



The Greek Concept of Nature

GERARD NADDAF

The Greek Concept of Nature

SUNY series in Ancient Greek Philosophy

Anthony Preus, editor

The Greek Concept of Nature

Gerard Naddaf

State University of New York Press

Published by
State University of New York Press, Albany

© 2005 State University of New York

All rights reserved

Printed in the United States of America

No part of this book may be used or reproduced in any manner whatsoever without written permission. No part of this book may be stored in a retrieval system or transmitted in any form or by any means including electronic, electrostatic, magnetic tape, mechanical, photocopying, recording, or otherwise without the prior permission in writing of the publisher.

For information, address State University of New York Press,
90 State Street, Suite 700, Albany, NY 12207

Production by Michael Haggett
Marketing by Michael Campochiaro

Library of Congress Cataloging-in-Publication Data

Naddaf, Gerard, 1950–

The Greek concept of nature / Gerard Naddaf.

p. cm. — (SUNY series in ancient Greek philosophy)

Includes bibliographical references and index.

ISBN 0-7914-6373-7

1. Philosophy of nature—History. 2. Philosophy, Ancient. I. Title. II. Series.
B185.N325 2004
113'.0938—dc22

2004006772

10 9 8 7 6 5 4 3 2 1

For Emily and Alexander

This page intentionally left blank.

Contents

Preface	ix
Introduction	1
1 The Meaning of <i>Peri Phuseōs</i>	11
2 Cosmogonic Myth as an Antecedent to <i>Peri Phuseōs</i> Writings	37
3 Anaximander's <i>Historia Peri Phuseōs</i>	63
4 The <i>Historia Peri Phuseōs</i> from Xenophanes to the Atomists	113
Conclusion	163
Notes	167
Bibliography	221
Index of Concepts and Proper Names	237
Index of Classical Passages Cited	000

This page intentionally left blank.

Preface

In 1992, I published a book entitled: *L'origine et l'évolution du concept grec de "physis."* It met with a generally favorable reception among reviewers, and over the years, I received encouragement to produce an English edition of the work. It seems that the idea of nature in ancient Greece fascinates scholars in a variety of different fields.

While the present volume, *The Greek Concept of Nature*, retains the germ that initiated the 1992 work, it is not a simple translation of the earlier volume. There has been a considerable development. This is due primarily to further reflection on the subject—albeit also with the engagement with new scholarship. This development with new ideas will be even more evident in the two subsequent volumes: *Plato and the Peri Phuseōs Tradition* and *Living in Conformity with Nature*. The focus of the latter will be Aristotle and the Hellenistic Tradition, which was not initially treated in the 1992 work.

I would like to express my gratitude to Luc Brisson, Pierre Hadot, Robert Hahn, Pierre Pellegrin, Tony Preus, Tom Robinson, and the late Mathias Baltes and Trevor Saunders for their encouragement. I would also like to thank Benoît Castelnérac, Alex Livingston, and Richard Allen for their editorial assistance. And, of course, SUNY Press for their tolerance for my delinquent manuscript.

Translations from the Greek are my own unless otherwise indicated. After some reflection, I decided to employ transliterated Greek throughout, in place of Greek characters. I have transliterated the η and ω by \bar{e} and \bar{o} . The iota subscripts are indicated at the end of the long vowel, for example: ω gives $\bar{o}i$. In order to lighten the text, I have not reproduced the accents. In my view, this makes the work more accessible to an audience that includes readers who are not specialists in the field.

Finally, I would like to thank the Social Sciences and Humanities Research Council of Canada and York University for their generous support.

ABBREVIATIONS

- DK H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker*, 6th ed., Berlin: Weidmann, 1951.
- KRS G. S. Kirk, J. E. Raven, and M. Schofield, *The Presocratic Philosophers*, 2nd ed., Cambridge: Cambridge University Press, 1983.

Introduction

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 that the Greeks discovered “nature.” But what did the earliest philosophers actually have in mind when they spoke of *phusis*? There is a formidable amount of controversy on the subject. This investigation attempts to reconstruct from a historical perspective the origin and evolution of this concept.

The impetus behind this study (and the general thesis it proposes) originated many years ago in an analysis of book 10 of Plato’s *Laws*. In this work (which will be the subject of a separate volume), Plato criticizes those who wrote works in prose or in verse of the *peri phuseōs* type. Plato’s primary reproach is that the authors of these works never admitted the notion of intention (implied by *technē*) as the explanatory principle behind the order that governs the universe. This refusal, in Plato’s eyes, is at the basis of the “atheism” of his time. In order to understand the true meaning of the doctrine of Plato’s adversaries, I felt that it was necessary to reconstruct the entire movement of thought that led to the problem that Plato was attempting to resolve.

When one closely examines the contents of these works entitled *Peri phuseōs*, it is clear their primary aim is to explain how the *present* order of things was established. This, in fact, clearly follows from Plato’s own analysis in *Laws* 10. These works propose a theory to explain the origin (and development) of the world, humanity, and the city/society. The structure of these works (even before undertaking a linguistic analysis of the word *phusis*) leads one to conclude that for the first philosophers or pre-Socratics as we conventionally call them, the word *phusis* in this context means the origin and growth of the universe as a totality. And since humanity and the society in which they reside are also part of this totality explanations of the origin and development of humanity and society must necessarily follow an explanation of the world.

In *Laws* 10, Hesiod is also among the accused. The reason is that according to Hesiod’s account in the *Theogony*, the gods originate *after* the universe. More precisely, according to Hesiod’s theogonic account, gods are derived

from primordial entities (Chaos, Gaia, Eros, Tartaros, etc.), whereas for Plato, if one does not postulate a divinity present from the beginning and independent of the material on which it works, it is impossible to attribute the order that governs the universe to an intelligence.

When one closely analyses Hesiod's theogonic account, it is possible to discern the same three part schema that is discernable in the pre-Socratic accounts of the *peri phuseōs* type: namely a cosmogony, an anthropogony, and a politogony. In reality, this three part schema is intimately connected with the form of a cosmogonic myth which, in turn, is closely connected with the mythico-ritual scenario of the periodic renewal of the world. The aim is to provide an explanation for the *present* social and natural order and a guarantee that these orders will remain as they are. In fact, in a cosmogonical myth, both cosmic evolution and cosmic order are modeled on, and expressed in terms of, the socio-political structure or life of the community.

In a certain sense, this myth explains and guarantees a "way of life" for the social group. This brings us to another interesting feature of accounts of the *peri phuseōs* type. It is still somewhat commonplace to associate the pre-Socratic conception of philosophy with complete "disinterested" inquiry or speculation (evidenced somewhat in Aristotle's generic *phusiologoi* to qualify these individuals). But a keen interest in politics appears to have been the *norm* among these early philosophers. In fact, it is possible that their respective *historia* (investigation or inquiry) may have been politically motivated. The word *historia* and/or *phusis* or more precisely *historia peri phuseōs*, may have been the newly minted phraseology to express the new rational approach to a way of life in conformity with the new political realities and the new comprehensive view of how the world, man and society originated and developed.

There is, in fact, an interesting parallel and continuity between political engagement and cosmological theory and by extension a way of life in all the pre-Socratic *historia* of the *peri phuseōs* type and their mythical antecedents. However, our own investigation covers a wide framework and could also be considered as a more general history of early Greek philosophy. Indeed, there is a correlation between accounts of the *peri phuseōs* type and the word *philosophia* which may also have been newly minted. Thus according to Heraclitus (DK22B35) "lovers of wisdom ought very much to be inquirers into many things" (*chrē gar eu mala pollōn historas philosophous andras einai*),¹ and there is no doubt, as we will see, that the pre-Socratics investigated a wide range of *interrelated* things.²

If a detailed analysis of book 10 of Plato's *Laws* was the impetus behind this investigation, the method which guided it is grounded in a clarification of the word *phusis*. This linguistic analysis constitutes the departure point for all the subsequent research, historical, philosophical, spiritual, and even archeological. Here is a brief overview of what follows.

The primary aim of chapter 1 is to understand the general meaning of the word *phusis*. The chapter thus begins with a linguistic analysis of the word *phusis*. It follows from this analysis that the fundamental and etymological meaning of the term *phusis* is that of “growth” and as an action noun ending in *-sis*, *phusis* means the whole process of growth of a thing from birth to maturity. I then examine the one and only occurrence of the word in Homer which is not only compatible with this analysis, but the general context in which it appears, an analysis of the properties of a magical plant in an encounter between gods and humans, can also serve as an example (something scholars have failed to notice), for what one could (or should) expect to find in the prephilosophical/rational use of the word. When we turn to the first occurrence of the word in a pre-Socratic, Heraclitus DK22B1, it is clear that *phusis* means not only the *essential character* of a thing, but also how *a/the* thing originates and develops and thus continues to regulate its nature. In sum, *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 in fact is the meaning that one finds nearly every time that the term *phusis* is employed in the writings of the pre-Socratics. 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*.

Did the pre-Socratics beginning with the Ionians also understand *phusis* in a comprehensive sense, that is, to designate not just a particular thing, but *all* things? I argue that they did and this, in fact, is what must be understood by the expression *historia peri phuseōs*, that is, an investigation into the nature of things. There is, in fact, a good deal of consensus on this point. However, scholars diverge considerably on the meaning of *phusis* in the expression *historia peri phuseōs*. After an analysis of the expression *Peri phuseōs* as the title of a work, different scholarly interpretations of the word *phusis* in the expressions *peri phuseōs* and *historia peri phuseōs* are examined. There are, in the main, four different interpretations: (1) *phusis* in the sense of primordial matter; (2) *phusis* in the sense of process; (3) *phusis* in the sense of primordial matter and process; and (4) *phusis* in the sense of the origin, process, and result.

In light of the linguistic analysis of the word *phusis*, I argue for the fourth interpretation. In sum, the term *phusis*, in the comprehensive sense, refers to the origin and the growth of the universe from beginning to end. In conjunction with this, I examine three series of texts, including a number of Hippocratic medical 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*.

What follows from these texts is that the pre-Socratics understood by the expression, *historia peri phuseōs*, a true history of the universe, from its origins to the present, and this history certainly included the origin of mankind. However, I argue that the *historia* included more than this. In my view, the *historia* was about how the present order of things was established and thus included the origin and development of human culture and/or society. This is precisely what we find in Plato's detailed description of accounts of the *peri phuseōs* type in book 10 of the *Laws* which is included in these texts. Moreover, this is consistent with the general account and structure of cosmogonical myths. Their aim is also to explain how the present natural *and* social order emerged from beginning to end. This is subject of chapter 2.

In chapter 2, I begin with an analysis of myth and, in particular, a cosmogonic myth. A myth is considered to be a true story that relates *how* something real came into existence. Because myth wants to bring about the truth it proclaims, events that occurred *ab origine* are reenacted in ritual, that is, demonstrative acts that are perceived as having been performed at the beginning of time by gods or ancestors. This is also the case with the cosmogonic myth, providing both an explanation for the present social and natural order and a guarantee the present orders of nature and society will remain as they are. In a cosmogonical myth both cosmic evolution and cosmic order are modeled on and expressed in terms of the socio-political structure or life of the community. From this perspective, the society in which ancient humanity resides is the logical starting point. Thus, in order to explain how the present social order came into being, the cosmogonic myth must necessarily begin with the birth of the world (a cosmogony), then recount the birth of mankind (an anthropogony), and finally relate the birth of society (a sociogony or politogony). For ancient peoples, society comes into existence without a real past in the sense it only reflects the result of a series of events that took place *in illo tempore*, that is, before the "chronological" time of the people who narrate the myth.

I examine an excellent example of such a cosmogonic myth: the great creation epic, the *Enuma Elish*. This myth narrates how the sovereign god Marduk established the present order of things. The *Enuma Elish* begins with a description of the primordial reality (or chaos). It then describes the birth and evolution of the *present* order of things (natural and social), a universe that exhibits law and order. This is the result of a combat between Tiamat and Marduk, or more precisely, between two generations of gods representing disorder and order respectively. Following this, we can easily follow the birth of humankind (and its reason for being) and the type and structure of society in which humans will reside. The *Enuma Elish*, like all cosmogonic myths, which relate how the world was delivered from regression and chaos, was reiterated and re-actualized each year in the capital city during the New Year

festival. A series of rites re-actualized the battle which had taken place *in illo tempore* between Marduk (represented by the king) and Tiamat (the Dragon symbolizing the primordial ocean). The victory of god and his cosmogonic work assured once again the regularity of nature's rhythms and the good state of society in its entirety. The ceremony was attended by the social elite who renewed their oath of allegiance to the king, just as the gods swore an oath to Marduk when he was elected king. They would have listened with reverence to the sacred epic, and its recital and reenactment would have persuaded them how an "ideal state" should be organized and why their loyal support should be unequivocal.

Following this, I examine Hesiod's *Theogony* which is another prime example of a cosmogonical myth. The *Theogony*, a hymn in honor of Zeus, explains how the god, after a series of socio-political power struggles, defeats his enemies and dispenses, as the new ruler, privileges and obligations among the immortals, thus establishing and guaranteeing the permanence of the present order of things. I begin, however, with some important preliminary remarks including Hesiod as an historical figure, his relation with the alphabet, and, most important, how his reference to the Lelantine war reinforces the thesis that the *Theogony* is essentially "conservative," since it tends to praise and support the aristocracy—indeed, it gives the aristocracy a mythical justification, since it anchors the institution in a cosmogonical myth. I then analyze the overall structure of the *Theogony* beginning with the cosmogony strictly speaking and show how this myth has the same three part schema that one finds in the *Enuma Elish* creation story. In conjunction with this, I show that Hesiod's *Theogony* explains the origin of the organizational structure and code of values of the gods and by extension, the heroes and nobles of Hesiod's time.

I then show the most notable difference between the cosmogonic myth presented by Hesiod and that of the *Enuma Elish*: the absence of ritual. Indeed, even if Hesiod's *Theogony* offers an explanation of the origin and the evolution of the world and proposes an exemplary socio-political model of "existence" for mankind within the world order established by Zeus, what is striking about Hesiod's account is that, in it, the periodic renewal of the world, humanity, and society is no longer necessary. In fact, the manner in which the cosmogony is represented in Hesiod's *Theogony* strongly suggests that the renewal ritual no longer has a reason for being. A comparison of the roles played by Zeus and by Marduk in their respective cosmogonies clearly demonstrates this. Unlike Marduk, Zeus does not intervene in the natural order of things. He is simply at the origin of a new socio-political order. This may explain why Hesiod's theogonic text unfolds in a perfectly linear and irreversible way. Unlike Marduk, Zeus does not recreate what is already in place: the physical universe as we know it. I attribute this novelty in Hesiod

to the collapse of the Mycenaean civilization. There is no doubt, however, that Hesiod's *Theogony* would have been performed (and thus ritualized, so to speak) before an audience. Further, there is no doubt that it was addressed to an aristocratic elite and that it was meant to enhance, if anything, their value system: a Homeric and thus a conservative value system at least by the then current standards.

I then turn to the *Works and Days* which presents, in my view, a very different position. While it does contain several traditional myths that convey messages that the social group could have considered as having been transmitted by its ancestors, in many respects it is advocating a new type of social reform, a new type of general *aretē*. Indeed, in the *Works and Days*, Hesiod contests the Homeric conception of *aretē* and offers another in its place. No longer the possession of nobles and heroes, the *aretē*-norm now belongs to another class of men. The *panaristos*, the complete man, is the successful farmer, and *aretē* now signifies the qualities that enable a person to prosper and avoid famine.

In the *Works and Days* as in the *Theogony*, the kings are again at center stage; however, the description offered by Hesiod in the former is radically different from the latter. Hesiod directly challenges the kings of Thespies with an astonishing amount of free speech. In the *Works and Days*, the kings are unequivocally characterized as greedy and their verdicts as corrupt. In the *Theogony*, receiving gifts in exchange for delivering judgments is a right of a mediator or king, and Hesiod painted there a rather flattering picture of the custom. In the *Works and Days*, Hesiod is clearly vexed by the system of gifts. He doubts that the verdict or *dikē* will be straight, and he suggests that he has firsthand knowledge of this. In Hesiod's eyes, this system of justice must be replaced at any cost, for it clearly has a legal force. If one considers that the *Works and Days* unequivocally argues that the justice system of the *basileis* must be replaced with a more objective (if not codified) notion of justice (and since it must have been "performed" on a regular basis), it must have had a lasting and subversive effect on subsequent generations. From this perspective, Hesiod is certainly a catalyst for western political paideia; indeed, an advocate and initiator of a new revolutionary way of thinking which will influence political ideals and their corresponding cosmological models.

In chapter 3, I examine the first rational account of the *peri phuseōs* type, that of Anaximander of Miletus (610–546 BCE). In this chapter, I argue that the present order of things for Anaximander comprises not only the physical world strictly speaking but also the socio-political world in which the investigator/author resided. From this perspective, I concur somewhat with W. A. Heidel, for whom the aim of Anaximander's book *Peri phuseōs* was "to sketch the life-history of the cosmos from the moment of its emergence from infinitude to the author's own time." This is precisely what Hesiod is attempting to

do in the *Theogony*. He sought to explain how Zeus established the present order of things, natural and social. This is the aim of a cosmogonical myth in general, and Anaximander is clearly attempting to accomplish the same end. This is why he must begin with a cosmogony and then go on to an anthropogony and finally to a politogony. However, his approach, as I attempt to show, is radically different since his explanation is not only naturalistic, but he clearly and distinctly separates all three developments.

I begin my study of Anaximander's *historia* with an analysis of the origin and development of his cosmological model. This necessitates beginning with an analysis of his chronological starting point, that is, *phusis* as *archē*, and why he choose *to apeiron* to qualify this entity. I then examine his cosmogony, noting the similarities and differences with its mythical antecedents. The central idea is that the cosmos grows, like a living being, from a seed or germ. This germ contains the two primary opposites hot and cold. Once the separation of the mutually hostile opposites commences, the natural operation of their reciprocal power accounts for all natural change.

Following this I give a detailed examination of Anaximander's famous cosmological model which places an immobile earth at the *center* of a celestial sphere surrounded by three concentric rings which contain the heavenly bodies. The examination shows that Anaximander conceived his universe or cosmological model according to a mathematical or geometrical plan which reflects a propensity for both *geometrical* equality and symmetry following the series 3. Although this conclusion has been adopted by the vast majority of commentators there is considerable disagreement on the origin and significance of the numbers and consequently about the origin of the cosmological model. I examine the four main hypotheses: (1) the numbers are the result of a sacred or mythical inspiration; (2) the numbers are the result of an astronomical inspiration; (3) the numbers (at least the 3 to 1 ratio) are the result of an architectural or technical inspiration; and (4) the numbers are a result of a political inspiration. I attempt to show that the political hypothesis is the only valid one, but for reasons that had not been hitherto evoked. I argue that the numbers that translate the sizes and distances of the heavenly bodies in relation to the earth correspond in some way or other to the three social groups of which the *polis* of Anaximander's time was composed: the aristocracy, the (new) middle class and the peasantry (or poor). Anaximander's cosmological model reflects what he saw as the only possible way of ridding the *polis* of the political dissention of his time: *isonomia*. In the final analysis, what we have is a sort of reciprocal relation between the microcosm of the city and the macrocosm of the universe.

The explanation that Anaximander gives us of the origin of humanity and of the other living beings (not mentioned by the poets or in mythical accounts) is, as in the case of his cosmology, the first naturalistic explanation in this

domain. As one might expect, his explanation is entirely consistent with his cosmological system. Indeed, the same natural processes are at work. Living beings emerge from a sort of primeval moisture or slime which is activated by the heat of the sun after the initial formation of the universe. Based on the testimonia it seems safe to say that Anaximander argued that in the beginning members of the human species were born from a different animal species that was capable of nourishing them until such time as they could support themselves. Moreover, *man* no longer has the temporal and logical priority over *woman* that he possessed in the mythical accounts of the Greeks. Finally, since human beings have a real beginning in time, the origin of humanity and society are no longer represented as coeval; that is, human beings will no longer be seen as coming into existence within the context of a fully functioning society as it was the case in mythical accounts.

The most important obstacle we encounter in coming to terms with Anaximander's view on the origin and evolution of society is, of course, a lack of testimonia. Nonetheless, there is some non-Peripatetic doxographical evidence which is not contested by commentators. These attest to Anaximander as a mapmaker and geographer. I show that geography and history are, in fact, inseparable at this point in time. Indeed, according to Strabo they are both closely connected with politics and cosmology and he cites Anaximander on the authority of Eratosthenes as a prime example if not the initiator of this. I argue meanwhile that Anaximander was no armchair philosopher. He formulated his theory through investigation and discovery; he travelled extensively, notably to Egypt via Naucratis. In this regard, I attempt to show that Egypt, or, more precisely, the Nile Delta, was seen as the cradle of civilization and, in certain respects, as the center of the universe. I argue that there is a good deal of circumstantial evidence for this, but the argument must be read as a whole. Some of the evidence will corroborate Martin Bernal's claims regarding the relation between Greece and Egypt, albeit for different reasons. It is all part of what one author has called the Egyptian mirage in ancient Greece.

In chapter 4, I attempt to show that most of the pre-Socratics wrote a work of the *peri phuseōs* type and that their respective *historia* followed the same three part schema that one finds in Anaximander and the cosmogonical myths that preceded him. I examine them in more or less the conventional chronological order: Xenophanes, Pythagoras and the Pythagoreans, Heraclitus, Parmenides, Empedocles, Anaxagoras and the Atomists: Leucippus and Democritus. In each instance, I begin with a synopsis of the historical and political milieu in which the philosopher resided. I attempt to show that each philosopher was an active participant in the social and political milieu in which they resided and often well beyond its confines, contrary to what most contemporary scholars seem to suggest. In conjunction with this, they all seem to have advocated the rule of law and all seem to have been strong pro-

ponents of democracy or its nascent equivalent, *isonomia* and this, despite the fact that they all came from wealthy and/or aristocratic backgrounds. Moreover, they all saw a reciprocal relation between microcosm and macrocosm and, in various degrees, they all argued that political theory and practise (indeed the general structure of the state) should be grounded in cosmology.

I also attempt to connect the philosophers with one another since it is abundantly clear that they were all well aware of their respective works which was prompted to a large degree through the written word and the facility of travel by sea. Indeed, it is clear that the awareness of their respective *historia* and their own distinctive cultural milieux, travels, temper, spirit of *agōn*, fostered the originality of the respective *historia*. Moreover, they were all preoccupied with the pursuit of *alētheia* (truth) rather than *kleos* (glory) whence the importance of anchoring their *historia* in a *logos* or a reasoned argument.

Despite references to *theos*, their universal systems are explained in terms of natural causes as is the origin of human beings. It is the fact that human beings are given a real beginning in time that drives, in my view, their respective views on the origin of civilization. However, I also attempt, within the limits of space, to account for a number of specific features in their respective *historia*, including views on the nature of the soul, knowledge, wealth, morality, harmony, justice, virtue, law, and divinity. It was indeed the fact that the divinity was to be eventually entirely eliminated from the functioning of the universe that prompted Plato to write his own *historia* of the *peri phuseōs* type for the consequences of this, in his eyes, were responsible for the nihilistic attitude toward morality and the state. This will be addressed in the second volume.

This page intentionally left blank.

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.¹

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”² 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”³—its etymological meaning of “growth” still persists in Homer.⁴

If one considers that all the compounds of the term *phusis*⁵ 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.⁶ 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.⁷ 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*.⁸ 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 *eidos*, *morphē*, or *phuē* (all of which are found in Homer), insofar as the moly plant is identified by its form.⁹ It seems Homer could have written *kai moi eidos (morphē; phuē) autou edeixe*. However, that Homer does not employ

the terms *eidos*, *morphē* or *phuē* 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.”¹⁰ In other words, while *eidos*, *morphē* and *phuē* 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.¹¹ However, as Alfred Heubeck correctly notes, “*deiknunai* may mean not only showing something visible, but also giving instruction.”¹² 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,¹³ 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*.¹⁴ Meanwhile, since the moly plant is characterized as a “divine” plant and thus revealed in “divine” language,¹⁵ 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.¹⁶ 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.¹⁷ 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.¹⁸ 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.¹⁹

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 properities 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*)²⁰ 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.²¹ 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.”²² 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.²³ 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*.”²⁴

Phusis must be understood dynamically as the real constitution of a thing as it is realized from beginning to end with all of its properities. This is the meaning one finds nearly every time the term *phusis* is employed in the writings of the pre-Socratics.²⁵ 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.²⁶ 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.”²⁷ 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 “*Hērakleitos 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.²⁸ Guthrie (1971, 194), for his part, claims it is safe to say Parmenides employed this title.²⁹ 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).³⁰ 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.³¹ 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.”³² 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.³³

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.³⁴ 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.³⁵ 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 that the materialists understood by nature (*phusis*) the four primary elements (earth, air, fire, and water) of all things (*tōn*