclosed in the belly bursts through and forms passages for nourishment and breath, while the fire enclosed elsewhere in the body forms the veins as *periodous* for itself. As the author sums up the activity of fire in this process<sup>20</sup>: ἐνὶ δὲ λόγῳ πάντα διεκοσμήσατο κατὰ τρόπον αὐτὸ ἐωυτῶ τὰ ἐν τῷ σώματι τὸ πῦρ.

This principle of the activity of the *dynamis* is applied to many physical phenomena, but it is particularly fundamental for the analysis of the original constitutions of the body.<sup>21</sup> For although the body of every animal always differs from any other,<sup>22</sup> several possible constitutions may be described as basic types to facilitate *diagnôsis* by the physician of the individual *physis*. These consist of six possible blendings (*synkrêsis*) of fire and water, of varying quantity and gradation, which determine the *physis* and the activity of the *dynamis* and, therefore, the health or illness of the body when it is attacked by excess of fire or water or other changes. The nature of the body in each case depends upon the original blending of fire and water, and regimens characterized by fire

<sup>18</sup> 1.7-8 and 25-31.

<sup>19</sup> 1.9.1 ff.

<sup>20</sup> 1.10.1-2. The microcosm-macrocosm analogy is then developed, and in 1.10.11-26 the *periodoi* of fire in the body are described more fully, all the basic processes of *physis* being attributed to the "hottest and strongest fire."

<sup>21</sup> 1.32.

<sup>22</sup> 1.28.4-10. As it is expressed most explicitly: σῶμα δὲ οὐδέποτε τῶντὸ οὐδέενος οὔτε κατὰ φύσιν οὔθ' ὑπ' ἀνάγκης, τὸ μὲν γὰρ διακρίνεται ἐς πάντα, τὸ δὲ συμμίσγεται πρὸς ἅπαντα.

and water are suggested for maintenance or restoration, after illness, of the original *synkrêsis*. On the same principle the variations of the human constitution in the several periods of life are enunciated, and the causes of these natural variations explained by the relative mastery of fire and water in the several periods, with resulting variation of the *dynameis*.<sup>23</sup> In similar fashion the differences between the male and the female constitutions are described. In origin, in growth and in regimen, the male is hotter and drier, the female is moister and colder.<sup>24</sup> This careful analysis of the human constitution from several points of view in terms of its *dynameis* is of much significance, since it will be the necessary basis for the author's theory of regimen and health.

It is not only the nature of the *sôma* which is clarified by means of the first principles, however; the theory of the intelligence of the *psychê* of man is formulated on the same grounds.<sup>25</sup> In general principle, according to the theory offered here, the *phronêsis* of soul is relative to the proper functioning of the *dynameis* of fire and water. And this proper functioning is determined and controlled by the proportional *synkrêsis* of the elements. The conditions of the best intelligence may be stated in principle thus: the blending of the moistest fire and the driest water in the body produces the best intelligence, for fire has the moist from water, and water has the dry from fire. This proportional blending renders each element sufficient (*autarkês*) to itself and to the other element, so that the motion of the *psychê*, because of the *kinêsis* of fire, may be most natural and proper. When the blendings of fire and water fail to be proportionate in quantity or quality, the consequence is that the motion of the *psychê* is either too fast or too slow (because of the mastery of either fire or water in the blending), so that the intelligence of the soul is altered in various ways and degrees. Six possible blendings and their effects upon the soul are delineated by the author. If fire, for instance, receives in the blending *dynamis* less than that of water, the soul will be less perceptive since its *períodos* will be slower.<sup>26</sup> If water receives the lesser *dynamis*

<sup>23</sup> 1.33. E.g., the young man is blended of the hot and the dry, the former because the *ephodos* of fire masters the water, the latter because the moisture of the child's blending is already consumed, some of it for the increase of the body, some for the *kinêsis* of fire, and some through activity and exercise.

<sup>24</sup> 1.34.

<sup>25</sup> 1.35.

<sup>26</sup> 1.35.53 ff.

and the fire has a pure blending, the soul is intelligent.<sup>27</sup> But if the *dynamis* of water is mastered more greatly by that of fire, the motion of the soul is swifter and the intelligence less steadfast in proportion to its swifter motion.<sup>28</sup> Throughout the entire discussion of the intelligence of the soul, the ultimate factors of causation are the *dynamis* of the constituent elements, fire and water, as they are also in the case of the body.<sup>29</sup>

In the first book of *De victu*, therefore, there is a consistent and self-conscious attempt made to analyze and understand the *physis* of man as a whole, both body and soul, and its origin and development, on the basis of the primary elements. Throughout this whole approach it is the conception of the *dynamis* of the material principles which is fundamental. For it is the *kinêsis* of fire and the *trophê* of water, along with the hot and the dry, the cold and the moist, which provide the deepest insight into *physis* and make it possible to visualize the processes and phenomena of *physis*. In this very dynamic conception the *physis* of man is, in essence, a complex of *dynamis* acting and interacting upon each other without cessation, hence constantly producing and undergoing change and alteration. These mutual and reciprocal changes and processes of the *physis* must and do maintain a proportional *synkrêsis* and balance in the normal and healthy functioning of body and soul. But this inner *synkrêsis* of man's *physis*, as will be seen, must also be maintained relative to all the external and variable forces which may affect the *physis* from without.<sup>30</sup> This is the principle upon which the second aspect of the author's theory of medicine depends. It is exemplified first in his statement concerning man's nourishment<sup>31</sup>: the physician must be able to determine in the case of all foods and drink δύναμιν ἥντινα ἕκαστα ἔχει καὶ τὴν κατὰ φύσιν καὶ τὴν δι' ἀνάγκην καὶ τέχνην ἀνθρωπίνην. For he

<sup>27</sup> 1.35.86 ff.

<sup>28</sup> 1.35.101 ff.

<sup>29</sup> From this theory it follows (1.36) that the intelligence of soul, since it depends upon the *synkrêsis* of fire and water, may be altered by regimen. If fire masters water in the blending, water may be increased by means of the adaptation of regimen; and when water masters fire, it is possible to increase the fire, thus restoring the proper blending. This principle of regimen had already been applied in some detail in the previous chapter.

<sup>30</sup> This important principle, which will be fully developed by the author, is somewhat similarly expressed by Aristotle, *Physics* 246b.4-7, who says speaking of the body: ὑγιείαν καὶ εὐεξίαν ἐν κράσει καὶ συμμετρίᾳ θερμῶν καὶ ψυχρῶν τίθμεν ἢ αὐτῶν πρὸς αὐτὰ τῶν ἐντὸς ἢ πρὸς τὸ περιέχον. Cf. *De gen. an.* 767A.30 ff.

<sup>31</sup> 1.2.11 ff.

must know how through *technê* to take away the *dynamis* of those foods which are strong (*ischyrôn*) by nature and to add strength (*ischyn*) to foods that are weak by nature. The means by which this requirement may be implemented are treated at length in the second book of *De victu*, after an introductory discussion of the natural environment.

The examination<sup>32</sup> of the effects upon man of the natural forces of the environment in which he lives, their causes and conditioning factors, makes use of the hot and the dry, the cold and the moist as active properties. Primarily responsible for the natural forces are the sun and the position (*thesis*) and *physis* of the various lands, along with their winds. For it is the *thesis* of any land relative to the sun and to other lands, combined with its several topographical features, which determines ultimately the variable presence or absence of heat and dryness, cold and moisture. These *dynamis* then affect all animals and "the things growing from the earth" and man, both through his foods and the air he breathes.<sup>33</sup> Because winds are especially important agents, the physician must know what *physis* and *dynamis* each wind possesses. All winds, in their original nature, cool and moisten both animals and plants (since there is *pneuma* in all other things as well as in animals) because all winds must originate in the cold and moist regions of the earth. But the winds of various regions differ because they become hotter or drier, or colder or moister, according to the *thesis* and topography of the lands through which they must pass. The original nature and properties of winds may accordingly be altered. The north wind is by nature cold and moist because of its origin; but since it passes through regions which the sun does not heat and dry, its moisture is not consumed, and it reaches the southern lands still having its own *dynamis*.<sup>34</sup> The south wind, on the contrary, though it is cold and moist in its original nature, becomes hot and dry because its moisture is

<sup>32</sup> 2.37 and 38.

<sup>33</sup> Note that the author explains the effects of the *dynamis* in terms of their action upon each other. Quite consistently with his earlier views of *kinêsis* and *trophê*, he thinks of the hot and the dry as "moving" the cold and the moist, and of the moist as furnishing "nourishment" to the hot and the dry. Cf. 2.37.21 ff.: hollow waterless regions dry and heat the body, both because of the dryness of their foods and because τὸ πνεῦμα, ὃ ἀναπνέομεν, ξηρόν ἔόν, ἔλκει ἐκ τῶν σωμάτων τὸ ὑγρὸν εἰς τροφήν ἑωυτῶ, οὐκ ἔχον πρὸς ὃ τι ἂν ὑγρότερον προσπίπτον τρέφεται. Cf. similarly 2.38.33-45 and 64-69. In 2.38.61-64, certain winds may be helpful, τῷ τῆς ψυχῆς θερμῷ ἱκμάδα δίδοντα.

<sup>34</sup> 2.38.20 ff.



evaporated as it moves through lands heated and dried by the sun. In the regions nearest these lands, then, it is necessary for the south wind *τοιαύτην δύναμιν ἀποδιδόναι θερμὴν καὶ ξηρὴν* since it "drinks up" the moisture of animals and plants. The same wind, hot and rare when it has crossed the sea and become hot and moist, must moisten the lands it reaches. Likewise the *dynamis* of other winds are altered by the properties of lands because of their *thesis* and *physis*.

The author then turns to the consideration of the effects of foods and drink upon man, amplifying his earlier theoretical statement of principle and discussing the method by which the physician should treat the *dynamis* of foods.<sup>35</sup> He emphasizes that the physician must know the properties of each food and drink individually, both *kata physin* and *dia technēs*. Therefore he rejects the procedure of earlier doctors who had attempted to describe the *dynamis* of sweets or fats or salts or other such substances *kata pantos*. For, he argues, sweet things or salt things or other foods, considered as a class, do not all have the same *dynamis* as each other. Some sweet substances are diachoretic, some are astringent, some dry and some moisten. The same principle holds true of *τῶν θερμαντικῶν* and all other classes of substances: *ἄλλην ἄλλα δύναμιν ἔχει*. Therefore what the properties of individual things are really cannot be revealed with reference to foods as classes. Consequently the author undertakes to describe what *dynamis* foods and drinks have *καθ' ἑκάστα*. He then proceeds to enumerate the various grains, meats, fruits, and drinks one by one and to indicate the properties of each and the effects upon the body.

The analysis of barley which introduces the treatment of foods may serve as an illustration of the author's method in general.<sup>36</sup> Barley is *physei* cold and moist, and it dries. There is also *kathartikon ti* in barley from the juice of its chaff.<sup>37</sup> Roasted barley loses its moist and cathartic properties because of the action of the fire, so that that which is left remaining is cold and dry. Barley meal, roasted and made into a cake, will cool and dry

<sup>35</sup> 2.39.

<sup>36</sup> 2.40. The treatment of barley is especially detailed because of its importance in diet. Few of the other foods require so extensive an analysis.

<sup>37</sup> As evidence for this property, the author cites the fact that, if unground barley is boiled, the liquid purges strongly; if ground barley is boiled, the liquid cools and "binds."

whatever requires this: such is the *dynamis* of the barley-cake. Barley meal alone is more nourishing but less diachoretic than when it is eaten along with the bran. The barley-cake, kneaded in advance but moistened with water and unpounded, is cooling (because of the cold water), diachoretic (because quickly digested), and light, because much of the nourishment passes out of the body with the breath.<sup>38</sup> When barley-cake is consumed immediately after preparation, it dries because the barley meal is dry, moisture being present only from the preparation of the cake. Being hot, the barley-cake draws the moisture of the belly since it is the nature of the hot to draw the cold, and the cold the hot. The belly must then grow dry since its moisture is consumed by the dryness and the heat of the barley-cake, while it becomes cool because of the water in the cake. Used in this fashion, barley-cake cools and dries anyone with diarrhea and any condition of heat. Dry and well-kneaded barley-cake dries less because it is more condensed. But it is very nourishing because the passages of the body accept the cake as it gradually liquefies and passes without producing wind. In this manner the author clarifies the original properties of barley *physei* as well as the properties of barley as altered *dia technês*, along with the effects of each upon the body.

This passage is typical of the procedure of the author in his very comprehensive analysis of the properties of food and drink.<sup>39</sup> Repeatedly foods are described as hot or dry or cold or moist by nature and therefore as heating and drying or cooling and moistening the body. This approach rests upon the assumption that man's *physis* and his food and drink are composed ultimately of the same elements and manifest the same active properties. To comprehend the phenomena of the nutrition of the *physis* necessitates knowledge of the activity of the component *dynameis*. Primarily the *dynameis* are conceived as acting and interacting upon each other: the hot heats and dries the moist or the cold by "moving," attracting or consuming the cold and the moist<sup>40</sup>; the moist in turn "nourishes" the hot or the dry by moistening or

<sup>38</sup> The explanation of "lightness" is physiological. Cf. 2.39.18-24: because the passages for nourishment, being too narrow, reject the nourishment, part of it, being thinned out, is secreted with the breath, while part, remaining, produces wind.

<sup>39</sup> 2.39-56.

<sup>40</sup> For the hot as drawing (*helkô*) the moist and the cold and consuming it, cf. e.g. 2.40.28-30 and 2.52.4-5.

cooling them.<sup>41</sup> This is the basic process. These primary effects of the interaction of the *dynamis* in the body may then affect the body generally, heating or cooling it, etc., and may also lead to further, specific physiological effects. Thus foods may be described as stronger or lighter, more or less nourishing, as diachoretic, cathartic, flatulent, diuretic or the opposite. These physiological effects of the *dynamis* of foods the author understands and attempts to explain on the basis of the action in the body of the hot and the dry, the cold and the moist.<sup>42</sup> The action of other, obvious properties of foods and drinks, the sweet, the salt, the bitter, the acid, etc., the author tries to interpret in terms of the same "opposites." This and other aspects of his views of nutrition become more apparent from his final remarks concerning the properties of foods and drink.

The basic principles of this view of nutrition are reflected with some clarity at the conclusion of the analysis of foods. Here<sup>43</sup> some general directions, based upon the active properties of foods, are offered to the physician for the regulation of regimen, and there is some attempt to make some classifications of foods according to their *dynamis*. Once again, the author refers to the primary elements. It is necessary for the physician, εἰδὼτα ὅτι πυρὶ καὶ ὕδατι πάντα συνίσταται, καὶ ζῶα καὶ φυτά, καὶ ὑπὸ τούτων αὐξέται καὶ ἐς ταῦτα διακρίνεται to decrease or increase the *dynamis* of the various foods in the following ways: decrease the *dynamis* of strong (*ischyrôn*) foods, boiling them often and cooling them; take the moisture out of moist foods, applying fire to their preparation<sup>44</sup>; decrease the *dynamis* of dry foods by moistening them, of salt foods by wetting and boiling, of bitter and acid foods by combining them with sweet things, of astringent foods by combining them with oily foods.<sup>45</sup> The treatment of other foods,

<sup>41</sup> For the moist as "nourishment" of the hot, cf. e.g. 2.42.6-8 and 2.47.2-6.

<sup>42</sup> Thus foods are more or less nourishing, depending upon the presence of the moist; cf. 2.42.6-8 and 16-17. On the diachoretic property of foods, cf. 2.45.31-36 and the explanation given in note 48 below. For an explanation of stronger or lighter foods, cf. note 45 below.

<sup>43</sup> 2.56.8 ff.

<sup>44</sup> The effects of fire on foods are explained in 2.56.21 ff.: roasted foods are more *stasima* than raw foods because the moist, juicy, and fatter properties are removed by the fire. Thus coming into the belly, such foods draw to themselves the moisture from the belly, burn the mouths of the veins, and by "drying and heating" constrict the passages of the moisture.

<sup>45</sup> To these instructions the author adds in 2.56.27 ff.: Foods originating in dry and burning lands without water are all drier and hotter and furnish more strength

it is added, should be determined with reference to the directions already stated.

Such instructions as these are predicated upon knowledge of the active properties of foods, and this is what is now stated in summary form.<sup>46</sup> Sweet foods or acrid or salt or bitter or sour or "fleshy"<sup>47</sup> are all by their nature such as to heat, both those that are dry and those that are moist. Of these as many as have within themselves a larger part (*meros*) of the dry, heat and dry, while those that have a larger portion of the moist, heat, moisten, and are more diachoretic<sup>48</sup> than those which are dry. But all foods which heat and dry, producing no fluids or moisture in the body, dry the body for this reason: the body, becoming heated, is emptied (*kenoutai*) of the moist, some of it consumed by the foods themselves, some for nourishment of the "heat of the soul" and some, being warmed and thinned, is extruded through the skin. Then the author continues with an explanation of the two basic physiological processes of *kenôsis* and *plerôsis*. Sweets or fats or oily foods are filling (*plerôtika*) because, being heated and diffused, they expand and increase the hot in the body. But acid, acrid, sour, bitter, rough or dry foods do not fill up the body because they open and purge the mouths of the "veins"; these properties, some by contracting, some by drying, some by biting, cause the moist in the flesh to condense into a small mass, thus producing a great void (*kenon*) in the body. These summary statements, though not exhaustive, contain the most important principles of the activity of the *dynameis* within the body as they show also the attempt to connect physiological processes with the natural action of the *dynameis*.<sup>49</sup>

to the body (because they are heavier and denser) than foods from wet and cold lands, whose foods are colder, lighter and moister. Hence one must know the properties of the several foods themselves and also the *dynameis* of the *patris* from which the foods originate. In regimen the physician must use foods from dry and waterless lands when stronger nourishment is required, and from wet lands when lighter, moister nourishment is needed.

<sup>46</sup> 2.56.43 ff.

<sup>47</sup> *ta sarkôdea* as compared with the moisture or juice contained in foods; cf. e.g. 2.45.31 ff.

<sup>48</sup> Because, as it is explained (2.56.49 ff.), the moist foods, by giving more nourishment to the body and thus producing an *antispasin* into the belly, are moistened and readily pass.

<sup>49</sup> A few additional effects of foods are mentioned. Cf. especially 2.56.77 ff. where it is said that foods cooked in sauce are burning and moist because of the various dissimilar *dynameis* mingled together.

In addition to knowledge of the properties of foods and drink, comprehension of the effects of man's bodily exertion and exercise (*ponos*) is necessary in maintaining health.<sup>50</sup> For food and exercise, though they have *dynamēis* that are opposed (*hypenantias*) to each other, agree with each other (*sympherontai*) for health: it is the nature of exercise<sup>51</sup> ἀναλῶσαι τὰ ὑπάρχοντα and for food and drink ἐκπληρῶσαι τὰ κενωθέντα. The physician then must be able to distinguish the properties of both the natural and violent (*diabiēs*) exertions of the body and must know which exercises provide increase (*auxēsis*) and which diminution (*elleipsis*) for the flesh. It is this aspect of the *technē* of medicine that is next elaborated. But before treating the properties of exercises proper, the author analyzes the effects upon the body of various practices and habits of life: baths, oilings, vomitings, sleep and its lack, habits of meals,<sup>52</sup> etc. In all these *epitēdeumata* an explanation is advanced depending upon the hot and the dry, the cold and the moist, and their action within the body. Of the exercises proper, those which are classified as *kata physin* are first briefly treated: namely, sight, hearing, thought (*merimna*) and voice.<sup>53</sup> The explanation of the *dynamis* of each of these is essentially the same: the *psychē*, being moved by its activity, is warmed and dried; thus the moisture of the body is consumed and emptied out and the flesh reduced.

In the detailed analysis of the exercises proper (*diabiēs*) and their varying conditions and effects,<sup>54</sup> the *dynamēis* of the several forms of *peripatoi* are first treated. The examination of the *peripatos* after dinner is the most circumstantial. This exercise dries the belly and the body and does not allow the stomach to become fat, because the body and its foods are heated when the man is moved. The flesh therefore attracts the moisture in the body and does not allow it to collect around the belly; the flesh then is filled with the moisture and the belly grows thin. The body dries because, when it is moved and warmed, the *leptotaton* of the nourishment is

<sup>50</sup> 1.2.18 ff. *Ponos* includes the idea of all bodily exertions as well as the more limited sense of "exercise" with which, however, the *technē* of the author is especially concerned.

<sup>51</sup> The underlying conception is that of *kenōsis* and *plerōsis* of the body, and both are understood basically in terms of the *dynamēis*.

<sup>52</sup> 2.57–60. Thus, e.g., the salt bath heats and dries because, being by nature hot, it draws the moist from the body (2.57.3).

<sup>53</sup> 2.61.

<sup>54</sup> 2.62–65.

consumed, in part by the *symphyton thermon*,<sup>55</sup> in part removed from the body by the *pneuma* and in part passing by urine. Thus the driest part of the foods is left behind so as to dry the belly and the flesh. Certain *dromoi*<sup>56</sup> on the other hand heat and dissolve the flesh and digest τῶν σίτων τὴν δύναμιν τὴν ἐν τῇ σαρκί, in this way making the body more slow and fat. Running in cloaks has the same *dynamis* but heats more swiftly and thus moistens the body more. The *diaulos*, because the exercise affects τοῖς εἰσω τῆς ψυχῆς μέρεσιν, draws the moist from the flesh and thus dries and thins the body. In wrestling<sup>57</sup> the flesh increases because it becomes hot and dry and therefore attracts to itself the nourishment through the passages. Throughout the discussion which is quite extensive and detailed, the properties of the several exercises are analyzed from the point of view of the hot and the dry, the cold and the moist in the body and the consequent physiological effects.<sup>58</sup>

In the second book of his treatise, as has been seen, the author has examined not only foods and drinks but also man's habits, exercises and bodily exertions as well as geographical and climatic factors. He has attempted to explain with considerable thoroughness the manner in which all these factors, external to man, affect his *physis*. This analysis and explanation is conceived throughout in terms of *dynamis* and is carried out consistently and logically with much attention to detail. Indeed the attempt is frequently made to describe with some fullness the physiological processes which result from the action of the *dynameis*. Thus the author's procedure in the second book of his treatise presupposes and is complementary to his usage of *dynamis* in his analysis and explanation of man's *physis* in the first book.

The concept of *dynamis* is, moreover, equally vital to the final principle of the author's conception of the *techné* of medicine, namely, the proportional balance or *symmetria* which must be maintained, if health is to be preserved, between the *physis* in itself and all external to the *physis* and affecting it. For, as he

<sup>55</sup> Cf. 2.62.23 ff. where it is said that the heat of the soul consumes the moisture for its nourishment.

<sup>56</sup> 2.63.

<sup>57</sup> 2.64.9 ff.

<sup>58</sup> This is the ground also for the author's remarkable analysis of the *dynameis* of the several *eide* of pains (*kopón*) which arise in the body from physical exertion (2.66), as well as the *dynamis* of the therapy suggested (2.66.78 ff.).

asserts in his introductory exposition of his *techné*,<sup>59</sup> the physician must know and distinguish not merely the *dynamis* of foods and bodily exertions. He must also undertake to know τὰς συμμετρίας τῶν πόνων πρὸς τὸ πλῆθος τῶν σίτων as well as to the *physis* of man, the ages of the body, the seasons of the year, the changes of the winds, the situations of various lands and the constitutions of the year. And, as the author adds, expressing his conception in its broadest compass:

ἄστρον τε ἐπιτολὰς καὶ δύσιας γινώσκειν δεῖ, ὅπως ἐπίστηται τὰς μεταβολὰς καὶ ὑπερβολὰς φυλάσσειν καὶ σίτων καὶ ποτῶν καὶ πνευμάτων καὶ τοῦ ὅλου κόσμου, ἐξ ὧν περ τοῖσιν ἀνθρώποισι αἱ νοῦσοί εἰσιν.

The *symmetria* that is here envisaged as necessary for health, that is to say, depends for its determination upon knowledge by the physician of the *dynamis* of a large number of variable forces and factors, as well as upon knowledge of man's *physis* and of his food and drink. It is in terms of the concept of *dynamis*, therefore, that the author understands and establishes *symmetria* as the ultimate and operative principle of his theory of health and disease. This principle becomes the basis for the application of his medical theory to the practice of regimen, even though an inescapable limitation in actual practice must be pointed out<sup>60</sup>: it is impossible for σίτου μέτρον καὶ πόνων ἀριθμὸς σύμμετρος μὴ ἔχων ὑπερβολὴν μήτε ἐπὶ τὸ πλεόν μήτε ἐπὶ τὸ ἔλασσον to be discovered and established which will apply generally to the *physis* of each and every individual because of the great number of individual and variable factors involved. In consequence an absolutely accurate regimen for health for all men cannot be determined.<sup>61</sup> Despite this limitation the principle of *symmetria* is the basis upon which the author conceives and introduces his distinctive εὐρημα in medicine—*prodiagnōsis* of illness before it arises.<sup>62</sup>

These conceptions are discussed further at the beginning of the

<sup>59</sup> 1.2.29 ff.

<sup>60</sup> 1.2.40 ff.

<sup>61</sup> Stressing the individuality of the variable factors, the author remarks further (1.2.45 ff.) that exact *symmetria* could be achieved only if the physician could be present to examine the condition and observe the exercise of each patient individually, so as to determine the excess or deficiency of food or exercise.

<sup>62</sup> 1.2.57–69. As the author emphasizes, *prodiagnōsis* is both possible and necessary because illnesses do not arise suddenly but κατὰ μικρὸν συλλεγόμεναι ἀθρόως ἐκφαίνονται. This thought is often reflected and exemplified in the later treatment of regimen.

third book of the work, in which the author undertakes to translate his medical theory into the concrete doctrine of his *technê*. Here he reaffirms with emphasis that the individuality and variability of the *physis* of man, of his food and drink, and of all the factors upon which health depends render it impossible to prescribe with absolute precision a regimen for all men by means of which *symmetria* may be maintained. Then he turns to a fuller explanation of his "discovery" and to its application in regimen.<sup>63</sup> His own distinctive procedure in regimen embraces *prodiagnôsis* of the symptoms (*tekmêria*) which are manifested in the body before illness actually occurs, and *diagnôsis* of the condition of the body causing the symptoms, that is, of the power or strength in the body of the foods and of bodily exertions, relative to each other and to other factors. For it is from the excessive power and action of the one or the other in the body that illness arises, ἀπὸ δὲ τοῦ ἰσάζειν πρὸς ἄλληλα ὑγείη πρόσεστιν.<sup>64</sup> It is on the grounds of this "discovery" that the author, after first describing in rather general terms a regimen for the mass of men (whose necessities of life preclude constant attention to health), proceeds to analyze in very considerable detail the various conditions and their symptoms which forecast illness, along with prescriptions of regimens for cure of the conditions and prevention of illness, by restoration of *symmetria*. All the doctrine and the detailed treatment of regimen in this book rely basically upon this principle and constantly reflect the conception of *dynamis* enunciated in the earlier part of the treatise.

The significant function of the concept of *dynamis* in the method and thought of *De victu* thus becomes clearly apparent when it is realized that *dynamis* is the basis of the interpretation not only of every aspect of man's *physis* but also of all external to the *physis* and affecting it. The concept is indispensable then to the theoretical foundations which are elaborated in the first two books of the treatise; equally it underlies the medical doctrine articulated in the third book, for the author's explanation of *symmetria* and of *prodiagnôsis* and his application of them to regimen and treatment are fully intelligible only in the light of his earlier use of *dynamis* in the development of his theory. This fact, moreover, as well as

<sup>63</sup> 3.67.17 ff. and 3.69 ff.

<sup>64</sup> 3.69.19 ff. The analysis of the various *eidea* of the body, before disease attacks the body, then occupies the remainder of the book (3.70 ff.).



the character of the author's utilization of the concept has some bearing on two problems relating to *De victu*, the nature of its composition and the question of its dating.<sup>65</sup> For not only is *dynamis* the essential concept of the work; beginning with his basic hypothesis concerning *physis*, the author has also utilized the concept very consistently and deliberately in constructing an exhaustive and systematic explanation of the nature of man, of all that affects man and of all aspects of his *technê*, even his own "discovery." This fundamental and comprehensive employment of *dynamis* reveals in the composition of the work an integrity and genuine unity generated by its rationale. Nor is this unity seriously vitiated by the influence of earlier thinkers upon the author or by the possible use by the author of material derived from other sources.<sup>66</sup>

Further, the theory of *dynamis* as elaborated in the treatise contains, I think, some implications as to its dating. In general the author handles the concept in a self-conscious and rigorous manner, most obviously illustrated in his polemic against earlier physicians whose treatment of the *dynamis* of foods he considers mistaken in principle.<sup>67</sup> His own view, stated in conscious opposition and then applied concretely in his analysis of foods, displays the considerable independence and originality which are evident in much of his treatment of the concept. Moreover, his broadening of the scope and function of *dynamis* and especially his extension of it to the explanation of the effects of bodily exertions

<sup>65</sup> The latest discussion of some aspects of these problems is that of H. Diller, "Der innere Zusammenhang der hippokratischen Schrift *De victu*," *Hermes* 97 (1959) 39-56. Characterizing the composition of the work, considered formally, as that of an "einheitliches Ganzes," he gives a résumé of scholarly attitudes toward the problem of unity and analyzes (41-45) the author's methodical development of his basic hypothesis in the first two books (cf. also J.-H. Kuehn, *System- und Methodenprobleme im Corpus Hippocraticum*, *Hermes*, Einzelschriften 11 [1956] 75 ff., on the author's systematic procedure). Diller discusses at some length the composition of the latter portion of the author's treatment of his *heurêma* in book three, the use of dreams in book four, and the "digression" on the analogy of the *technai* and *physis* in 1.11-24. He detects in the composition of these passages some anomalies which he attributes in part to the complexity of the phenomena being discussed, in part to the effects of extraneous influences or materials.

<sup>66</sup> Even the discussion of dreams in the fourth book, although it may make use of extraneous materials, assumes a greater relevance to the earlier part of the treatise when it is seen as a further application of the author's *prodiagnôsis* to the *tekmêria* seen in dreams. Cf. Diller (above, note 65) 47-50 on the composition of the fourth book.

<sup>67</sup> Cf. 2.39. In connection with this the author's remarks on his predecessors in 1.1-2 are worth recalling.

and exercises seem peculiar to his own thought. This is equally true of the frequent attempts to offer extended and precise physiological explanations of the action of the *dynameis*. These several aspects of the author's handling of *dynamis*, in conjunction with the comprehensive and systematic usage of the concept as the basis of his thought, reveal a later and more advanced stage in the growth of the conception of *dynamis*. This development of the concept is perceived with considerable clarity when the complex treatment in *De victu* is contrasted with the simpler and more restricted usage of the concept found in most of the works of the Hippocratic *Corpus*, including even the important theory so vigorously defended in *De prisca medicina*.<sup>68</sup> Considered in its entirety, the use of *dynamis* in *De victu* would seem most consistent with a dating of the treatise within the first half of the fourth century B.C.<sup>69</sup>

<sup>68</sup> Cf. the survey of the usage in the *Corpus* given by Souilh  (above, note 6) 31–57. On *dynamis* in *De prisca medicina*, cf. my paper in *TAPA* 83 (1952) 184 ff. This treatise must still be dated about the end of the fifth century B.C. Cf. Kuehn (above, note 65) 46–56 in opposition to the later dating urged by H. Diller, “Hippokratische Medizin und attische Philosophie,” *Hermes* 80 (1952) 385 ff.

<sup>69</sup> It should be added that the usage in *De victu* does not show any influence of the distinctively Aristotelian conception of *dynamis*.