

# 1

---

## The Meaning of *Peri Phuseōs*

### PROLOGUE

There is no doubt the Greek notion of *phusis* (usually translated as nature from the latin *natura*), has been decisive both for the early history of philosophy and for its subsequent development. In fact, it is often said the Greeks discovered “nature.” But what did the earliest philosophers actually have in mind when they spoke of *phusis*? There is a great deal of discussion on the subject. In this opening chapter, this question begins with a linguistical analysis of the word, then examines the first (and only) occurrence of the word in Homer, the first use of the term by a pre-Socratic, and finally examines in detail the use of the term in the famous expression (and possible book title), *peri phuseōs*. The aim here is to help us understand not only what the earliest thinkers understood by *phusis*, but also how they conceived nature and why they developed the distinctive cosmologies we are familiar with.

### **The Etymology of *Phusis***

In ancient Greek, an action noun and its result can be derived from every type of verb by means of the suffix *-sis* (Holt 1941, 46). According to Benveniste (1948, 80), the general meaning of words ending in *-sis* is “the abstract notion of the process conceived as an objective realization,” that is to say “one expresses by *-sis* the notion as being outside the subject, and in this sense objective and established as accomplished from the fact that it is objective” (1948, 85). In other words, contrary to action nouns ending in *-tus*, when the

word ending in *-tus* always refers to the same subject as the verbal form (i.e., *pausethai mnēstuos*, “to cease courting”), nouns ending in *-sis* are in syntactic liaison with transitive/factive or operative verbs (to make, to place, etc.). The verb takes the word ending in *-sis* for its object. Thus, the verb indicates (Benveniste 1948, 82) “the concrete actualization of the notion conceived on the noetic plan as effective and objective” (i.e., *dote brōsin*: to give something to eat; or *zētēsīn poieisthai*: to realize an inquiry). As an action noun ending in *-sis*, Benveniste defines *phusis* as the (completed) realization of a becoming—that is to say, the nature [of a thing] as it is realized, with all its properties.<sup>1</sup>

Since the root holds a precise meaning, it logically suffices to find the root of the verb stem, from which the term *phusis* is derived, to discover its precise meaning. *Phusis* is derived from the verb *phuō-phuomai*. In ancient Greek, the *phuō* family has a number of particular characteristics. While it is easier to analyze the formation of the present starting from the Indo-European root *\*bhū-*, everything happens as if the group *phuō-phuomai* were derived from the root *\*bhū-*. Indeed, the nominal *phusis* as well as the present *phuō-phuomai*, has a short *ū*, while the root, *\*bhū-\***bhū-*, has a long *ū*. The reason for the supposition that *\*bhū-* is the original root is because the primary meaning of the ancient root *\*bhū-* is to grow, to produce, to develop (Chantraine 1968–80, 4:123). Just as in the active transitive, *phuō* has the meaning “to grow, to produce, to bring forth, to beget”<sup>2</sup> and, in the middle passive and intransitive forms of *phuomai*, the meaning “to grow, to spring up, to come into being, to grow on, to attach to.” Moreover, Homeric Greek knows no other meanings than “to grow, to produce,” (in particular, in the context of vegetation), and in addition, these meanings are the only ones found in a number of other Indo-European languages besides Greek: in Armenian *busanim*, “I grow,” *boys*, “plant”; in Albanian *bīin*, “to germinate,” *bimë*, “plant;” not to mention the Slavic languages, which have representatives of a *bhū-lo-* meaning “plant.” (Burger 1925,1; Chantraine 1968–80, 4:123). Again, although the group composed of the old aorist *ephun* (skr. *abūt*) and the perfect *pephuka* (skr. *babhūva*) evolved and took on the meaning of “becoming”—such that the root could be employed to complete the system of *\*a, es-*, “to exist, to be”<sup>3</sup>—its etymological meaning of “growth” still persists in Homer.<sup>4</sup>

If one considers that all the compounds of the term *phusis*<sup>5</sup> and its corresponding verb *phuō-phuomai* conserve the primary meaning of “growth, growing” throughout antiquity (and, in particular, in the context of vegetation), then it seems clear the fundamental and etymological meaning of the term *phusis* is that of growth, even if the meaning of the term evolved.<sup>6</sup> It therefore follows from a linguistic analysis of the word that, as an action noun ending in *-sis*, *phusis* means the whole process of growth of a thing from birth to maturity.

### ***Phusis in the Odyssey***

In book 10 of the *Odyssey*, the wily hero Odysseus relates the adventures of his wanderings to the Phaeacians, an idealized human community. However, Odysseus' adventures have nothing to do with the heroic antagonists of the *Iliad* but rather with giants, witches, sea-monsters, and the like—supernatural beings which inhabit the world of the irrational and the magical. Odysseus begins his tale by describing how he just barely escaped from the island of the Laestrygonians with his own ship and comrades while the other eleven ships in the fleet were destroyed and their crews killed and devoured by man-eating giants. He then finds himself and his crew on the island of Aeaëa, the isle of the fair-tressed goddess Circe, aunt of the infamous enchantress Medea and of the Minotaur, daughter of Helios and Perse and granddaughter of Oceanus, one of the primordial entities in Greek cosmogonical myth.<sup>7</sup> Circe is a witch who turns people into animals—a widely diffused theme in folktales—and this is the initial fate of several of Odysseus' comrades. While on a reconnaissance mission, they arrive at Circe's enchanted palace in a forest. They are invited in and offered a potion mixed with what is described as “baneful drugs” (*pharmaka lugra*, 10.236). They drink the potion and forget their native land. Subsequently, they are struck with a *rhabdos* (10.238) or “magic wand” and turned into swine—although they retain their wits (*nous*, 10.240).

Upon hearing of their disappearance but not yet aware of their fate, Odysseus sets out in pursuit of his companions. While heading up the road, he is stopped by the god Hermes who instructs him in all of Circe's “deadly wiles” (*olophōia dēnea*, 289). The god tells Odysseus what he must do when Circe tries to bewitch him. Hermes gives Odysseus a plant, a *pharmakon esthlon* (10.287; 292) or “effective drug” which will prevent him from being transformed into a pig (10.287–92). The plant is an effective antidote to Circe's *pharmakon lugron*.<sup>8</sup> It stops change and provides protection against Circe's powers (10.287–92). But for the plant to work, Odysseus must in some sense understand its *phusis*. Thus, after drawing the *pharmakon* from the ground and giving it to Odysseus, Hermes proceeds to show/explain/reveal its *phusis* to him: *kai moi phusin autou edeixe* (10. 303). The plant is described as having a black root and a white flower (304). Moreover, it is said to be called *mōlu* or *moly* by the gods and is hard to dig (305) albeit not for gods for whom all things are possible (306). This is the one and only occurrence of the word *phusis* in the Homeric corpus. Indeed, it is the first occurrence of the term prior to its use by a pre-Socratic philosopher.

At first glance, the term *phusis* seems to be employed synonymously with *eidōs*, *morphē*, or *phuē* (all of which are found in Homer), insofar as the moly plant is identified by its form.<sup>9</sup> It seems Homer could have written *kai moi eidōs (morphē; phuē) autou edeixe*. However, that Homer does not employ

the terms *eidōs*, *morphē* or *phūē* suggests the possibility that the term *phusis* means something quite different from “form” or “exterior aspect.” As already indicated, Emile Benveniste, as part of his analysis of nouns in *-sis*, suggests that in its appearance in Homer *phusis* can be defined as “the (completed) realization of a becoming” and thus as “the nature [of the thing] as it is realized, with all its properties.”<sup>10</sup> In other words, while *eidōs*, *morphē* and *phūē* designate the form or the physical constitution of a thing, *phusis* designates the process by which the object becomes what it is.

Many commentators claim Hermes only shows the natural form of the plant to Odysseus and there is no reference to growth or process in this example.<sup>11</sup> However, as Alfred Heubeck correctly notes, “*deiknunai* may mean not only showing something visible, but also giving instruction.”<sup>12</sup> It is quite possible, then, that Hermes explains—and must explain—the whole *phusis* of the potent herb (*pharmakon*) to Odysseus in order to save him from Circe’s spells. This would mean Hermes reveals both the external (black root,<sup>13</sup> milk white flower, etc.) and internal (that is, hidden) properties of the plant to Odysseus, even though Homer only explicitly refers to the external properties (10.287–92). This notion of hiddenness will be fundamental to Heraclitus’ idea of *phusis*.<sup>14</sup> Meanwhile, since the moly plant is characterized as a “divine” plant and thus revealed in “divine” language,<sup>15</sup> there is no reason why Hermes, who possesses such knowledge, would not have explained the divine origin (that is, origin myth) of the plant in order to enable Odysseus to understand how and why it acquired its current powers.<sup>16</sup> After all, the gods generally do things and/or create things for a reason, and the secret is only revealed when the origin of the thing is known.<sup>17</sup> Moreover, this understanding of what Hermes says to Odysseus corresponds with Benveniste’s etymological analysis. In order to be able to ward off magic, Odysseus needs more than simple possession of the moly plant when he confronts Circe.<sup>18</sup> To make use of the plant’s magical power, it is likely Odysseus must understand why the gods created it, an understanding that requires that he comprehend its *phusis*—that is, the whole process of the growth of the moly plant from beginning to end.<sup>19</sup>

### The First Pre-Socratic Occurrence of *Phusis*

Is there a relation between the etymology and the proposed Homeric meaning of the term *phusis* and the way it is used by the pre-Socratics? In my view, there is real semantic continuity here. Consider the first appearance of the term in a pre-Socratic work. Heraclitus states that although men do not or will not understand what his words reveal he will nonetheless engage in “distinguishing each thing according to its nature (*phusis*) and explaining how it is” (*kata phusin diaireōn hekaston kai phazōn hokōs echei*, DK22B1). In this

fragment, the fundamental meaning of *phusis*—the nature of a thing as it is realized with all of its properties from beginning to end, or the whole process of growth of a thing from birth to maturity—is not in doubt.

Heraclitus states that to explain or reveal (*phrazein*)<sup>20</sup> the present state of a thing (perhaps to name it correctly!) requires an analysis of the nature (*phusis*) of the thing, that is, an analysis of how it originated and developed.<sup>21</sup> As Kahn notes, “This expression of Heraclitus suggests that, in contemporary prose, the term *phusis* had become specialized to indicate the *essential character* of a thing *as well as* [my italics] the process by which it arose.”<sup>22</sup> In sum, to know the real constitution of a thing (what makes it behave and appear as it does) entails a knowledge of the processes that regulate its nature, and these processes are the same processes that were behind the origin of the present order of things.<sup>23</sup> In the final analysis, if Heraclitus wanted to accent the structure of the thing, he could have employed either the word *logos* or the word *kosmos*, that is, “distinguish each thing according to its *logos* or *kosmos*.”<sup>24</sup>

*Phusis* must be understood dynamically as the real constitution of a thing as it is realized from beginning to end with all of its properties. This is the meaning one finds nearly every time the term *phusis* is employed in the writings of the pre-Socratics.<sup>25</sup> It is never employed in the sense of something static, although the accent may be on either the *phusis* as origin, the *phusis* as process, or the *phusis* as result. All three, of course, are comprised in the original meaning of the word *phusis*.

### **The Comprehensive Meaning of *Phusis*.**

Although *phusis* is absent from the writings of early Ionians, that is, the first philosophic writings, it is unanimously accepted today, as it was in antiquity, that the concept of *phusis* was a creation of Ionian science. It was a creation to the extent the word permitted the Ionians to present a new conception of the world in which natural causes were substituted for mythical ones.<sup>26</sup> However, scholars are far from unanimous on what the pre-Socratics, beginning with the early Ionians, really understood by this term in a comprehensive sense, that is, as it must be understood in the expression *historia peri phuseōs*: an investigation into the nature of things. Indeed, some argue that although the early Ionians may be said to have invented the concept of nature (*phusis*), they had no single word for nature, that is, nature as an “all-inclusive system ordered by immanent law.”<sup>27</sup> In my view, the early Ionians did indeed have a comprehensive vision of nature and this vision was reflected in the term *phusis*. In fact, a comprehensive vision of nature is not incompatible with the Homeric notion of the word *phusis* although this does not suggest that Homer in any way invented, influenced, or even understood the meaning *phusis* was

later to take. What matters is that already in Homer, *phusis* designates the whole process of growth of a thing from its birth to its maturity.

Before examining the meaning of the term *phusis* in the expression *historia peri phuseōs*, something must be said about the expression *Peri phuseōs* as the title of a work.

### ***Peri Phuseōs* as the Title of a Work**

Although it is clear that the title *Peri phuseōs* was employed indiscriminately by writers of the Alexandrian period to characterise the works of almost all the pre-Socratics beginning with the early Ionians, that is, the Milesians, contemporary scholars disagree on precisely when a title was, in fact, first employed by a pre-Socratic. While no one argues Milesians themselves actually employed the title *Peri phuseōs*, Heidel (1910, 81) contends that “philosophical works were familiarly quoted as bearing the title *Peri phuseōs* sometimes *before* [my italics] the close of the fifth century.” West (1971, 9) appears no less convinced. According to him, instead of “*Hērakleitōs Blosōnos Ephesios tade legei: tou de logou eontos aiei ktl.*,” a text of Heraclitus would have started with: “*HĒRAKLEITOU PERI PHUSEŌS. tou de logou toude ktl.*” This also appears to be Burnet’s position when he states that the ancient philosophers themselves did not use titles (I assume, as we now employ them), but that the name of the writer and the title of the text composed the first sentence of the work, as one can observe in the work of Herodotus.<sup>28</sup> Guthrie (1971, 194), for his part, claims it is safe to say Parmenides employed this title.<sup>29</sup> Guthrie bases his contention on Gorgias’ parody of the title, *On Nature*, with his own title: *On the Non-existent or on Nature (Peri tou mē ontos ē Peri phuseōs)*. Others, such as Verdenius (1947, 272) and Kahn (1960/1993, 6n2), cite the Hippocratic treatise *On Ancient Medicine 20 (Empedoklēs ē alloi hoi peri phuseōs gegraphasin)* to support their claim that a title was employed at least from the time of Empedocles (that is, from the middle of the fifth century).<sup>30</sup> Others, such as Leisegang (*RE* 20–1, 1135) and Schmalzriedt (1970), appear to contend that the use of the title began later, in the fifth century.<sup>31</sup> Finally, there are some such as Lloyd (1979, 34 n119) and Huffmann (1993, 93–96) who appear noncommittal although they do not appear to contest that the pre-Socratics wrote about the nature of things (*peri phuseōs*).

In the final analysis, it is not important where the title was placed, or if there even was a title, since the vast majority of commentators, both ancient and modern, concur that the primary goal of the written works of the pre-Socratics was to provide a *historia peri phuseōs*. What is important is (1) who was the first author to write his opinions *peri phuseōs* and thus to initiate and

endorse the new scientific tradition and (2) what the famous expressions *peri phuseōs* and *historia peri phuseōs* mean in this context. On the first point, I concur with Kahn (1960/1993, 7) that it was undoubtedly Anaximander of Miletus, “It was he who first wrote down his views *peri phuseōs*, and thereby established a new literary form—the first in which prose was employed—which was to serve as the written basis for the new scientific tradition.”<sup>32</sup> In what follows, I focus on the second point, that is, to determine just what the pre-Socratics understood by the word *phusis*, particularly in the expressions *peri phuseōs* and *historia peri phuseōs*.

### **Interpretations of the Meaning of *Phusis* in the Expression *Peri Phuseōs***

In the main there are four different interpretations of what the pre-Socratic physicists understood by the term *phusis* in the expression *peri phuseōs* or *historia peri phuseōs*. These interpret *phusis*:

1. in the sense of primordial matter
2. in the sense of process
3. in the sense of primordial matter and process
4. in the sense of the origin, process and result.<sup>33</sup>

### ***Phusis* in the Sense of Primordial Matter**

The first interpretation was proposed by John Burnet. According to Burnet (1945, 10–11; see also 1914, 21), from the outset *phusis* meant the permanent and primary substance out of which something was made and the early Ionians were seeking the one *phusis* of all things.<sup>34</sup> Consequently, the expression *peri phuseōs* could be translated as “concerning the primary substance.” The notion of becoming (or process) inherent to the substance is secondary for Burnet. He bases his interpretation on a passage from Plato and on another passage from Aristotle. According to Burnet, both employ *phusis* in the sense of “primordial substance” when discussing ancient philosophy (Burnet, 1930/1945, 11n.11).

The passage from Plato to which Burnet refers is found at *Laws*10.892c2: *phusin boulontai legein tēn peri ta prōta*. For Burnet, the word *genesis* in this passage signifies: *to ex hou*, “that from which.” This also appears to be A.E. Taylor’s interpretation.<sup>35</sup> He translates this passage in his edition of the *Laws*: “by nature they mean what was there to begin with.” Now in *Laws* 10.891c2–3, Plato explicitly states atheistic materialists understand by nature (*phusis*) the four primary elements (earth, air, fire, and water) of all things (*tōn*

*prōtōn*).<sup>36</sup> This statement may have been behind Burnet's and Taylor's interpretation of *Laws* 10.892c2. However, Plato understands by *genesis* (and thus *phusis*) here the "productive force" connected with the first elements (that is, what commands or directs them). He wants to show that if the universe were generated (as the materialists affirm), then it was *psuchē* (or soul) rather than the four inanimate elements that initiated the process. Therefore *psuchē* has more of a right to be called *phusis*. The soul commands and the body obeys.

The text from Aristotle is found in *Physics* 2.193a21: *Dioper hoi men pur, hoi de gēn, hoi d'aera phasin, hoi de hudōr, hoi d'enia toutōn, hoi de panta tauta tēn phusin einai tēn tōn ontōn*. "And this is why some have said that it was earth that constituted the nature of things, some fire, some air, some water, and some several and some all of these elemental substances." Nevertheless, it is not a secret to anyone that Aristotle interpreted the Milesians from the point of view of his own theory of four causes: material, efficient, formal, and final.<sup>37</sup> That is why Aristotle remarks in the *Metaphysics*, when he is searching for the predecessors of the material principal or cause, "Most of the first to philosophize [or the earliest philosophers] were concerned with only the material principles of all things." (*Tōn de prōtōn philosophēsantōn hoi pleistoi tas en hulēs eidei monas oīēthēsan archas einai pantōn: Meta.* 1. 983 b 7–9). This is strange if one considers that what immediately follows this sentence defines this cause, or material principal, both as the constituent principle and the primary "generator."<sup>38</sup>

### ***Phusis* in the Sense of Process**

The second interpretation of the meaning of *phusis* belongs to O. Gigon (1935, 101) who argues, "Ich möchte *phusis* im primitivsten Sinn (Synonym mit *genesis*) verstehen und interpretieren." In this interpretation, pre-Socratics put the emphasis on the process, and its the primordial substance which becomes secondary.

The position that *genesis* is a synonym for *phusis* is not without foundation even if the two terms are derived from different roots. Indeed, this is not the crux of the problem, since no one would deny that the notion of growth for the Greeks implied both life and motion. The problem is rather the following: whatever the importance given to the notion of process (including "growth" in the sense of a principle or law intrinsic to nature), it cannot be understood to mean an absolute principle or *archē*—which was fundamental for the pre-Socratics.<sup>39</sup>

Furthermore, since the notion of *phusis* as process can be understood in the sense of the law or principle intrinsic to the idea of nature, that is, as designating what is responsible for the behaviour of such and such a thing, R.G.



Collingwood (1945, 43) can be included as adhering to this interpretation when he writes: “Nature, for them [the Ionian philosophers], never meant the world or the things which go to make up the world, but something inhering in these things which made them behave as they did.”

### ***Phusis* in the Sense of Primordial Matter and Process**

The third interpretation is upheld by W. Jaeger (1947, 20).<sup>40</sup> Jaeger finds support for his thesis, at least in part, from the study of two passages of Homer’s *Iliad* where it is said Ocean is the genesis of all gods and of all things: *Ōkeanon te, theōn genesin* (*Iliad* 14.201); and *Ōkeanou, hospes genesis pantessi tetuktai* (*Iliad* 14. 246). In these passages, according to Jaeger, *genesis* encompasses the same double meaning as *phusis*, and, as a result, “To say Ocean is the *genesis* of everything is virtually the same as calling it the *phusis* of everything” (Jaeger 1947, 20).

What he understands by this double meaning is, on the one hand, “the process of growth and emergence” and on the other, “that from which they (*ta onta*) have grown, and from which their growth is constantly renewed,” in other words, its source or origin.

The interpretation of L. Lachier (1972, 667) blends well with Jaeger’s when he writes, “le sens fondamental [of the word *phusis*] est l’idée d’une existence qui se produit ou du moins se détermine elle-même, en tout ou en partie, sans avoir besoin d’une cause étrangère.”<sup>41</sup>

Now both Lachier and Jaeger are correct if *phusis* is understood as a synonym of the verb *phuomai* (to begin to grow) and if we agree with the old adage that it is inconceivable something can come from nothing. In this way, the double meaning is possible. Nevertheless, in the passages of Homer cited above, *genesis* implies a meaning Jaeger seems to have missed, namely, the “result” of this “productive power.” Indeed, as Benveniste (1948, 76) correctly notes, Ocean gave birth to all beings, that is, to “a completed, accomplished ‘birth’” (“une ‘naissance’ effective, réalisée”). From this perspective, the word *genesis* would cover the same triple meaning as the word *phusis* in Homer’s works.

Jaeger also states *genesis* is a synonym of *phusis*. However, since the term *phusis* is absent from the first philosophical writings, how can it be argued with any certainty that *phusis* is synonymous with *genesis*? The answer is found in Aristotle’s *Metaphysics* (1.983b7–984a4), where these same passages of Homer are quoted precisely to explain what certain writers (in particular, Plato) believe—namely, that “by having presented Ocean and Tethys as authors of the world’s generation” (*Ōkeanon te gar kai Tēthon epoiēsan tēs geneseōs pateras*), Homer shares Thales’ opinion on what constitutes *phusis*. The fact Aristotle does

not agree with them is of little importance here. What is important is that certain authors argue that for both Homer and Thales, water is equivalent to the term *phusis* insofar as it is the principle (*archē*) or the first cause (*prōtē aitia*) of all things, and it is this element which generated the completed realities (*onta*).

### ***Phusis* in the Sense of Origin, Process, and Result**

According to the fourth interpretation, which is that of Heidel, Kahn and Barnes as well as my own,<sup>42</sup> the term *phusis* in the expression *peri phuseōs* or *historia peri phuseōs* comprises three things: (1) the absolute *archē*, that is, the element or cause that is both the primary constituent and the primary generator of all things; (2) the process of growth strictly speaking; and (3) the outcome, product, or result of this process. In brief, it means the whole process of the growth of a thing, from its birth or commencement, to its maturity. More precisely, the term *phusis*, in the expression *peri phuseōs* or *historia peri phuseōs*, refers, at a minimum, to the origin and the growth of the universe from beginning to end. Indeed, the pre-Socratics, with whom this expression originated, were interested (at least initially) in a cosmogony in the literal sense of the word. They were not interested in a description of the universe as it is but in a history of the universe; in an explanation of its origin (*phusis* as absolute *archē*), of the stages of its evolution (*phusis* as process of growth), and finally of its result, the *kosmos* as we know it (*phusis* as the result).

In this regard, it is interesting to note such a cosmogony involves not one, but two departure points: a chronological and a logical. The chronological or temporal starting point is called chaos in the modern sense of the term: to wit, the state of confusion existing before creation. The logical starting point, on the other hand, is the *kosmos* itself, that is, the natural world conceived as a structured whole in which each constituent part has a place. Indeed, people have always sought to know how the present order of things originated from the primordial chaos.<sup>43</sup>

Presently, I would like to examine three series of texts which, in my view, demonstrate (1) this notion of *phusis*; (2) the relation between this notion and the method in vogue with the pre-Socratics; and (3) the relation between the generation of the *kosmos* and the expression *peri phuseōs* or *historia peri phuseōs*.

### **Several Concrete Examples Illustrating Such a Notion**

An example which provides a good illustration of the first notion is found in Hippocratic works which focus on embryology. In order to treat the problem

of generation, the author calls upon either empirical research, or analogies, or both. Thus, in the treatise *The Seed*, which forms a whole with the treatise *The Nature of the Child*, the author begins by informing us that the sperm (or seed)<sup>44</sup> comes from the entire body (ch. 1) of each parent (chap. 6–8),<sup>45</sup> after which he describes the evolution of the child’s body inside its mother’s womb. Chapters 22–27 contain a long digression where the author establishes an analogy between the growth of plants and the growth of embryos such that the womb (*mētra*) is to the embryo (*embruon*) what the earth (*gē*) is to the plant (*phumenon*) that lives in it. He concludes: “if you review what I have said, you will find that from beginning to end (*ex archēs es telos*) the process of growth (*tēn phusin*) in plants and in humans is exactly the same.” (trans. I.M. Lonie)

In chapter 29, the author explains that his method is based both on the observation of facts and on analogy

If you take twenty or more eggs and place them to hatch under two or more fowls, and on each day, starting from the second right up until the day on which the egg is hatched, you take one egg, break it open and examine it, you will find that everything is as I described it—making allowance of course for the degree to which one can compare the growth of a chicken (*ornithos phusin*) to that of a human being (*anthrōpou phusei*.)” In sum, “you will find that the growth of the infant (*tēn phusin tou paidiou*) is from the beginning to the end (*mechris es telos*) exactly as I have described it in my discourse.

The meaning of the expressions *ex archēs es telos* and *mechris es telos* are clear. When it comes to enquiring into the *phusis* of something, it is the whole process from beginning to end which is understood. In the case of the embryo, the author is not concerned with “the way it is” but “how did it come into existence” and “of what basic elements is it composed.” This explains Aristotle’s pertinent remark with respect to his predecessors; to wit: they enquired into “how each being naturally came to exist rather than how it is” (*pōs hekaston gignesthai pephuke mallon hē pōs estin*).<sup>46</sup> Indeed, what counts for Aristotle is not the unformed embryo but the *ousia* or essence of a thing “for the genesis is for the sake of the essence (*ousia*), not the essence (*ousia*) for the sake of the genesis” (*Parts of Animals* 1.640 a 18–19). This is why he criticizes Empedocles directly after this passage because Empedocles argues that the characteristics proper to each animal are the result of accidental events, which occurred during their development. For Empedocles, the essence or form is not in the beginning, as it is for Aristotle. Indeed, for both Hippocratic physicians and pre-Socratic philosophers the process is something real, that is, it has a real history and is defined in relation to its material source. For Aristotle, it is a simple circular process in which the end of a cycle

is the beginning of another cycle. The reason for this is that once a being is born it must create a being similar to itself to participate in the eternal and the divine as much as possible.<sup>47</sup>

### Notion and Method in Vogue with the Pre-Socratics

To define the relation between the notion of *phusis* and the method in vogue with the pre-Socratics, it is necessary to examine the texts which deal with the relation between medicine and the philosophy of nature. Medicine studies the composition of the body to better analyze the causes of sickness and their remedies. Since the composition of the body is contiguous with the problem of growth, this in turn raises those of generation and of production. Considering the period in question it is not surprising the primary concerns of the physicians overlapped those of the physicists. On the one hand, both claim the *phusis* of man and the *phusis* of the *kosmos* are the same. On the other hand, both look for the causes of life and death and by extension of health and sickness.<sup>48</sup> Of course, physicians and philosophers did not all agree on the relation itself, and the controversy that it generated in the Hippocratic camp provides valuable insights into the methods in vogue with the pre-Socratics as well as clarifications on the meaning of *historia peri phuseōs*.

Consider the two following texts, which illustrate what we have just said. The first text is from the author of *Regimen I*, who writes:

I maintain that he who intends to write correctly concerning the regimen of man must first know and discern the nature of man in general (*pantos phusin anthrōpou*), that is know from what things he is originally composed (*gnōnai men apo tinōn sunesthēken ex archēs*), and discern by what parts he is controlled (*diagōnai de hupo tinōn mereōn kekratētai*) for if he does not know that primary constitution (*tēn ex archēs suntastin*), he will be incapable of knowing their results (*ta hup' ekeinōn gignomena*), and if he does not discern what dominates in the body, he will be incapable of providing the patient with a treatment. (*Regimen I.2.1*)

Later the author adds that the physician should also know what occurs in the whole universe (*holos kosmos*) such as the seasons of the year, the changes in the winds, and even the rising and setting of the stars in order to guard against the changes and excesses from which diseases come to men (*Regimen I.2.2*).<sup>49</sup>

The second text is from the author of the *Ancient Medicine* who supports the antithesis of this:

I think I have discussed this subject sufficiently, but there are some physicians and philosophers<sup>50</sup> who maintain that no one can understand the sci-

ence of medicine unless he knows what man is (*hoti estin anthrōpos*); that anyone who proposes to treat men for their illnesses must first learn of such things. Their discourse then tends to philosophy as may be seen in such writings of Empedocles and all others who have ever written about nature (*peri phusios*); they discuss the origins of man (*ex archēs hoti estin anthrōpos*), how he was initially formed (*kai hopōs egeneto prōton*) and of what elements he was constituted (*ka hoppothen sunepagē*). It is my opinion that all which has been written by physicians and philosophers on nature (*peri phusios*) has more to do with painting than medicine. I do not believe that any clear knowledge of nature (*peri phusios*) can be obtained from any source other than a study of medicine and then only through a thorough mastery of the science.<sup>51</sup> (trans. J. Chadwick and W.N. Mann with minor changes)

Let's examine the two texts more closely while placing them in the context of their respective treatise. The first text claims the principles of medicine are subject to an investigation of nature in general (*peri phuseōs historia*). In sum, its author argues that to treat effectively the regimen of man, a knowledge of the nature (*phusis*) of man in general is necessary. This entails two things: (1) a knowledge of the fundamental constituents from which man was composed at creation, in order to know of their effects; (2) a discernment of the elements which predominate in order to furnish an effective treatment to the patient.

As such, the author of *Regimen I* claims first that the constituents of all things, including man, are water and fire (I.3.4); and second that the structure of the body is composed in such a way that it imitates the structure of the universe: "fire structured everything (*panta diakosmēsato*) in the body the way it is, to make it an imitation of the universe (*apomimēsīn tou holou*), matching the little organs with the large and the large with the small." (I.10.1)<sup>52</sup> This remark comes after the author has described the formation of the human foetus, which he sees as similar to the structure of the universe. In fact, an interest in embryology can be discerned among all the philosophers to whom this author frequently alludes.<sup>53</sup>

The relation between embryology and cosmogony is certainly not new. According to the doxographical tradition, Anaximander seems to have conceived his cosmogony along similar lines when he makes an analogy between the seed of animals and the development of the embryo—albeit his description is purely natural. This is also the case for certain Pythagorean authors, which is not surprising if one considers the meaning and importance of the term *kosmos* in their philosophy (see Huffman 1993, 97–99; 219–220). In fact, the mythical image of a universal egg from which the world emerged establishes to what degree such a notion could be primitive. As G. E. R. Lloyd (1966, 176) so aptly demonstrates, reasoning by analogy, which consists of concluding from the existence of certain resemblances observed between two

objects the existence of other resemblances, is a mode of reasoning that, in a certain manner, is common to all people regardless of the period.

According to the author of the treatise *Regimen I*, an anthropology entails an anthropogony, just as a cosmology entails a cosmogony. Since the anthropogony is (to a certain degree) the completion of the cosmogony it is reasonable to assume a cosmogony is equally part of the curriculum as we shall see with the treatise, *On Fleashes (Peri sarkōn)*. The reason the author of *Regimen I* wants to know the fundamental constituents from which the *phusis* of man and the universe are made implies a form of mysticism common to all people since the beginning of time. If one knows the primordial state of things, it is possible to penetrate their secrets.<sup>54</sup> This is one of the reasons behind theogonical and cosmogonical myths; they serve to justify the present order of things.

As for the capacity to discern the elements that predominate, and in order to furnish an effective treatment (according to the author), of the two elements our body is composed of, fire always has the power (*dunamis*) to move everything, whereas water always has the power (*dunamis*) to nourish everything (I.3.1). In turn, each one dominates and is dominated although neither ever gains complete control (I.3.1–3). Moreover, each of these two elements is composed of two attributes. Fire is composed of hot and dry, and water of cold and wet. But each element also has an attribute of the other; fire has the attribute of wetness and water has the attribute of dryness. In this way, an element is never locked in the same state and many substances become possible (I.4.1).

Since the human body is composed of a mixture of several types of fire and of water, health and sickness must therefore exist in relation to certain mixtures. Thus, the most healthy constitution is a composition of a mixture of the lightest water and the most subtle fire whatever our age or the season of the year. This is obviously not the case for the other mixtures and consequently precautions with respect to age and season must be taken into account. The author of *Regimen I* understands this by discerning elements that predominate in order to furnish an effective treatment (*Regimen I*.32.6).

The author of *Ancient Medicine*, on the other hand, is radically opposed to the use of the philosopher's method for medical ends. This text not only provides important information with regard to the method and content of *peri phuseōs* writings, but it clarifies the other position.

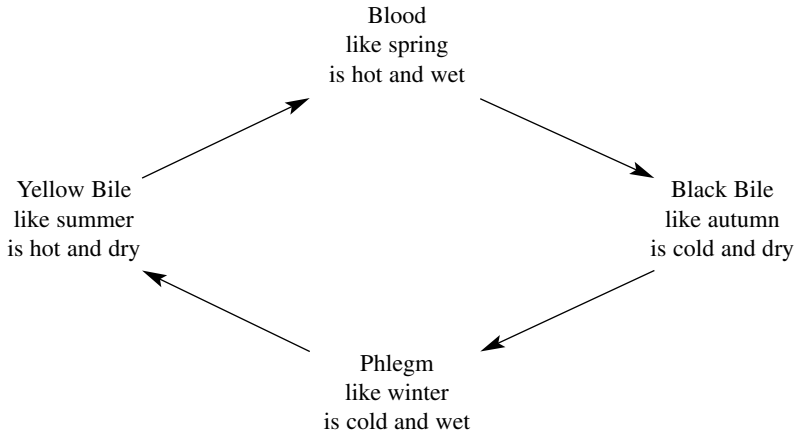
At the beginning of the treatise, *Ancient Medicine*, the author states that medicine, unlike disciplines that study celestial and terrestrial phenomena (*peri tōn meteōron ē tōn hupo gēn*), is not based on postulates or hypotheses (*hupothemēnoi*)<sup>55</sup> since it has a real departure point (*archē*) and method (*hodos*). The departure point are the discoveries (*ta heurēmēna*) made over the centuries and the method is that of observation.<sup>56</sup> As such, medicine is an art

(*technē*) whose primary preoccupation is the treatment of diseases and whose discoveries are the results of real investigations (ch. 2).

What are these *hupothenenoi*? The hypotheses in question are unverifiable postulates; what occurs *peri tōn meteōron ē tōn hupo gēn* are nothing more than speculations and without any real value for the author of this treatise. In sum, contrary to his colleague, neither the seasons of the year, nor the changes in the winds, nor the rising and setting of the stars would have influenced the treatment of this physician. This is also the case for the origin and the formation of man, that is, an anthropogony. The aim of this evolutionary description is to explain the causes behind man's continual existence. We are told this approach is that of Empedocles and the other physicists who wrote works of the *peri phuseōs* type and which were so in vogue among his colleagues. However, the hostility of this author necessitates a closer examination of the influence of Empedocles on the methods of certain physicians.<sup>57</sup>

Empedocles was the first to introduce the doctrine of the four elements (fire, water, air, and earth), or the theory according to which none of the four elements has priority over the others. Each element is an *archē* in the philosophical sense of the term. The influence of this doctrine is particularly important to the author of the treatise, *The Nature of Man*. Like most of his contemporaries, he rejected all the physical and physiological theories which were based on a single element for generation. It would be impossible, he argues, if it originated from a single substance (ch.1–3). The physical bodies, the author continues, are constituted of four substances, namely hot, cold, dry, and wet. Like Empedocles, he contends none of the substances have priority over another. Moreover, each of the substances is considered a power (or *dunamis*) and when these powers are in harmony, each thing (in the present case the human body), has its proper form. This reminds one of his predecessor, Alcmaeon of Croton, for whom health is the result of the balance (*isonomia*) and proportionate mixture (*krasis*) of the powers (*duamis*), which according to a general law, are opposed pair to pair (wet and dry, hot and cold, bitter and sweet), whereas sickness is the supremacy (*monarchia*) of one of the terms of such a couple.<sup>58</sup> Moreover, once the body dies, each of these substances must return to its proper original nature: the hot with the hot, the cold with the cold, the dry with the dry, the wet with the wet (ch.3).

The body can be seen as a composite of the four humours: blood, phlegm, yellow bile, and black bile, the balance or imbalance of which is responsible for health or sickness respectively (ch.4). There is similar correlation between the four primary opposites (hot, cold, wet, and dry), the four humours and the four seasons. Each of the four humours is associated with one of the four seasons and two of the primary opposites, with each group predominating in turn (ch. 7). This can be schematized as follows:



This excessively systematic and speculative theory appears to find support in certain empirical evidence. For example, when it states that “the quantity of phlegm in the body increases in winter because it is the bodily substance most in keeping with the winter, seeing that it is coldest. You can verify its coldness by touching phlegm, bile and blood; you will find that phlegm is the coldest.” (*The Nature of Man* 7). Nevertheless, the author of the treatise, *Ancient Medicine*, attacks the theory for its lack of an empirical foundation (just as he castigates the theories of Empedocles). Indeed, his theory, just like that of Empedocles, remains essentially speculative and for this reason the author of *Ancient Medicine* challenges, from the outset, anyone who attempts to treat diseases not from empirical investigations (that is, from reality), but from hypotheses that simply reduce every cause of disease to the four primary opposites: hot, cold, dry, and wet. In chapter 15 he continues, “I am utterly at a loss to know how those who prefer these hypothetical arguments and reduce the science to a simple matter of ‘postulates’ ever cure anyone on the basis of their assumptions. I do not think that they have ever discovered (*xeurēmenon*) anything that is purely hot or cold, dry or wet, without it sharing some other qualities (*allōi eidei*).”

In fact, if the constitution of man was so simple, he tells us in chapter 20, an edible like cheese, so harmful for one person, must be harmful for all others. But this is evidently not the case. In this regard, he estimates that the first inventors (*hoi prōtoi heurontes*) were much closer to reality both in method and reason: “they never imagined that it was heat or cold, or wetness or dryness, which either harmed a man or was necessary to his health. They attributed disease to some factor (*dunamei*) stronger and more powerful than the human body which the body could not master. It was such factors that they sought to remove.” (ch. 14).



For his part, he argues that the human body is much more complex:

There exists in man saltness, bitterness, sweetness, sharpness, astringency, flabbiness, and countless other qualities (*dunameis*) having every kind of influence, number and strength. When these are properly mixed and compounded with one another, they can neither be observed nor are they harmful. But when one is separated out and stands alone it becomes both apparent and harmful. (ch. 14)

This last passage merits attention for two reasons. First, although the author of the treatise, *Ancient Medicine*, severely criticizes the doctrine of the four elements and their derivatives as a base for medicine because they employ postulates he considers as arbitrary, the fact remains that his own assumptions (albeit more numerous) are no less hypothetical. More important, what we see here is, as Lloyd notes, “a growing interest not just of medical, but of general scientific, method.”<sup>59</sup> Second, this passage provides the occasion to open a digression on the term *dunamis*, which assuredly is one of the most important terms in the history of natural philosophy and a key to understanding the word *phusis*.

The term *dunamis*, the most general meaning of which is that of “power” is an action noun derived from the verb *dunamis* the fundamental meanings of which are “to be able, capable.” (Chantraine 1968–80, 1.300). The term itself envelops a capacity that is both active and passive. As an active “power” or “force,” *dunamis* is the capacity or aptitude to act or to give. As a passive “power” or “force,” *dunamis* is the capacity or aptitude to be acted upon or to receive. Thus, as a body or substance composed of both active and passive properties, it is capable of causing or receiving certain modifications. Since it was the duty of the physician to find the substances capable of modifying our physical states, this explains why the word *dunamis* was so frequently employed by the Hippocratic physicians. The technical or special meaning that the term *dunamis* had for Hippocratic doctors and was so influential in Greek philosophy is excellently summarized by J. Souilhé following his analysis of the use of the term *dunamis* by the author of the treatise *Ancient Medicine*:

The term *dunamis* comprises two ideas which are mutually complementary. The substances manifest themselves by their qualities. Things are rendered sensible by these properties, such as the cold, the hot, the bitter, the salt . . . , which enable them to enter into relation with other bodies. These are the *dunameis*, distinct entities which constitute the exteriorization of the substance. But these entities themselves can only be known when in action: action is their *raison d'être*, and action characterises and individualises them. The cold differs from the hot or the bitter or the salt because

it produces a particular determined effect. It can be combined with the other qualities, but will not be confound with them, because its action is not identical to theirs. And this action of qualities is once again their *dunamis*. The term thus designates both their essence and their proper manner of manifesting themselves. (Souilhé 1919, 36)<sup>60</sup>

Later, when Souilhé terminates the group of Hippocratic treatises, he observes that in the treatises where the influence of cosmological ideas is evident:

the term *dunamis* designates the characteristic property of bodies, their exterior and sensible appearance, which permits their determination and specification. Thanks to *dunamis*, the mysterious *phusis*, the substantial *eidōs* or primordial element, makes itself known by its action. This explains why it was later possible to pass from the known to the unknown, from appearance to reality, and how easy it was to establish a perfect equation between *phusis* and *dunamis*.<sup>61</sup> To state the nature of a thing or its property becomes the same since the two are inseparable and united by a genuine causal link. (Souilhé 1919, 36)

The terms *phusis* and *dunamis* are sometimes almost synonymous, but there is normally a perceptible distinction as illustrated in the following passage from Menon's *Iatrica*:

Philistion maintains that we are composed of four forms (*ek d'ideōn*), that is to say, of four elements (*ek de stoicheiōn*): fire, air, water, earth. Each of these has its *dunamis* [the quality which characterizes it and makes it known]: fire has the hot, air the cold, water the wet, and earth the dry.

J. Souilhé next demonstrates how the Sophists adopted and transposed this terminology, and finally facilitated its introduction into philosophy. Thus, for Plato, *dunamis* can be defined as the property or the quality, which reveals the nature of a thing. The *dunamis* enables us to give a name to each thing that conforms to its constitution, and to place things in separate groups (Souilhé 1919, 149). Indeed, if the *phusis* designates the substantial foundation of a thing, it is thanks to its *dunamis* that this thing can reveal itself to us. This important relationship will resurface again further on, but now we turn to the third and final series of texts, which should clarify the meaning and scope of the term *phusis* in the expression *historia peri phuseōs*.

### **The Real Meaning of *Peri Phuseōs***

What follows are five texts, which show that what pre-Socratics understood by the expression *historia peri phuseōs* was a true history of the universe from its

origins to the present. This history most certainly includes the origin of mankind. However, I will conjecture with the fifth text that it is probably that the logical starting point was the form of the society in which the philosopher resided. Thus, *historia peri phuseōs* could mean an investigation into the origin and development of the contemporary world (including the society in which the philosopher resided) from beginning to end. Let us examine these texts.

### EURIPIDES: FRAGMENT 910 (NAUCK)<sup>62</sup>

The first text is taken from Euripides' famous fragment 910:

Blessed is he who has devoted his life to scientific research (*tēs historias*); he will neither malign nor harm his fellow citizens, but observing the ageless order of immortal nature, will enquire from what source it was composed and in what way (*all'athanatou kathorōn phuseōs kosmon agērōn, † pē te sunesthē chō pēi chō pōs*). Such men would never take part in shameful deeds.<sup>63</sup>

In this fragment, we see that Euripides holds in high regard a certain type of doctrine or physical philosophy (probably that of Anaxagoras),<sup>64</sup> namely, the study or contemplation of “the ageless order of immortal nature, whence and how it was composed (or constituted).” Admittedly, the expression *peri phuseōs* is absent, but the term *historia*, in conjunction with lines five to seven (the italicized Greek) suggests this expression is to be understood. Meanwhile, several observations are in order. The expression, *kathorōn kosmon agērōn*, indicates that what is observed is the present *kosmos*. That is to say, the world that surrounds the observer, while that of *pē te sunesthē chō pēi chō pōs* (a corruption of *pēi te sunesthē kai hopēi kai hopōs*?) signifies this *kosmos* had a beginning and underwent a process of evolution. In this regard, we note that the verb most frequently associated with the nominal *kosmos* is *sunistēmi*, to compose, to put together (Kahn 1960/1993, 223). Moreover, the adjectives employed to describe *kosmos* and *phusis* are the same as those that appear in Homer's works (in the form of formulas) to describe the gods and their attributes. Thus, in *Odyssey* 5.218, Calypso is said to be *athanatos kai agērōs*, as is the famous aegis of Athena in *Iliad* 2.447.<sup>65</sup> These are also terms that Anaximander appears to have applied to his *archē*.<sup>66</sup>

### HIPPOCRATIC TREATISE *ON FLESHES* 1.2

The second text is found in the Hippocratic treatise *Peri sarkōn* (*On Fleashes*), which the author could very well have entitled *Peri archōn*.<sup>67</sup> This text can

clarify what may have been understood in the preceding text. The author strongly states that in order to compose a medical treatise, he will use the common opinions (*koinēisi gnōmēisi*) of his predecessors as the starting point. These common opinions are provided in the form of a cosmogony and anthropogony respectively:

I need only speak of celestial matters (*peri de tōn meterōn*) for as much as it is necessary to show, with respect to mankind and other living things, how they developed and formed (*hopōs ephu kai egeneto*), what is soul; what is health and disease; what is good and evil in man, and for what reason he dies.

Next, he keeps his promise in describing his cosmogony as follows: (1) In the beginning, all things were in a state of confusion (*hote etarachthē panta*); (2) then, the elements from which all things are composed, separated in three stages to form the universe: aether, air, earth; (3) finally, the formation of the parts of the body began, emanating from the putrefactions caused by the heat left in the earth after its initial formation.

This text could not be clearer. It exemplifies without equivocation the common assumption at the time among the *phusiologoi*. According to this assumption, the constitution of all living things is analogous to that of the universe insofar as they originated from the same primordial stuff and are part of the same *kosmos*. There is doxographical evidence for this assumption in *all* of the pre-Socratics beginning with the early Ionians.<sup>68</sup> Moreover, it is obvious the expression *peri tōn meterōn* can be substituted for *peri tēs phuseōs*. I will return to this observation later.

#### XENOPHON: *MEMORABILIA* 1.1.11–15

The third text is taken from the famous passage in Xenophon's *Memorabilia*, where Socrates, the founder of the teleological method, fails to understand the procedure of the physicists:

He [Socrates] did not even discourse, as so many others, about the nature of all things (*peri tēs tōn pantōn phuseōs*), or how, what the physicists call the *kosmos*, came into existence (*hopōs kosmos ephu*), or by which necessary causes the heavenly phenomena occur (*tisin anankais hekasta ggnetai tōn ouraniōn*). Indeed, he showed the folly of those who dealt with such problems. . . . Moreover, in their disturbing research into the nature of all things (*peri tēs tōn pantōn phuseōs*), some hold that there is only one substance, others that there are an infinite number: some that all things are in perpetual motion, others that nothing can ever be moved at any time: some that all life

is birth and decay, others that nothing can ever be born or ever die. Nor were these the only questions he asked about such theorists. Students of human nature, he said, think that they will apply their knowledge in due course for the good of themselves and any others they choose. Do those who pry into heavenly phenomena (*ta theia*) imagine that, once they have discovered the laws by which these are produced (*hais anankais hekasta gignetai*), they will create at their will winds, waters, seasons and such things to their need? Or have they no such expectation, and are they satisfied with knowing the causes of these various phenomena? (trans. Marchant with major revisions)

This text includes several new elements for our thesis. First, not only does the expression *peri phuseōs* appear twice (with explicit allusions, moreover, to the Milesians, Diogenes of Apollonia, Anaxagoras, Democritus, Heraclitus, Parmenides, and Empedocles), but the expression is found each time with its natural genitive: *tōn pantōn*. Indeed, there is always *phusis* of something and when it is a question of the pre-Socratic physicists or *phusikoi*, *hopōs kosmos ephu* refers not only to the origin and evolution of the universe and mankind, but equally to the causes through which phenomena (*ta ourania*, that is, *ta meteōra*) continue to occur. I stress “continue to occur” for if there is indeed something that distinguishes speculative thought from mythical thought, it is the notion that the “natural” causes behind the initial formation of the universe continue to account for the current natural phenomena. Consequently, it is clear celestial and terrestrial phenomena (*ta meteōra kai ta hupo gēn*) are part of the *peri phuseōs* investigation. Indeed, in his *Meteorology* (which deals with what his predecessors called *meteōrologia*), Aristotle does not restrict himself to treating what falls under the term *ta meteōra* strictly speaking (wind, clouds, rain, lighting, thunder, etc.), but he considers springs, rivers, and even earthquakes (338a27). This explains the use of the expression *peri tōn meteōrōn ē tōn hupo gēn* at the beginning of the treatise *Ancient Medicine*. In fact, according to W. Capelle (1912, 414), meteorology did not originate as a distinct research subject, but as an alternative expression for *historia peri phuseōs*. This may explain the expression, *peri tōn meteōrōn*, instead of *peri tēs phuseōs* in the preceding text.

#### ARISTOTLE: *PARTS OF ANIMALS* 1.1. 640 B 4–22

The fourth text is taken from Aristotle’s *Parts of Animals*:

The ancient philosophers who first studied nature (*Hoi oun archaioi kai prōtoi philosophēsantes peri phuseōs*), investigated the material principle and cause (*peri tēs hulikēs archēs*) to understand its nature and properties; how the universe is generated from it (*pōs ek tautēs ginetai to holon*) and

under of influence of what motion (*tinōs kinountos*), whether, for instance, by strife or love or mind or chance, the substratum of matter (*tēs 'hupokeimenēs hulēs*) being assumed to have necessarily a certain kind of nature—fire, for instance, to have a hot nature, earth, a cold one; the former to be light, the latter heavy. This, indeed, is how they explain the genesis of the universe (*Houtōs gar kai ton kosmon gennōsin*).

To which Aristotle immediately adds: “And they explain the development of plants and animals in a similar way” (1.640b4–12).

This passage provides additional information on the subject of the expression *peri phuseōs*. First, it is now clear that for his predecessors the temporal and spatial starting point was a material cause or principal (*hē hulikē archē*) which also acted as the efficient or moving cause or principle. In *Generation of Animals* 5.778b7–10, Aristotle maintains the same discourse when he says the first physicists (*hoi d'archaioi phusiologoi*) did not clearly distinguish between material and efficient causes. Initially, he is alluding only to the Monists, but further on he explicitly mentions the efficient causes of Empedocles, Anaxagoras and Democritus.<sup>69</sup> The physicists, meanwhile, begin their investigation *peri phuseōs* by studying the material principal itself, that is, the nature and properties (*tis kai poia tis*) of the principle from which the whole developed. Indeed the expression *pōs ek tautēs ginetai to holon* is abundantly clear. *To holon* refers to the result. Therefore, the *historia* alludes to the entire development from beginning to end. Moreover, *to holon* concerns the completed whole; in brief, the universe (*kosmos*) in which nothing is lacking from its whole by nature (*holon phusei*).<sup>70</sup> That is the reason why he adds animals and plants at the end; they are included in the whole because they are part of the same *phusis* as that of the whole.

Finally, *ho kosmos* is not only synonymous with *to holon*, but also with the expression *hē tōn ontōn phusis* in *Metaphysics* 1.984 b 9. The importance of this resides in its location. Aristotle states that if Anaxagoras postulated *nous* as the separate cause of movement, it is precisely because the *onta* in question (the universe and its entire contents) exhibit goodness and beauty (984b11), and order and arrangement (984b17). This led him to investigate the principle of these things (*tōn ontōn*) that are the cause of their beauty (*tou kalōs tēn aitian archēn einai tōn ontōn ethesan*, 984b21–22). From this perspective, the starting point of an investigation of the *peri phuseōs* type is the present order of things.

#### PLATO: LAWS 10.889 A4–E2

The fifth and final text is taken from Book 10 of Plato's *Laws*. What we have here is the theory (*logos*) which the atheistic materialists were reputed to

have employed *peri phuseōs*.<sup>71</sup> This text does not only clearly illustrate the entire thesis for which I am arguing, but it also includes the term *technē*—the final link needed to interpret what the pre-Socratics characterized as a *historia peri phuseōs*.

The facts show—so they claim—that the greatest and finest things in the world are the products of nature and chance (*phusin kai tuchēn*), the creations of art (*technēn*) being comparatively trivial. The works of nature, they say, are grand and primary, and constitute a ready-made source for all the minor works constructed and fashioned by art—artefacts (*technika*), as they're generally called. . . . I'll put it more precisely. They maintain that fire, water, earth and air owe their existence to nature and chance (*phusei kai tuchēi*), and in no case to art (*technēi*). As for the bodies (*sōmata*) that come after these (*meta tauta*)—the earth, sun, moon and stars—they have been produced from these entirely inanimate substances (*dia toutōn gegonenai pantelōs ontōn apsuchōn*). These substances moved at random, each impelled by virtue of its own inherent properties (*tēs dunameōs hekasta hekastōn*), which depended on various suitable amalgamations of hot and cold, dry and wet, soft and hard, and all other haphazard combinations that inevitably resulted when the opposites were mixed (*tēi tōn enantiōn krasei*). This is the process to which all the heavens and everything that is in them owe their birth (*tautēi kai kata tauta houtōs gegennēkenai ton te ouranon holon kai panta hoposa kat'ouranon*), and the consequent establishment of the four seasons led to the appearance of all plants and living creatures. The cause of all this, they say, was neither intelligent planning (*ou dia noun*), nor a deity (*oude dia tina theon*), nor art (*oude de technēn*), but—as we have explained—nature and chance (*phusei kai tuchēi*). Art (*technēn*), the brain-child of these living creatures (*ek toutōn*), arose later, the mortal child of mortal beings (*autēn thnētēn ek thnētōn*); it has produced, at a later stage (*hustera*), various amusing trifles that are hardly real at all—mere insubstantial images of the same order as the arts themselves. (I mean for instance the productions of the arts of painting and music, and all their ancillary skills). But if there are in fact some techniques that produce worthwhile results, they are those that cooperate with nature, like medicine and farming and physical training. This school of thought maintains that government, in particular, has very little to do with nature, and it is largely a matter of art; similarly legislation is never a natural process but is based on technique, and its enactments are quite artificial. (trans. Saunders with minor revisions)

According to this theory, nature (*phusis*) is originally nothing other than the primordial matter (the four elements)—in sum, the temporal or chronological *archē*. As for chance (*tuchē*), it is employed, as in Plato's *Sophist* (265c), in the sense of a spontaneous causality (*aitia automatē*) as opposed to an intelligent causality (*aitia dianoētikē*). Indeed, according to this theory, nature generates everything through its own power. Moreover, when it is said

that such and such a stage of the evolution of the *kosmos* is due to the combination of nature and chance, this does not mean that these are external causes. Each stage is only a stage in their proper evolution. Finally, this theory (*logos*) is characterized as a *peri phuseōs* account at 891c8–9. Let us briefly examine the contents.

According to this theory, the *kosmos* appears in the following manner: the four elements which are due to nature and chance (in this case, the same thing), impelled by their respective tendencies (*dunameis*), generate the entire universe (*to holon*). Then the seasons originate from the movement of the celestial bodies. The effect of the seasons on the earth (this is still the result of nature and chance), then leads to the appearance of animals and plants. The greatest and finest works of this cosmogony are thus accomplished.

As for art (*technē*), it is not surprising that the theory argues that its creations are both minor and secondary. Since it is impossible to take into consideration creation *ex nihilo*, to create something that was not originally present is either the result of *phusis* (and consequently is itself *phusis*), or is the result of *technē* (see also Aristotle, *Physics* 3.203b6). However, *technē* always proceeds from what is already there, in this case, the works of nature. This explains why the creations of art are said to be minor and secondary. In my view, the term *technē* is central to the comprehension of the expression *historia peri phuseōs*.

The reason is that the word *technē* is synonymous with human progress which, in turn, is indissociable from the concept of a *Kulturentwicklungslehre* or theory of cultural evolution. Indeed, to query the origin of art is to query the origin of society, for it is inconceivable that society could evolve without *technē*. Thus in book 3 of *Laws*, which delineates the origin and history of constitutions, Plato states that he will describe the conditions from which the Athens of his time emerged (*ta nun gegonen hēmin sumpanta*, 678a8). He begins with a description of the first men. They are the survivors of one in a series of natural cataclysm (677a) that periodically destroy all but a remnant of mankind. They are portrayed as being ignorant of *technai* (*apeirous technōn*, 677b6). With the progress of time (*proiontos men tou chronou*), the inhabited world became what it is now (*ta nun katestēkota*, 678b6–8). The progress of time is thus indissociable from the discovery of diverse *technai*. And as to insist on this point, Plato employs the substantive *epidosis*, progress (676a5, 679b2)<sup>72</sup> and the verbs *heuriskō* and *aneuriskō*, to discover (677c6, c10) and *epinoeō*, invent (677b8).<sup>73</sup>

## CONCLUSION

In Homer, *phusis* designates the whole process of growth of a thing from its birth to its maturity. This is compatible with a linguistic analysis of the word



*phusis* which shows that the fundamental and etymological meaning of the term is that of “growth,” and that, as an action noun ending in *-sis*, it means “the (completed) realization of a becoming”—that is to say, “the nature of a thing as it is realized, with all its properties.” This characterization of *phusis* clearly corresponds with the attempt to describe the process through which the present world order comes about which we see expressed in the earliest philosophical cosmogonies. Indeed, the pre-Socratics were interested (at least initially) in a cosmogony in the literal sense of the word: they were not only interested in a description of the universe as it is, but in a history of the universe: an explanation of its origin (*phusis* as absolute *archē*), of the stages of its evolution (*phusis* as process of growth) and finally of its result, that is, the *kosmos* as we know it (*phusis* as the result). What differentiates the term in its pre-Socratic use from its Homeric ancestor is the reference to the gods. Within the context of the early history of philosophy the term *phusis*, with its primary meaning of growth, arose to express not merely the result of a process or the form of a thing but the process, from origin to end, through which all that is came into being and continues to behave as it does. A number of texts strongly suggest that the *phusis* of “all that is” refers not only to what we call cosmology, but also to the origins and development of human beings and their social organizations or politics. In the final analysis, this may very well be the general meaning of the expression *historia peri phuseōs*.