



Early Greek Philosophy

The Presocratics
and the Emergence
of Reason

Edited by Joe McCoy

Early Greek Philosophy

Studies in Philosophy and the
History of Philosophy

General Editor: Jude P. Dougherty

Volume 57

Early Greek Philosophy

The Presocratics and the Emergence of Reason

Edited by Joe McCoy



The Catholic University of America Press
Washington, D.C.

Copyright © 2013

The Catholic University of America Press

All rights reserved

The paper used in this publication meets the minimum requirements of American National Standards for Information Science—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

∞

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Early Greek philosophy : the Presocratics and the emergence of reason /
edited by Joe McCoy.

pages cm. — (Studies in philosophy and the history of philosophy ;
volume 57)

Includes bibliographical references (pages) and indexes.

ISBN 978-0-8132-2121-2 (cloth : alk. paper) 1. Pre-Socratic philosophers.

2. Philosophy, Ancient. I. McCoy, Joe. II. Kahn, Charles H. Achievement of early Greek philosophy.

B1875.E27 2013

182—dc23

2012041070

IN MEMORIAM

Kurt J. Pritzl, OP
1952–2011

Contents

Abbreviations ix | *Joe McCoy*, Introduction xi

1. *Charles Kahn* The Achievement of Early Greek Philosophy: A Drama in Five Acts: From Thales to the *Timaeus* 1
2. *Kurt Pritzl, OP* Anaximander's *apeiron* and the Arrangement of Time 18
3. *Kenneth Dorter* The Problem of Evil in Heraclitus 36
4. *Carl A. Huffman* Reason and Myth in Early Pythagorean Cosmology 55
5. *J. H. Lesher* A Systematic Xenophanes? 77
6. *Alexander P. D. Mourelatos* Parmenides, Early Greek Astronomy, and Modern Scientific Realism 91
7. *Patricia Curd* Where Are Love and Strife? Incorporability in Empedocles 113
8. *Daniel W. Graham* Anaxagoras: Science and Speculation in the Golden Age 139
9. *John C. McCarthy* Bacon's Third Sailing: The "Presocratic" Origins of Modern Philosophy 157
10. *Richard Velkley* Primal Truth, Errant Tradition, and Crisis: The Presocratics in Late Modernity 189

Bibliography 209 | Contributors 221

Index of Sources 225 | Index of Names 229

Index of Subjects 233

Abbreviations

- DK H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker*, 6th ed. (Berlin, 1951), and later editions, in which each Presocratic is assigned a number. In addition, each fragment is assigned a number preceded by a “B”; *testimonia* are given numbers preceded by an “A.” For example, the number for Anaximenes is 12, and thus Anaximenes’s fragment 1 is assigned the Diels-Kranz number: “DK 12B1.” Line numbers are indicated by final decimal numbers. Thus, e.g., line number 4 of Empedocles’s fragment 17 is noted as: DK 31B17.4. In the present volume, the practice is to drop the initial DK, since Diels-Kranz numbering is used throughout, as well as the initial Presocratic number, unless the context does not make clear which Presocratic is being considered.
- HGP W. K. C. Guthrie, *A History of Greek Philosophy*, 6 vols. (Cambridge, 1962–1981). Only the first two volumes concern the material treated in the present work.
- KR G. S. Kirk and J. E. Raven, *The Presocratic Philosophers* (Cambridge, 1957).
- KRS G. S. Kirk, J. E. Raven, and M. Schofield, *The Presocratic Philosophers*, 2nd ed. (Cambridge, 1983).
- LSJ H. G. Liddell and R. Scott, *A Greek-English Lexicon*, revised by H. S. Jones, 9th ed. (Oxford: Clarendon Press, 1940); with a supplement, 1968.
- PSP J. Barnes, *The Presocratic Philosophers*, rev. ed. (London: Routledge & Kegan Paul, 1981).

Introduction

I. THE GREEK MIRACLE

This volume arose from a lecture series, “Early Greek Philosophy: Reason at the Beginning of Philosophy,” hosted at the Catholic University of America during the fall of 2007, and it represents a series of reflections on the “Presocratics,” a group of thinkers who were a primary occasion for the emergence of what is often referred to as the “Greek miracle.” We can date this naissance of culture and multifaceted flowering of the arts and sciences among the Greek-speaking peoples around the Mediterranean from the birth of the first wise man of the Western world, Thales, c. 624 B.C.¹ until the end of the Peloponnesian War in 404 B.C. This volume thus comprises a study of a set of key individuals at the beginning of this story and constitutes another testimony to their accomplishments in developing that peculiar yet natural mode of reason subsequently named philosophy.

Charles Kahn describes the innovation in thought we now call “philosophy” or “science” by tracing out the early development of these notions in five stages or “acts” in the drama of early Greek thought. As he points out, this “inquiry into the nature of things (περὶ φύσεως ἱστορία)”

I am indebted to many individuals for their assistance in my preparation of this introductory section, and without attributing any of the content, much less the errors and omissions, to them, I would particularly like to thank Monica Cortright, Alisha Anne McCoy, David Rochnik, and Matthias Vorwerk for their helpful suggestions.

1. All dates relating to the births, deaths, and periods in which the various Presocratics flourished are taken from Long, *Cambridge Companion to Early Greek Philosophy*, xvii–xxviii. All dates are approximate.

consisted in a certain mode of reasoning about the world and of reflecting on one's place in it, as distinct from early Greek religion and the mytho-poetic worldview embodied in Hesiod and Homer. Thus the new philosophy consisted in a view of the world as "independent of human and divine art . . . but which is nevertheless available for understanding." Yet the origins of Greek philosophy were not exactly a rejection of the traditional gods so much as a denial of their capriciousness in shaping the world. The crucial break that the Presocratics made was in forging an understanding of "nature (φύσις)" as orderly and intelligible in its own right—a notion, which, as Kahn points out, we have taken for granted ever since, but which is by no means self-evident or easily translatable into other languages and cultural settings. In addition to "φύσις," the Presocratics developed two other, core philosophical notions—"λόγος," which may be rendered as "reason," "ratio" or "proportion," "word" or "speech," and the third, "ἀρχή," which may be translated as "beginning," "origin," "rule," or "principle." Clearly these notions are interdependent: nature as such has an order, structure, or form that hails from its fundamental elements, its ἄρχαι, and as part of nature, man participates in this order through his reason that is reflected in his speech about reality.

Generally stated then, the purpose of this volume is to elaborate the development of certain basic philosophical notions by the Presocratics as well as to study their later reception in the philosophical tradition of the West.² All of the essays in this volume constitute in-depth studies of this emergent conception of "nature" and the correlated notion of rationality that is suited to comprehend it. That is, in these studies we meet not only the Presocratic accounts of the nature of reality, but also the peculiar "philosophical" mode of thinking about reality that emerges through these accounts. Discerning the meaning of these early teachings and reconstructing the vision each Presocratic attempted to bequeath to us often involve a great deal of uncertainty because of the scarcity of evidence, possible corruptions or distortions in the testimony that has come down to us, and, in general, the remoteness of their linguistic and cultural setting. Thus, unavoidably, every essay in this collection grapples

2. For a fascinating discussion of how the Greek language itself contained certain potentialities for abstract, and so scientific, thought, see Snell, *Discovery of the Mind*, esp. ch. 10 ("The Origin of Scientific Thought"). This is not to downplay the genius required to unlock these potentialities.

with a host of problems stemming from the remote antiquity of these thinkers and the paucity of their literary remains.

II. THE PHASES OF PRESOCRATIC THOUGHT

From the birth of Thales, the first wise man of the West, to the death of the last great Presocratic, Democritus, around 370 B.C.,³ two and a half centuries had passed. It is helpful for us to separate this age into smaller periods, with the caveat that such divisions are constructed for heuristic purposes rather than being objective historical markers.⁴ As Jonathon Barnes says:

The Presocratic period itself divides into three parts. There was first a century of bold and innovatory thought. Then the early adventures were subject to stringent logical inspection: the dawn they had heralded seemed a false dawn—their discoveries chimerical and their hopes illusory. Finally, there were years of retrenchments and consolidation, in which thinkers of very different persuasions attempted each in his own way to reconcile the aspirations of the first thinkers with the criticisms of their successors.⁵

So without the expectation that these divisions are neat and unproblematic, let us examine some of lines of development and points of contrast that permit them to be made at all.

A. Phase One: The Milesians

The first phase of “bold and innovatory thought” is a just description of the philosophical course initiated by Thales and carried forward by his fellow Milesians, Anaximander (610–546 B.C.) and Anaximenes (fl. c. 546–526 B.C.). Whatever their differences and disagreements—and we can only

3. For comparison, Socrates lived 469–399 B.C., meaning that a “Presocratic” actually survives Socrates himself, though Democritus was not a follower of Socrates. The last Presocratic was Diogenes of Apollonia (b. 460 B.C.), though he is not typically regarded as being in the first rank of Presocratic thinkers.

4. Arguably, the term “Presocratic” is itself somewhat tendentious, and it was certainly not in use in the ancient world. The *Oxford English Dictionary* locates its first recorded use in the title of the third book of Ritter’s *Geschichte der Philosophie*, vol. I, namely, “Die Geschichte der Vorsokratischen Philosophie,” originally published in 1829. The term, then, might best be understood as a statement about the significance of Socrates in the history of philosophy rather than about any common enterprise shared by the “Presocratics.”

5. Barnes, *Early Greek Philosophy*, xii.

speculate about these on the basis of their various conclusions—the Milesians seem to be engaged in an attempt to identify and describe the ground or principle of reality, that is, intelligible, constant being that stands behind sensible and mutable becoming. To Barnes’s description of this initial, “adventurous” phase, we might also add that it radiates a certain spontaneity, freshness, and vigor in comparison to the Milesians’ more cautious successors. While it may be due to the sparseness of available evidence, one does not detect in the Milesians the inhibitions and tentativeness found in later thinkers for whom the problematic nature of the enterprise comes to the fore. With the Milesians, we can discern a certain optimism, even wildness, in their attempts to peer through becoming into being. Indeed, one might take their divergent views regarding the nature of the first principle—water (τὸ ὕδωρ), the unbounded or unlimited (τὸ ἀπειρον), and air (ὁ ἀήρ), respectively—as a sign of boldness and zeal that can easily be mistaken for a lack of rigor.

It is an often overlooked fact that Greek philosophy did not begin in Greece, but rather in Greek colonies around the northern Mediterranean—first on the coastal trading towns in what is modern-day Turkey and then migrating to Greek settlements in Italy. The beginnings of philosophy are necessarily obscure, but tradition identifies the first practitioner of this discipline. Thales of Miletus, lived and wrote from approximately 624 B.C. to 546 B.C. in Miletus, a city in Asia Minor. No fragments of Thales are extant, and what remains of his thought is referred to, though not directly quoted, in the works of those who lived some centuries after him.⁶ Of all the accomplishments attributed to Thales, he is perhaps best known for the assertion that, in some sense, all things are water.⁷ Aristotle credits Thales with initiating the new scientific or naturalistic outlook:

So, too, nothing else is originated or destroyed without qualification; for there must be a nature (φύσις), either one or more than one, out of which things are generated, but which itself endures. . . . Thales, the pioneer of this kind of philosophy, says that it is water (and therefore proclaimed the earth to be on water),

6. See *ibid.*, 2–28 and *KRS*, 88–95, for ancient sources regarding Thales’s teachings concerning water.

7. See *HGP*, vol. I, 54–72, for an extensive discussion of the possible reasons for Thales’s choice of water.

probably having this idea suggested to him by the fact that the nutriment of everything is moist and that heat itself is born out of the moist and kept alive by it?⁸

Why should water instead of some other substance enjoy this preeminent place in the hierarchy of the world? Even accepting Aristotle's observation concerning the relationship between life and water, it is still a great leap to pronounce water to be the fundamental substance. What does the choice of water for this role imply about the physical constitution of the world as a whole?

The traditional view of Thales as being primarily a natural philosopher, one of the "*phusikoi*," as Aristotle called the Presocratics,⁹ has increasingly become of object of scholarly criticism.¹⁰ It may be true that Thales's enterprise—as well as that of his successors—was one of observing and categorizing relations among natural substances and that, continuing along this path, he was led to postulate the special role that water plays. If so, Thales would have been struggling to follow the road up from concrete physical objects to higher order realities. It may be, however, that Thales was already more of a philosopher than the subsequent tradition has been inclined to admit. Thales may have *begun* with the vision of a world consisting in a harmonized order within which no part is ultimately disconnected from any other part, and then cast about for materials and objects available to him with which to communicate this vision. Here Thales would be following the road down in showing how the lower order realities are fitted to and are subsumed under the higher. Or perhaps he regarded both the upward and downward perspectives on the cosmos as complementary aspects of his outlook.¹¹ Adopting the more

8. Aristotle, *Metaphysics* A.3.983b17–23.

9. See *Metaphysics* A.8.990a1–2.

10. See O'Grady, *Thales of Miletus* for a current, exhaustive study of Thales. The view that the Milesians were monists and that subsequent Presocratics reacted to this basic position is far from certain. See, e.g., Graham, "A New Look at Anaximenes," 14, who states: "There is only one material monist in pre-Socratic philosophy. It is not Anaximenes or Thales, not Heraclitus or Xenophanes: it is Diogenes [of Apollonia] . . . Aristotle read Anaximenes in light of Diogenes as he read Anaximander in light of the post-Parmenidean pluralists. And he projected the metaphysics of the later philosopher onto the earlier."

11. Two arguments may be offered to show that Thales was not a materials scientist, or a "material monist," in the sense of that term defined by Graham, "A New Look at Anaximenes," 3: First, Anaximander's "*apeiron*" is too abstract to be a physical element that is simply unknown or unfamiliar to us, and his choice of "the unlimited" as somehow prior or primary is nestled historically between the allegedly naïve materialism of Thales and Anaximenes, respec-

philosophical, or “road up,” view of Thales may allow a narrow view and may invite more fruitful interpretations of his thought,¹² but it does not exempt him from criticism: if his true object was “being” and water was the substance he held to be most virtual or “being-like,” it will be the characteristics and properties of water to which we must refer in analyzing his vision of what exists. To put the matter another way, at some point, all analogies convert to falsehoods, and to understand Thales’s philosophy fully, knowing how water is not being-like is as important as knowing how it is.

The paucity, that is to say, the absence, of Thales’s literary remains makes this sort of debate over the significance and intentions of his thought interminable. But from the point of view of historical and philosophical research, Thales is the most extreme instance of a problem that attends our inquiry into any of the Presocratics. We must contrive to reconstruct their thought given the political, cultural, and linguistic knowledge we do possess, while simultaneously allowing for what was a highly original, indeed unprecedented, advance in human thought and reasoning about the world.

Kurt Pritzl’s treatment of Anaximander’s rejoinder to Thales is premised on the opacity of the former’s choice of “the unlimited (τὸ ἄπειρον)” as first principle: What could Anaximander have meant by “the unlimited”?¹³ Is “the unlimited” another thing, like water, whose properties somehow intimate being? If “the unlimited” means “without boundary or form” and so “unintelligible,” this contradicts Thales’s insight into the basic rationality of the world? Pritzl’s answer to this basic

tively. I.e. if we assume any sort of exchange or common enterprise among the Milesians, then Thales’s views on water were most likely formulated to answer the same sorts of concerns as Anaximander’s *apeiron*. Second, one might well be a material monist and hold that the physical elements somehow all change into each other. But if so, one cannot hold that any one physical element has primacy over any other. In other words, holding that water turns to fire and back again, is logically equivalent to holding that fire turns to water and back again. I.e., the cyclical change among elements is in conflict with the primacy of any one element.

12. See Rescher, *Cosmos and Cognition*, esp. ch. 3 (“Thought Experimentation in Presocratic Philosophy”), who regards his own study as a kind of “imaginative projection” with the aim of articulating the patterns of reasoning in a number of Presocratics. While not agreeing with each specific conclusion, I find this to be the most philosophically fruitful approach available to us in recovering the spirit of the Presocratic philosophers, which, of course, must be supplemented by historical and philological tools.

13. See KRS, 105–17, for an exhaustive list of the various properties and functions of “τὸ ἄπειρον.”

problem is that Anaximander “conceives the *apeiron*, which surrounds and steers the phenomenal universe, as the eternal and ageless encompassing spherical limit of the whole.” It is “infinite,” therefore, in the sense that it “presents no bounds for a traverse that must begin at one point and end at another.” Just as important as this conclusion, however, is Pritzl’s method for recovering it, which involves an exacting study of the word in Anaximander and other ancient sources, a close reading of Anaximander’s work still available to us, and the application of what is known from other philosophical activity in the vicinity of Anaximander’s life. His interpretation has the happy consequence of retaining, even reinforcing, Thales’s insight as to the basic orderliness and intelligibility of nature, and indeed, represents a “position about the nature of the whole that is maintained by every philosopher after him [i.e. Anaximander] with the exception of the atomists.”

The third Milesian philosopher, Anaximenes, holds that the first principle is “ὁ ἀήρ”—a word cognate with the English word “air,” but which might be better rendered as “mist”—which transforms into other elements through the twin process of condensation and rarefaction. But this generates a puzzle. Whereas Thales could plausibly be regarded as a primitive physicist through his elevation of a physical element to an explanatory principle, Anaximander’s abstract “unlimited” seems to take us beyond the realm of physics. Why, then, does Anaximenes return philosophy back to a common physical element as first principle? One answer is that Anaximander’s “unlimited” is a disguised, or unknown, physical element, but this is very unlikely. Another is that the significance of Anaximenes’s “mist” (and so probably Thales’s water as well) is not the physical element of a straightforward physical theory for which it is often taken.

A possible solution is that Anaximander proceeded from a purely physical critique of Thales. For example, he may have considered the obvious difficulty in holding that water is the first principle of an element such as fire.¹⁴ “The unlimited” is a better description of being itself if we take the basic being/becoming distinction as given. Entities emerge

14. Burnet, *Early Greek Philosophy* (hereafter *EGP*), 56, makes this suggestion in his reconstruction of Anaximander’s argument for “τὸ ἄπειρον” as first principle. See also Barnes, *The Presocratic Philosophers*, 29–31, who reconstructs four arguments from the doxographical tradition as to why Anaximander may have held “τὸ ἄπειρον” to be the first principle.

out of being and are discernible as discrete units by virtue of their unified shape, form, or limit (πέρας). Conversely, the passing-away of things must be a process of returning to being itself and thus losing characteristics that distinguished things from being itself. If coming-to-be is a movement away from being into distinct, formed beings, then to pass away is to lose form and to become similar to being. Therefore, being itself is formless or “unlimited.”¹⁵

The transition from Thales to Anaximander reveals a perennial feature of philosophical theorizing: for every problem solved, another arises. Anaximander puts to rest the problems of describing being itself in terms of the phenomenal properties of water, but he does so by disallowing a description of being in terms of any phenomenal properties whatsoever. “The unlimited” or “the boundless” lacks form and intelligibility; it is *per se* unknowable. Anaximander thus leaves philosophy in a highly unsatisfactory situation: reality is to be explained by reference to something that is not just difficult to comprehend, but is, in principle, incomprehensible.

Here Anaximenes begins to come into focus. In an act of what might be termed bold conservatism, he restores and explicitly recommits philosophy to a view of intelligible being. Although just as intelligible a substance as water, “air” is not susceptible to the “fire” problem, since one could regard fire as a highly refined and especially energetic mode of ὁ ἄήρ.¹⁶ Of course, we know that “ὁ ἄήρ” will not be the last word on being itself, and although Anaximenes avoids the fire problem, it is difficult to see how he can avoid the problem of explaining how earth, especially earth well above the freezing point of water, can be a mode of air. We

15. As McKirahan, *Philosophy Before Socrates*, 49, says: “It [i.e. τὸ ἄπειρον] is unfamiliar and alien to our experience, barely describable or comprehensible; it is not found in our KOSMOS. Air is a better principle than the APEIRON in these respects. In fact, there can be no objection to theories based on a single principle of a definite kind as long as they generate the wide variety of things found in the KOSMOS in an acceptable way. Further, Anaximander’s account of the generation of the KOSMOS is itself crucially flawed in precisely this way, since it depends on something whose origin from the APEIRON is left obscure” (capitals in original). Yet see *HGP*, vol. I, 78, where the “imperceptibility” of the *apeiron* is regarded as a “momentous step” forward for physical science, despite the problems that arise in connection to it.

16. *KRS*, 145–46, where it is noted that ὁ ἄήρ is “boundless” in a way that Thales’s water is not. In other words, Anaximenes’s “air” is a “determinate infinity” unlike Anaximander’s “indeterminate infinity” (see *EGP*, 77, quoting Theophrastus). Hence, Anaximenes incorporates both the insight of Thales as to the intelligibility of the first principle as well as Anaximander’s criticism of Thales’s choice of first principle.

also know that “mist” is a compound, a mixture of two true elements, air and water vapor. If $\acute{\omicron}$ $\acute{\alpha}\eta\eta\acute{\omicron}$ is not primitive and so not an element, then it is not being and not a first principle.¹⁷

B. Phase Two: The Rise of Parmenides

J. H. Lesher’s essay is addressed to a transitional figure between the first and second phases of Presocratic philosophy, Xenophanes of Colophon (b. 570 B.C.), an individual sometimes viewed as a poet and rhapsode who was mistakenly admitted to the ranks of the Presocratic philosophers. Lesher provides a lesson in the reconstruction of the philosophical teachings of Xenophanes, which task is particularly difficult given the paucity and fragmentary nature of his literary remains. Specifically, Lesher examines remnants of Xenophanes’s thought about the cosmos, the nature of divinity, and the power of and limitations on the human capacity for knowledge. Bringing linguistic, historical, and background knowledge of other Presocratic philosophers to bear, Lesher argues that Xenophanes’s literary remains “may reasonably be thought to have embodied an integrated understanding of the cosmos and of the divine, as well as a view of how far human beings can discover the sure truth concerning matters in either domain.”

If we cannot precisely date when the second phase of “stringent logical inspection” began, we are at least certain of being in the midst of it once we reach Parmenides of Elea (b. 515–d. 449/440). Indeed, the “Parmenidean challenge” may be taken as alternative name for this second phase of Presocratic thought, his teacher, Xenophanes,¹⁸ and his followers, Melissus (b. early 5th century B.C.) and Zeno (b. 490 B.C.), being planets in the Parmenidean orbit.¹⁹ Parmenides surpasses his predeces-

17. See Burnet, *EGP*, 78, who makes this point. See also *PSP*, 45, for problems with $\acute{\omicron}$ $\acute{\alpha}\eta\eta\acute{\omicron}$ as first principle.

18. As Aristotle reports at *Metaphysics* A.5.986b18.

19. Melissus expounded in prose the sort of Eleatic monism found in Parmenides’s hexameter verses. Sedley, “Parmenides and Melissus” in Long, *Cambridge Companion*, 113–33, argues that Melissus has been unjustly eclipsed by Parmenides and deserves recognition for originality in his arguments, if not his conclusions. Zeno was Parmenides’s student and is most well-known for his famous paradoxes. The flavor of Zeno’s writings was perhaps best captured by Socrates at Plato’s *Parmenides* 128a–b: “You [i.e. Parmenides] in your poems say that All is one . . . but this fellow [Zeno], in turn, says that it’s not many . . . One says ‘The One’ and one says ‘Not Many’, and so each speaks so as to seem to say nothing the same, while you are saying nearly the same thing.”

sors for sheer ontological economy: there is only being, indivisible and immutable. But he also bests them in methodological elegance, since all his conclusions are presented as strict logical derivatives of a purely logical truth: what-is must be; therefore, what-is-not cannot be.²⁰

But Parmenides represents a challenge not just for historical reasons, since his accomplishment consists in pressing the priorities of the Milesians to their ultimate conclusions—the one over the many, reality over appearance, reason over the senses. Indeed, in one deft stroke, Parmenides severs that Gordian knot in reality that we can detect as early as Thales—the problem of the relation of becoming to being. Since the notion of “genesis” can only mean a mixture of being and non-being, it involves a contradiction; therefore, becoming cannot be. Consequently, Parmenides’s isolation of being from becoming is literally beyond belief: If “becoming” is an oxymoron, then our ordinary perceptions of the world in which multiplicity and variation predominate are not simply flawed or limited, but radically false. Although his thought represents a consummation of many aspects of the Milesian revolution, Parmenides wholly rejects a key aspect of it: he denies that appearances are appearances of being, at least insofar as being might be supposed to be manifest to the senses.²¹

Parmenides’s successors worked to circumvent the radical disconnect between τὰ φαινόμενα (appearances) and τὸ ὄν (being) affirmed by Parmenides, but there are clues in Parmenides’s own writings that his treatment of appearances was more subtle than a simple rejection of them. Parmenides’s teachings regarding being are found in “The Way of Truth,” the first part of his poem. The second part, “The Way of Opinion,” seems to be the negative complement to the first part, summarizing how the facets of ordinary opinion and common perception are “deceitful” and not worthy of “genuine credence.”²² As Guthrie states the problem:

20. See McKirihan, *Philosophy before Socrates* (hereafter *PBS*), 159, who suggests that “the goddess” of Parmenides’s poem is the previously unknown goddess of logic.

21. It is arguable that, had the Milesians truly been material monists, Parmenides’s account of being would have been merely a refinement of their thought and not revolutionary, since Thales would have taught approximately a century earlier that all things are “really” water and appearances to the contrary are false. This adds credence to the view that Thales’s notion that being is in fact water should be viewed in the sense that Parmenides’s being was in fact a solid sphere (see DK 28B8.42–44), that is, not literally such, but an image that intimates the properties of being.

22. See DK 28B1.30.

Here is the crux. Why should Parmenides take the trouble to narrate a detailed cosmogony when he has already proved that opposites cannot exist and there can be no cosmogony because plurality and change are inadmissible conceptions?²³

Alexander P. D. Mourelatos points out that, while the tone of Part One, the Way of Truth, is strident regarding opinion, it is at the same time “scientifically informed” and contains truths of paramount importance relating to such matters as the source of the moon’s light, the disappearance of the stars during the day, and the appearance of and relationship between the Morning Star and Evening Star. According to Mourelatos, the *Doxa* section “represents scientific discoveries made by Parmenides himself or reflects his own engaged grappling with quite recent discoveries made by others.” Such discoveries include the fact that the moon’s light is reflected sunlight, that the stars in the sky are not consumed in the day but rather their light is overwhelmed by the sun’s glare, and that the Morning Star and the Evening Star are the same astronomical body. What is to be done with the *Doxa* section of Parmenides poem, which he himself calls “off-track,” “deceptive,” and “lacking genuine credence”? On Mourelatos’s interpretation, the *Doxa* section of the poem “may no longer be taken as merely polemical.” On his reading, ordinary opinion does have some relationship to what-is, but only when scrutinized by reason. For example, stars cease to appear during the day. But what seems to be so, i.e. “what is deemed to be so” in common opinion, is that the stars cease to shine or even cease to exist. The falsity of this belief itself is discerned by the very power of reason that comprehends that the sun’s light blocks that of the stars. Accordingly, as Mourelatos says, this view of Parmenides “should [not] be taken as mitigating the very sharp contrast [he] posits between ‘Doxa’ and ‘Truth,’” since the opinion of the star’s disappearance is as false as it could be.

C. Phase Three: Responses to Parmenides

Barnes’s third phase of “retrenchments and consolidation” is characterized by a series of responses to Parmenides, and we must emphasize that these responses were not refutations, for we can find no subsequent Presocratic who directly refutes Parmenides’s denial of change and mul-

23. *HGP*, vol. II, 5.

tiplicity. What we do find are attempts to circumvent this result through a theoretical framework that makes this denial unnecessary and so dismissible. And Barnes is correct to choose the plural, “retrenchments,” to describe the aftereffects of Parmenides’s thought, since we encounter many strategies, a variety of methods and hypotheses, for reconciling the disparate strands of what by now had become a philosophical tradition. In a sense, all the post-Parmenidean philosophers are mixed types, since they evidently saw Parmenides’s separation of appearance from being and his abolition of becoming as results to be obviated, but his methodological elegance and exactitude as something to be imitated.

The figures of Empedocles of Acragas (b. 492–d. 432 B.C.), Anaxagoras of Clazomenae (b. 500–d. 428 B.C.), and Democritus of Abdera (b. 460 B.C.) form the high points of this third phase of Presocratic philosophy, and their side-by-side comparison reveals the course and direction of philosophical thought after Parmenides. First, we notice in these thinkers the increased willingness to admit plurality into their conceptual schemes. Second, there is more concern to specify the mechanism of interaction and change among the plurality of elements and to identify these forces as the first principles. Third, there is the evident concern to formulate their ontological principles in such a way as to allow for a more harmonious synthesis between them and the appearances of things.²⁴

Patricia Curd’s essay is an investigation into the nature of the Empedoclean forces of Love and Strife, to which the philosopher assigns responsibility for ordering, that is, collecting together and dividing apart, the four primitive elements, or “roots,” of earth, air, fire, and water.²⁵

24. If the Milesians were not material monists, then one might say that the third phase of Presocratic philosophy represents a return to the lines of thought under development in the first phase, since, in that case, the Milesians did not fundamentally deny the plurality of elements and since there was among them already consideration of the mechanism(s) of change. This is explicit in Anaximenes vis-à-vis the condensation and rarefaction of air and (and probably also in Heraclitus vis-à-vis the primacy of fire). Moreover, it is very difficult to believe that, having asserted water to be the substrate of all things, Thales would have left off thinking about the immediate problem of how this occurs in states of matter so evidently unlike water in nature. Therefore, it is not beyond belief to hold that every Presocratic from Thales on down distinguished appearance and reality and that Parmenides was exceptional, not for making the distinction itself, but for denying that appearance had no share of truth.

25. However, Aristotle states, “. . . fire he [Empedocles] made a unique kind of agent, whereas earth, air, and water he treated as having the same nature, being opposites of fire. Anyone who reads the verses of Empedocles reflectively will get this doctrine out of them” (*Metaphysics* A.4.985b1–3). See also Aristotle, *On Generation and Corruption* B.3.330b19. Yet, as Bur-

Asking whether they are the purely materialistic forces of a physicist or the spiritual, non-corporeal first principles of a metaphysician, Curd argues against the view that Love and Strife are corporeal, i.e. that they are “stuffs” in the sense that the four elements are. She states: “. . . while Love and Strife indeed share foundational metaphysical status with the roots, they are not material, and have no spatial location.” Rejecting a prevalent view that none of the Presocratics had any conception of a non-material substance due to their cultural and intellectual limitations, Curd’s detailed analysis demonstrates not only that Empedocles’s texts do not require us to assume that he had no conception of incorporeality but also that they provide good grounds to hold that he did.

We can see that efforts of Empedocles and Anaxagoras represent syntheses of previous physical theories guided by a sense of elegance and parsimony. Empedocles’s account of the cosmos requires only the four traditional elements—earth, air, fire, and water—and two forces that bring about their combination and separation Love and Strife, respectively.²⁶ Anaxagoras is even more theoretically rigorous. To explain the present state of orderliness in the world, we need only two ontological postulates: first, that all matter in the world is presently in a state of “mixture,” and second, that a single force of separation governs this mixture.²⁷

net notes, this is not at all clear from Empedocles’s writings, a fact which suggests either that Aristotle had other sources available to him, that he was aware of some connection between Empedocles and Heraclitus that would justify the special place of fire in the former’s ontology, or that he was simply mistaken on this point. As Burnet notes: “It is often said that this [Empedocles’s] system was an attempt to mediate between Parmenides and Herakleitos” (*EGP*, 261). However, Empedocles seems to be preoccupied with Parmenides more than with Heraclitus. See *EGP*, 261–63 and *KRS*, 283.

26. Empedocles can be modified in this respect: Since Love and Strife each are responsible for both collecting together and dividing apart elements (Love for collecting unlikes and dividing likes, Strife for collecting likes and dividing unlikes), “Strife” can be regarded as love among like elements, i.e. “love of one’s own,” and so the agent of bringing together what is similar and separating off what is different. This suggestion is found in Leo Strauss’s *On Plato’s Symposium*, 108: “Empedocles said there are four elements and everything that happens is either union or disunion, either love or destruction. But this has a subtlety: war is only another form of love, namely the love of the similars. If the different elements come together, the cosmos disintegrates.” Empedocles’s view that two forces are required to effect collection and division of the four “roots” may have been the impetus, at least in part, for Anaxagoras to reduce his postulated entities to one force, separation through Mind, and one sheer mixed state of matter. This is possible as Empedocles was the earlier writer (see Aristotle, *Metaphysics* A.3.984a11–12).

27. Accordingly, the greatest difficulties with Anaxagoras’s system concern (1) the coher-

Daniel Graham's overview of the life of Anaxagoras recounts the physical assumptions as well as the philosophical methodology that arose in Anaxagoras's work in response to the Parmenidean challenge. Graham examines Anaxagoras's fundamental hypotheses and brings into focus the beauty of the Anaxagorean synthesis that lies in its reduction of theoretical postulates. Anaxagoras's set of postulates was formulated not just for the sake of logical elegance—although, as Graham points out, his system is striking in its parsimony and must have been the product of a self-conscious effort to respond to the Parmenidean challenge in the most theoretically concise and powerful way. Graham argues that Anaxagoras's axioms constitute a framework for understanding how the basic nature of reality was disclosed to observers and thus they provide a general framework for scientific research of the sort the philosopher conducted regarding the solar eclipse in 478 B.C.

We do not know how many basic elements Anaxagoras believed are present in the world. But whatever the number, one of Anaxagoras's basic assumptions is that each finite portion of matter contains some amount of every element,²⁸ and with this axiom in place, we need not assume two forces, as Empedocles did, since, beginning in the state of utter mixture, the cosmos is ordered solely through the act of separation accomplished by the cosmic Mind (Νοῦς). Anaxagoras's theory certainly runs counter to our physical intuitions. We tend to think of ordering fundamentally as an act of composition or synthesis, not division, and analogously we tend to view acts of mind and understanding as fundamentally comprehensive and holistic, rather than analytic.²⁹ However, we should expect

ence of his notion of an infinitely divisible mixture and (2) the purchase that Mind has, and the manner in which it could have it, on the mixture. See Aristotle, *Metaphysics*, A.4.985a18–23 and Plato's *Phaedo* 97b–99d for criticisms on this second point. See Graham, "Empedocles and Anaxagoras" in Long, *Cambridge Companion*, 163–64, and Graham, "The Postulates of Anaxagoras," for a list of Anaxagoras's axioms for his entire system. See Simplicius, *Physics* 155.23, as quoted in *HGP*, vol. II, 294.

28. In fact, Anaxagoras's theory places theoretical limitations on perception, since, at any given time, any number of elements may not yet be sufficiently separated out and clumped together so as to predominate and to be manifest locally. Indeed, if we go far enough back in the past, the mixture would eventually be such that no element could predominate and be observed. See DK 59B1 and B4, where Anaxagoras states that nothing was "plain (ἐνδηλον)" in the beginning. See also McKirhan, *PBS*, 227–28, for a discussion of the seeming contradiction this passage contains.

29. It would be just as logically elegant to suppose that the world began clumped into discrete elements and to assign to Mind the power of compounding. This would explain equally

these postulates to be confirmed not by their *prima facie* plausibility, but through their predictive power vis-à-vis the phenomenal world, and in this respect, they do seem to account for the blend of order and chaos, of unity and multiplicity, that we observe at this stage in the evolution of the cosmos.

III. HERACLITUS AND PYTHAGORAS: THE OBSCURE AND THE OBSCURED

Two Presocratics of major importance were left out of the overview in the previous section, Heraclitus of Ephesus (b. 540–d. 480/470 B.C.) and Pythagoras of Samos (b. 570–d. 490 B.C.), as these figures are difficult to assimilate into the above tripartite scheme. In the case of Heraclitus, this is due to the extreme obscurity of his style and manner of expression; in the case of Pythagoras of Samos, it is because of the historical obscurity of his life and activities. Nevertheless, these two thinkers represent important forces in the Presocratic world and for subsequent philosophy.

Historically and geographically, Heraclitus is located nearest to the Milesians,³⁰ and in some ways he seems to continue and modify their train of thought regarding being and the ground of becoming. Heraclitus identifies this as fire (τὸ πῦρ): “All things are an exchange for fire and fire for all things, as goods for gold and gold for goods” (B90).³¹ We have seen that interpreting Thales’s words analogically as well as literally yields the insight that his choice of water as first principle may be a way of intimating the general properties that being itself must possess. We

well the order of things at this middle era in the development of the cosmos, and furthermore, it would have the happy consequence of prioritizing synthesis in the ordering operation by the act of Mind, which is more consonant with ordinary experience. Also this would sidestep the conceptual difficulties with the notion of an infinitely divisible mixture, since this state of sheer mixture would be a theoretical point infinitely far off in the future, which the cosmos would approach asymptotically but never quite reach. Why, then, didn’t Anaxagoras take this road? Anaxagoras’s choice of increasing separation as time progresses implies the increasing manifestation of elements. If he had reversed the direction and held the universe to be an increasing mixture of elements, then as time progresses each particular element is less able to predominate. Ultimately, the world would tend toward a state of utter concealment of each element and so toward the unintelligibility of nature.

30. Ancient Ephesus was approximately thirty miles due north of Miletus on the coast of Asia Minor.

31. Translation is from Barnes, *Early Greek Philosophy*, 60. See also fragments DK 22B30 and B64.

are even more tempted to interpret Heraclitus's words in this way, because the obscure, paradoxical, even mystical language he uses seems to be designed to prevent any sort of direct equation of the physical element with being itself.

Kenneth Dorter presents the writings on Heraclitus as a profound meditation on the holistic view of nature toward which the new philosophy was moving. Far from being a naïve epistemological relativist, for which he is sometimes taken, Heraclitus attempts to communicate to us this comprehensive view of the world while proceeding from within the partial, limited, and deformed perceptions that are characteristic of human experience. As Dorter says: "The universe is *both* beautifully ordered *and* irrational, depending on whether we are looking at it macrocosmically or microcosmically." Dorter argues that Heraclitus's cryptic style is thus a result of his *aporetic* conception of philosophy. The partial, limited perceptions of mortals are not simply acknowledged and preserved in Heraclitus's philosophy; they are appropriated and then confounded by an argumentative style that reveals their partiality and so their place in the greater whole.

Why then fire? We might see this choice as a response to the problem of becoming that emerged in Heraclitus's predecessors. Fire is the most energetic of the visible elements; it is material, but also evidences potency, impetus, force. Hence, fire is most evidently a self-moving force while at the same time one of the four traditional elements.³² The separation of being and becoming makes accounting for their relationship difficult, perhaps even impossible, and so Heraclitus may be directing our attention to their coincidence. There are not two worlds, one static and immutable, one changing and in flux; there is one world of both stasis and change, alteration within order, a harmonization of disparate elements, though not a blending or muddling. In this sense of orderly change, of a law-governed clash of opposites, being and becoming can both be preserved by recognizing them as aspects of the same cosmos.³³

32. See McKirhan, *PBS*, 140 and *EGP*, 160–62. Again, we can see anticipations of this in Anaximenes's identification of condensation and rarefaction of $\acute{\omicron}$ $\acute{\alpha}\eta\rho$ as the agents bringing about change (see *EGP*, 163). See also *EGP*, 77–78, where the importance of Anaximenes's thought on this point is noted, as well as 49–50, where a similar point is made with regard to Thales's choice of water as first principle.

33. See Hussey, "Heraclitus" in Long, *Cambridge Companion*, 96–97, who argues that Heraclitus aims for this integration of being and becoming. See also *HGP*, vol. I, 461–69.

The second Presocratic who stands apart from his co-philosophers is Pythagoras, of whom we know very little—indeed, too little even to form a likely hypothesis about his life. What can be said is that the name “Pythagoras” represents the origin of a philosophical school, a community, that viewed philosophy and learning as sacred and number as representing a ruling principle of the world; it seems to have developed a mystical doctrine concerning the interconnectedness of all things that included metempsychosis, the transmigration of the soul.

Carl Huffman investigates the theme of the development of reason out of myth in the specific cases of Pythagoras and his successor Philolaus of Croton (b. 470 B.C.). Pythagoras himself seems to have written nothing, and we cannot even be sure that the famous geometric theorem bearing his name was his own accomplishment. What we can be sure of, however, is the existence of a tradition that explicitly traces its heritage back to this figure. That tradition has passed down sayings, allegedly from the master himself, called “*acusmata*,” that is, “things heard.”³⁴ Considering those sayings that deal with cosmological themes, Huffman shows that “[nine] of the ten *acusmata* equate an item from mythology with a natural phenomenon or part of the natural world . . .” Yet Huffman argues that the correlation of natural and mythical elements is not reductionary and is not meant to reject or explain away the mythical elements, but rather “to reinforce certain religious and moral values connected with Pythagoras’s views on the fate of the soul.” Analogously, the self-avowed Pythagorean, Philolaus, constructs a more rational cosmology in which “the essential feature of things that make up the cosmos is that they are either unlimited, i.e. continua that are not defined by any quantitative limits—or limiters—that is, what puts limits in continua.” The heart of Philolaus’s rational cosmos is its fundamentally unified, encompassing structure. In Philolaus’s own words: “The first thing fitted together, the one in the center of the sphere, is called the hearth” (B7), which harkens back to Parmenides’s view of Being as a sphere (or perhaps back to Anaximander’s conception of the unlimited, as Kurt Pritzl argues). Thus, while there is little evidence that Pythagoras was a scien-

34. *KRS*, 229: “The Pythagorean initiate was presumably required to commit them [i.e. the *acusmata*] to memory, as containing a catechism of doctrine and practice. Their alternative description as *sumbola*, ‘passwords’ or ‘tokens’, suggest that they were believed to assure him of recognition of his new status by his fellows and by the gods, of this world and the next.”

tific thinker akin to the other Presocratics, much evidence shows that subsequent Pythagoreans, such as Philolaus, incorporated Pythagoras's religious and moral concerns into a highly rationalized cosmology.

IV. ATOMS AND THE VOID

The third, post-Parmenidean phase of Presocratic philosophy saw an increased willingness to admit more elements into the world and to be as parsimonious as possible with the forces governing those elements. In other words, after Parmenides, we see various attempts to distinguish “element (στοιχεῖον)” or “material (ὕλη)” from “principle” and to regard the true principles of nature as the immanent forces governing the elements.³⁵ Empedocles, for instance, puts an end to the debates about which element is prior and admits all four. Anaxagoras allows a greater number of elements (whose exact number is to be determined by research), but denies that these elements are discrete and indivisible. Rather, they exist in a state of utter compound and mixture. Democritus admits an infinite number of elements, while in a sense denying there are any overarching principles governing them. In this respect, Democritus appears to be the culmination of this stage of the history of philosophy, and indeed, one might go so far to say that Democritus has only one theoretical assumption about the nature of physical bodies: they are all composites of indivisible, indestructible, and imperceptible “atoms” (literally, “indivisibles”), which differ only quantitatively in weight, size, shape, and orientation.³⁶ Consequently, there is no additional layer of existence, no substrate, no governing forces in addition to the inertial motions of these bodies, which are required to account for the phenomenal world.

35. See Aristotle, *Metaphysics* A.7 and A.8, where he discusses the identification of “elements” and “principle” among the Presocratics and identifies their error as believing that “the matter of things as being some bodily nature” (A.8.988b21–22). In other words, the distinction between “element” and “principle” is the key to responding to Parmenides since, thereby, “becoming” can be viewed as a reordering of elements, which are themselves eternal, as opposed to generation *ex nihilo*.

36. *Metaphysics* A.4.985b4–20. See also *KRS*, 378, which regards Anaxagoras and Democritus to have developed diametrically opposed systems in answer to the same basic set of problems. Taylor, “The atomists,” in Long, *Cambridge Companion*, 181–204, points out that Leusippus of Miletus (b. first half of 5th century B.C.) is to be regarded as the cofounder of this type of atomism and gives an overview of the problems in treating Leusippus's contributions.

If Democritus's world of atoms is fundamentally chaotic, with order and form emerging as a kind of accidental side effect of their collisions, then at least it is theoretically clean. There is no separate realm of being, and so no difficulty in explaining that realm's relationship to change and motion. Democritus is sometimes understood as a kind of twilight philosopher,³⁷ as one who put an end to the metaphysical conundrums and excesses of his predecessors and who places philosophy itself on the firmest empirical foundation possible, despite the fact that atoms are not observable and are not themselves part of what is to be explained. Thus, despite the great multiplicity of atoms in space, the assumption of their existence is logically elegant.

We confront two main issues in the evaluation of Democritus's philosophy. The first is whether the postulate of atoms colliding in the void is in fact an adequate framework for understanding the phenomenal realm. More precisely, what might we look for in the phenomenal world that could falsify this theory? The seeming elegance of Democritus's thought consists in his account of being as wholly derivative of becoming and so his avoidance of a second, higher realm not accessible to the senses. But if the atomic theory does not predict any distinct principle regulating the elements of the world, and if it predicts that random collisions may result in any arrangement of elements at all, then what possible state of affairs *could* be inconsistent with the atomic theory? We seem to be left with the promissory and ultimately unsupported claim that random motion is sufficient to produce the orderliness we observe in the world. If this criticism of Democritus is sound, then his postulation of atoms cannot be differentiated from ungrounded metaphysical speculation of the sort to which his theory seems to offer itself as a corrective.

The second, related issue with regard to Democritus concerns the gods. By the standards of traditional religion in ancient Greece, or most anywhere else, Democritus's theory is atheistic. Whatever their views of traditional religion and to whatever degree these views were integrated into their philosophical accounts, all of Democritus's predecessors maintained some notion of deity.³⁸ Moreover, from Xenophanes and

37. See, e.g., *KRS*, 433.

38. One should be cautious, however, in equating the first principles of the Presocratics with the deity. See Gilson's *God and Philosophy*, 1–37.

Parmenides on down—the One in the latter’s case, Mind in the case of Anaxagoras, or the twin principles of Love and Strife in Empedocles—there was some entity or element that served as the basis of the harmony and unity of the world, which was, in some sense, a philosophical purification of the notion of deity. Indeed, Xenophanes, who is principally remembered for his impieties regarding the gods, never denied there were gods (or a god), but only that they were similar or akin to man.³⁹

The identification of deity with the first principle shows that these two criticisms of Democritus’s theory are closely related. Whatever problems arise in connection with Anaxagorean Mind or Empedoclean Love and Strife (and their purchase on the elements they supervise), they reflect the general sense that brute force and random motion are not sufficient to bring about the degree of orderliness we observe in the world. Indeed, both Empedocles’s and Anaxagoras’s doctrines represent analogical judgments about the cosmos as a whole based on the microcosm of human experience, and such types of judgments about first principles persist in Plato’s demiurge and the *idea of the good* as well as in Aristotle’s prime mover and more tacitly in his doctrine of final cause.

The writings of Democritus force us seriously to rethink when the “dawn of rationality” actually took place, since he and his followers, those such as Epicurus and Lucretius, would necessarily have to judge earlier Presocratic philosophy as still the “specious subtleties of mythologists,” to paraphrase Aristotle.⁴⁰ The picture is further complicated by the evident fact that both Plato and Aristotle rejected Democritus’s worldview in all its fundamentals. Plato incorporates myths into his dialogues and portrays Socrates as philosophizing about the *forms* or *ideas* throughout his life, while Aristotle elevates the prime mover to the object of first philosophy and specifies this being as the final cause of all entities. Aristotle explicitly attacks Democritus;⁴¹ perhaps even more derisively, Plato

39. McKirihan, *PBS*, 62: “. . . Xenophanes does not question the presence of the divine in the universe, only the way it was conceived. His attacks imply that god is not immoral or responsible for evil, is not anthropomorphic, is eternal, self-sufficient, independent and master of everything, and unmoving.”

40. Aristotle, *Metaphysics* Γ.4.1000a18–19. The broader context of this passage, i.e. Γ.4.1000a5–1001a1, makes clear that Aristotle sharply distinguishes between “mythologists,” i.e. poets such as Hesiod, from those whom he considers early philosophers and scientists, e.g. Empedocles, despite the latter’s use of mythical language and poetic diction.

41. Indeed, while Aristotle discusses Democritus’s view on certain aspects of his physical

never allows one of his characters to utter Democritus's name. Thus, in its most extreme interpretation, Democritus's theory brings to completion the Presocratic phase of philosophy, since it implicitly condemns of all his predecessors, whom he viewed as still mired in traditional, albeit modified, versions of religion and driven to exaggerated conceptions of rationality as a result.

V. THE PRESOCRATIC LEGACY

Inevitably each generation sees the Presocratics through a historical lens shaped and reshaped by the interposing thinkers who have appropriated and transformed the thought of the Presocratics for their own uses. And as we know, the greatest of philosophers have their own agendas and visions to articulate and are not always the most reliable historians of ideas. Our own predicament in the "modern" age is further complicated by the overlay of two epochs of Christian civilization in late antiquity and the Middle Ages, as well as the breakdown and rejection of that worldview in the Enlightenment and its wake. As Etienne Gilson describes it:

In its broadest sense, what we call Western culture is essentially the culture of Greece, inherited from the Greeks by the Romans; transfused by the Fathers of the Church with the religious teachings of Christianity, and progressively enlarged by countless numbers of artists, writers, scientists and philosophers from the beginning of the Middle Ages up to the first third of the nineteenth century.⁴²

But if modernity is a self-conscious break from "the past," then its struggle must include, at least as a rhetorical tactic, the attempt to characterize classical philosophy as a usurpation and hegemony, and clearly the systems of thought arising out of the works of Plato and Aristotle, being the classical sources for the *perennis philosophia*, must necessarily be central occasions for waging the modern revolution. From this point of view, the Presocratics are not a group of thinkers whose significance lies in paving

theory, such as the void, he does not appear to have taken his atomism to be a substantial contribution to physics. Aristotle makes clear that Democritus proposes an "infinite" number of principles or elements (see *Physics* A.2.184b21 and Γ.4.203a20), and he rejects this as unscientific: "But neither can there be an infinite number of first principles. In that case, "being" would be unknowable" (*Physics* A.6.189a11–14).

42. Gilson, *Unity of Philosophical Experience*, 218–19.

the way for the Platonic and Aristotelian worldviews. To the contrary, the Presocratics come to represent an early, more authentic philosophical tradition that is first to fall victim to the errant metaphysical systems of the Athenians. The Presocratics thus become evidence of the possibility of philosophy apart from Plato and Aristotle and so too apart from the Church.

As John McCarthy notes, Francis Bacon stands among the great proselytizers of modernity, one who was “not merely an eloquent herald and apologist, but also, if we are to take him at his word, its philosophical founder.” At the core of the classical conception of philosophy is the superiority of theory, that is, the life of learning and contemplation, to man’s practical and productive activities. The moderns wished to invert this ordering, seeing the philosophy of the schoolmen as essentially sterile and oriented more toward things as they should be rather than things as they are. McCarthy notes that a “primary incentive for Bacon’s return to the dawn of Greek philosophy is to enlist its help in a campaign, waged over the entire course of his adult life, to discredit the philosophy of Aristotle.” But, again, rather than a direct frontal assault on Aristotle and the philosophy of the schools so heavily indebted to him, Bacon indicts Aristotle with the charges of an ahistorical approach to his predecessors, of twisting and deforming their teachings to suit his own ends. In short, he indicts Aristotle of accomplishing in his day the sort of philosophical revolution that Bacon wishes to effect in his own—of course, with respect to different doctrines, but with similar argumentative and rhetorical tools.

In his own fashion, Bacon advances the modern program of liberating mankind from ignorance and superstition through the vehicle of technological advancement. It follows then that the earlier, prevailing models of knowledge were unwittingly mired in common opinion and thus error, albeit unwittingly. As McCarthy points out, it was the methodology of the ancients, or rather their lack of it, that guaranteed the failure of their attempts at knowledge: “According to Bacon’s analysis in the *Novum organum*, the root problem with the natural philosophy of Socrates’s successors is precisely its ‘Socratic’ character . . .” In the case of the Platonic Socrates, this meant the attempt to advance from common opinion, or “δόξαι,” through dialectic, that is, conversation and argument, to the principles of knowledge, the forms. In the Aristotelian

works, this advance toward first principles, or ἐπαγωγή,” begins with the prominent opinions (ἔνδοξα) and progresses toward an immediate, intellectual grasp of them. In either case, the points of departure are “what is first for us,” with the assurance that these beginning points somehow reflect and sufficiently point the way to what is “first by nature.” In Bacon’s view—and it is the consensus of modernity—this is a false portrait of knowledge, which, persuading us that the qualitative steps toward knowledge can be made systematically, papers over the fact that the ancients “flew up to the most general conclusions” on the basis of scant and therefore faulty evidence.

McCarthy argues that, among Aristotle’s philosophical precursors, one finds at least the inklings of a better, more genuine conception of knowledge: one in the writings of Democritus, whose “similes reflect the distance separating philosophical understanding from common opinion far more accurately than any syllogisms ever could,” and the other, Pythagoras, who also “identified as a principle of nature what he himself is prepared to count among the ‘essential forms of things’, and specifically, a ‘mathematical form’ that is also a ‘natural form.’” Not that Bacon wholeheartedly endorsed the teachings of these Presocratics, but only that their lives and works represented a possible, though unactualized, historical alternative to Plato and Aristotle.

The project of modernity succeeded in the sense of overthrowing the philosophy of the schoolmen, the authority of Plato and Aristotle, and, as well, the political and religious institutions of *ancien régime*. By the middle of the eighteenth century, however, it was clear to thinkers like Rousseau and Kant that the new science and the new *Weltanschauung* that grew out of it provided an inadequate basis for ordering social life and replacing religious belief. Modernity has thus become characterized less by a sense of optimism and the claims to self-evidence and rationality than by a sense of crisis, of being caught between an irrecoverable past and untenable future.

Modernity begins therefore with an ambivalent relation to antiquity: while generally holding the past to be largely a scene of superstition and prejudice, it has also sought precursors and precedents in antiquity for the sorts of innovations it hopes to effect—the turn toward classical paganism during the Renaissance, the plethora of claims to restore the Christianity of the Apostolic generation in the Reformation, the rejec-

tion of classicism and a turn to strands of pre-classical philosophy in the Enlightenment. Reactions to the demise, or at least the teetering, of modernity have thus tended to intensify this return to the past as a kind of attempt to diagnose the crucial moment in history that predetermined the rise, decline, and fall of the Enlightenment and to determine a remedy that may return us to the healthier forms and models that existed before that time.

As Richard Velkley points out in his essay, Friedrich Nietzsche and Martin Heidegger number among the greatest interlocutors with both the legacy of the Greeks and the fallout from the modern break, and both thinkers see in the breakdown of modernity the seeds of a recovery of a true cultural rebirth in which philosophy will play an integral part. For Nietzsche as well as for Heidegger, Socrates (at least as we know him through Plato) “inflicted the fatal wound” on the tragic culture of the Greeks with a moral and rational interpretation of human existence. The Presocratics therefore represent the true spirit of the Greeks, whose philosophical remains are windows into the great and dynamic soul of the sort emulated and permitted to flourish in the Hellenic world and embodying the joyful fatalism, self-affirmation in the face of genesis, and the indifference to nature that constituted the pinnacle of Greek excellence.

If Nietzsche seeks a kind of spiritual or psychological renewal of modernity through a revived appreciation of the ancients, he does not think that philosophy is the major force in this renewal. The Presocratics are examples of the superior types and thus they intimate the superior culture, but they are only occasions for us to reexamine this culture and how it emerged. Martin Heidegger, by contrast, locates philosophy as the principal agent in the new epoch of history and culture that necessarily corresponds to a new disclosure of the meaning of Being. For Heidegger, a propaedeutic to the recovery of the meaning of Being is a “destructuring” of the traditional notions of Being that both allows some understanding of it and obscures it at the same time. Given this approach, the Presocratics take on a world-historical significance, as Velkley says: “In the history of Being two moments are most decisive: the original opening to Being among the Greeks at the beginning (*Anfang*), in the first questioning about Being, which founds a destiny that carries forward Western history, and the present moment, that of oblivion to the ques-

tion of Being, or nihilism, which completes the process of forgetting.” To renew the question of Being implies, in part, to return to the beginning, not as a purely historical investigation, but to recover the meaning that is there always before us though obscured and half forgotten. A study of the Presocratics reveals not only an originary encounter with Being opening up within our cognition of objects or beings; it also reveals our errant and deforming comprehension of it that occurs almost immediately. According to Heidegger, “Already at the dawn of thinking about Being, the essence of Being as the presencing of beings keeps to itself, and so the difference between Being and the beings themselves, the things that are present, remains concealed.”

We do not expect from Nietzsche and Heidegger, or from Francis Bacon for that matter, a detached scholarly account and reconstruction of Presocratic thought. Yet their appropriation of the Presocratics for their own purposes attests to the ongoing value of these individuals in the philosophical tradition of the West and as occasions for philosophical thinking to occur. Connected to the fundamental notions of nature, principle, cosmos, etc. is a notion of man’s place in a whole of which he has only intimations, but not knowledge proper. The Presocratics thus show us that philosophy will always involve debates about the nature of the whole precisely because our powers to comprehend it always fall short. And yet it is only through these failed attempts to articulate the nature of the whole that we cultivate our awareness of it.

The course of Presocratic philosophy thus can be read as debate over philosophy and reason itself, and in this respect at least, the relative dearth of Presocratic texts is salutary. Fundamental positions are not obscured by whole systems, but the kernel of each thought can be more clearly seen in its purity. The cycle of affirmation of doctrine, critique, and reintegration of previous insights into new doctrine, which is the recurrent theme in the story of philosophy in the West, can be seen in its pure and original form in the Presocratics.

Early Greek Philosophy

1 ∞ The Achievement of Early Greek Philosophy

A Drama in Five Acts: From Thales to the *Timaeus*

ACT 1: FROM HESIOD TO THE MILESIANS

I want to survey with you the achievement of early Greek philosophy in the period from Thales to the *Timaeus*. I am old fashioned enough to believe that this was a unique and momentous event, the like of which has never happened elsewhere, before or since. The event in question is nothing less than the creation of Western science and philosophy as we know them. The closest parallel, perhaps, is the creation of modern science and philosophy in the seventeenth century, beginning with Galileo and Descartes. What is distinctive of philosophy in the West, from the sixth to fifth centuries B.C. and again in the seventeenth century A.D., is that philosophy took shape together with mathematics and natural science. In each of these periods, prominent individuals were active in both the scientific-mathematical and also the more strictly philosophical area—like Anaxagoras and Democritus in antiquity, and Descartes and Leibniz in the modern counterpart. In both periods, it was an age of immense intellectual creativity. But the Greek achievement is the more amazing, because they were doing it for the first time.

The first chapter in my story—shall we say, the first act in this intellectual drama—is the momentous shift from the mythic-poetic world of Hesiod's *Theogony* to the new world view created by the Milesians in the sixth century. My theme here is a familiar one: from *mythos* to *logos*, from mythopoeetry to a rational account of nature.

The new enterprise began in the sixth century B.C. with a group of

intellectuals around Thales and Anaximander, who set out to do what came to be called *peri phuseôs historia*, inquiry into the nature of things. Thus some of the early treatises were entitled *peri phuseôs*, the title echoed in Lucretius's Latin version: *De Rerum Natura* (*On the Nature of Things*). We do not know exactly when this terminology came into use. Whatever the date of origin, this formula, *peri phuseôs historia*, provides an appropriate name for the tradition of natural philosophy that begins in sixth-century Miletus and represents something new: an attempt to understand the phenomena of nature in purely physical or mechanical terms, without magical powers, without monsters, and without anthropomorphic gods. If we compare the austere Milesian cosmogony, as reported for Anaximander and Anaximenes, with the rich and dramatic narrative of Hesiod's *Theogony*, we can easily see what has been left out. Gone is the coupling of Ouranos and Gaia, gone the emasculation of the father by Kronos, gone the battle between Olympian gods and Titans. Not so easy to see is what has taken the place of all this conflict and personification present in the mythopoetic world view. I suggest that the fundamental innovation is the concept of nature itself, the notion of *phusis*—as presupposed, for example, in the motto of Heraclitus: “nature loves to hide” (*phusis kruptesthai philei*).¹

Thus the term *phusis* stands for a conception that is distinctively Greek, and subsequently Western, namely, the conception of a natural order of things, a *kosmos* “which no man or god has made” (B30), to quote Heraclitus again. Both terms, *phusis* and *kosmos*, are conspicuous in his fragments, which are our oldest prose documents for the new world view. Together with *kosmos*, *phusis* represents this positive conception of an order of nature that is self-grown, like a plant (hence the etymology from *phuesthai*, “to grow”). The negative move by itself, the escape from mythopoetry and from the personification of natural powers, is not unique to Greece; one finds parallels, for example, in the creation story from Genesis. In the Bible account, as in Milesian cosmology, the personified spirits of nature like Gaia and Ouranos have been elimi-

1. In their comparative study of ancient Greek and Chinese science, *The Way and the Word*, Geoffrey Lloyd and Nate Siven point out that the Chinese, who did plenty of mathematics and astronomy, did not have a word for “nature” until the end of the nineteenth century, when they needed to invent a word—or make a new use of an old term—in order to translate Western texts.

nated. But what is lacking in the biblical version is precisely this positive conception of a natural order that is self-contained and independent of supernatural causation.

So the first and greatest achievement of early Greek philosophy is precisely this concept of the world as a *kosmos*, that is, as an order that is given “by nature,” by *phusis*, independent of human and divine art, the order that no man or god has made, but that is nevertheless available for understanding. No one has made it, but humans can try to figure out how it works. That is the Greek perspective. The first expression of this view known to us is the cosmology of Anaximander. Anaximander was the first to offer a mechanical explanation of eclipses, thunder and lightning, as well as a semi-mechanical, semi-biological explanation for the origin of heaven, earth, and sea. His fellow Milesian, Anaximenes, goes a step further and explains the transformation of fire, air, sea, and earth into one another by a process of thickening and thinning, condensation and rarefaction.

In addition to mechanical explanations, what appears in both these theories, but most strikingly in the cosmology of Anaximander, is the idea of a geometric model for the heavens and for the movement of the heavenly bodies. The Babylonians had studied these movements with great care, and had accurately plotted the periodic path of the sun, moon, and planets among the stars. But they understood the visible motions of celestial bodies not in terms of geometry and mechanism but as the intentional activity of the gods. (It is no accident that the planets were named Zeus, Ares, and Aphrodite, and hence Jupiter, Mars, and Venus, after their Babylonian equivalents.) Astronomical knowledge was important for pre-Greek civilizations because it revealed the intentions of the gods. But the astronomy of the Babylonians provided prediction without explanation. By proposing, for the first time, a geometric model for the visible movement of the heavenly bodies, Anaximander (or perhaps some other Milesian not named in our sources) made astronomy in the modern sense, that is, as an explanatory science, possible.

The details of Anaximander’s cosmic model seem to us childish and primitive. Thus the eclipses of the moon were produced by a circular vent of celestial fire that periodically opens and closes. But, as Karl Popper might have pointed out, Anaximander’s scheme was at least falsifiable, and it was quickly corrected. Within a generation or two, by the time

of Parmenides, it will be known that the moon borrows its light from the sun. This is a crucial discovery. One generation later Anaxagoras will give the correct explanation of lunar eclipse. Such was the rapid progress of observational astronomy within the first hundred years of the new world view.

There is a second, equally momentous innovation that seems to have occurred about the same time, in this first century of Milesian or Ionian proto-science, although in this case our documentation, and hence our dating, is very weak. I am referring to the notion of mathematical proof in its basic form, requiring a clear distinction between premises that are accepted without argument and inferences that are logically derived from these premises. The first explicit mention of this idea comes much later, with Plato's discussion of the method of hypothesis in *Meno* (86d–87c) and *Phaedo* (99d–101e). But Plato tells us he is borrowing this method from the mathematicians, and we have every reason to believe him. Nevertheless, the earliest surviving example of this form of argument, where the premises are clearly marked and distinguished from the conclusion, is found in a philosophical document, in the poem of Parmenides. Parmenides too must have been following a mathematical model. But unfortunately we have no mathematical texts from this early period (around 500 B.C.). All we have is the much later, indirect evidence from the summary of Eudemos's *History of Geometry* preserved by Proclus, which attributes several elementary theorems of geometry to Thales in the early sixth century. The attribution to Thales may be legendary rather than historical, but it can be taken as symbolical for this third great achievement of archaic Greek thought, the notion of mathematical proof. All we can say with confidence is that this notion was introduced by someone between the time of Thales and that Hippocrates of Chios, and almost certainly before Parmenides, that is to say, probably in the sixth rather than the fifth century B.C.

In summary, we can attribute three great achievements to this first act in our five-act drama, the period of Miletus in the sixth century: the creation of the idea of nature and a natural cosmos; the geometric model for the heavens above and the earth below, and the idea of mathematical proof. We might add as a fourth achievement the attempt to give a mechanical explanation for natural phenomena such as eclipses, thunder, and lightning.

ACT 2: FROM THE MILESIANS TO HERACLITUS
AND PARMENIDES

By the end of the sixth century the new world view is well established in Ionia, at least among an intellectual elite, and it is beginning to radiate out from Miletus. The first expansion is marked by the geography of the earliest names: Pythagoras of Samos, Xenophanes of Colophon, and Heraclitus of Ephesus. Samos, Colophon, and Ephesus are all close neighbors of Miletus. But Pythagoras and Xenophanes migrate to the West, to Italy, together with a vast number of Greek refugees from Lydian and Persian rule, and in the next generation we find philosophy settled in South Italy, in Elea, in the person of Parmenides and his follower Zeno.

Heraclitus and Parmenides represent the second wave (or second act) of Presocratic philosophy. What Heraclitus and Parmenides have in common is that they can take for granted the new proto-science developed in Miletus; hence their own thought forms a kind of commentary on this new naturalistic world view. In this sense, the philosophical position of Heraclitus and Parmenides is second order: it takes as its first-order object the new Ionian cosmology. The cosmologists of the following generation, beginning with Anaxagoras, will again be first-order theorists, since they will all resume and continue the Ionian tradition of explaining natural phenomena directly, once they have absorbed the impact of Parmenides. But Heraclitus and Parmenides are not physicists in the usual sense, for they are not interested in providing new explanations of natural phenomena. (This is true for Parmenides in the first part of his poem.) They are interested in applying this new world view either to a new understanding of human life, in the case of Heraclitus, or, in the case of Parmenides, to a new conception of knowledge and reality.

Pythagoras was probably the first of these second-order theorists, thinkers who exploited the new world picture for their own purposes. He seems to have interpreted the Milesian notion of *kosmos* within the framework of his own conception of musical *harmonia* and then to have used this new doctrine of cosmic order as the ideological basis for the socio-religious community—the Pythagorean brotherhood—that he created in south Italy. The facts are contested, but this is my own best guess as to the Pythagorean contribution to early Greek philosophy: a reformulation of Milesian cosmology in terms of musical harmony and

proportion. It is easier to understand the form that philosophy takes for Heraclitus and Parmenides if they both have before them the model of a Pythagorean interpretation of the new cosmology. But in the absence of early Pythagorean texts, this can be no more than speculation.² What is better documented for the early period is the use made of the new proto-science by Xenophanes, who relies on a naturalistic world view in order to attack the Homeric conception of the gods. He would replace this poetic picture of the gods as quarreling, adulterous personalities with the earliest known rational theology. Xenophanes presents the earliest Greek conception of a cosmic god, non-anthropomorphic in form and responsible for the order of nature.³

Heraclitus and Parmenides are the two giant figures who dominate my second act, this second wave of philosophers in the late sixth or early fifth century. Of all the Presocratics, Heraclitus is probably the one who speaks most directly to us as modern readers. If we substitute our science for his, we can take the suggestiveness of his images and the rich ambiguity of his language as a commentary on our own predicament. Writing in prose, like the Milesians, Heraclitus exploits the literary framework of a *logos* tradition, a tradition of wise men and wise sayings, embracing both the new naturalistic science and the older, more popular authorities (like Homer and Hesiod) whom the naturalists seek to replace. Heraclitus adopts an aphoristic style from this tradition of *logoi* or storytelling, the tradition that Hecataeus of Miletus makes fun of, when he says, “The *logoi* of the Greeks are many and ridiculous” (fragment 1 [Jacoby]).⁴ This also includes the tradition of the *logioi* or informants of Herodotus, the wise men of Persia who have stories to tell about the ancestral hostility between the Greeks and their eastern neighbors. Heraclitus begins by announcing his own *logos*, in contrast to all the *logoi* he has heard. His own *logos* is true forever, although forever misunderstood. It is a *logos* both about the world order (“All things come to pass according to this *logos*” [B1]) and also about the human soul (“You will never come to the limits of the soul if you travel every way, so deep is its *logos*” [B45]). Heraclitus has thought about physics, but also about life and death. He has in-

2. Our first Pythagorean texts are the fragments of Philolaus in the second half of the fifth century.

3. E.g., fragments DK 21B11, 12, 14, 15, 23, and 34.

4. Jacoby, *Die Fragmente der Griechischen Historiker*.

vestigated the nature of things, but he has also investigated himself. And he has found that the order of nature is also the order of his own soul. So in a sense Heraclitus remains within the naturalistic tradition, but he integrates the new conception of nature into a larger view of the meaning of life and death. Heraclitus thus presents the earliest and probably the deepest reflection on the microcosm-macrocosm analogy.

The position of Parmenides is more complex, both because of the opposition between the two parts of his poem and because of his profound influence on the later acts of our drama. In the long run, it is Parmenides's account of Being (in Part One of the poem) that serves as the point of departure for the metaphysics of Plato and Aristotle. But initially, in the fifth century, it is Parmenides's physical theory, the doctrine of elements outlined in Part Two of the poem, that provides the pattern for Anaxagoras, Empedocles, and the atomists. It is Parmenides who introduces the very concept of element, that is, the project of explaining the world of change by the mixing and unmixing of fundamental constituents that are themselves immune to change.

Parmenides presents this theory of two elements, Fire and Night, in the context of a detailed cosmology of the Milesian type, but a cosmology with distinctive features (such as a reference to transmigration) that mark it as belonging to the Western or Pythagorean tradition. Because of our almost total ignorance of this Western tradition before Parmenides, it is impossible for us to evaluate the degree of originality in Parmenides's own cosmology. I assume that the old Cornford-Raven attempt to reconstruct an earlier Pythagorean view—a view against which Parmenides would be reacting—no longer has any supporters. The illusion of this early Pythagorean doctrine, constructed by inference from Parmenides's text, has been, I think, totally destroyed by the work of Walter Burkert. We must simply accept the fact that Parmenides's cosmology is the earliest known example of the Italian tradition.

We can only guess how much of his own life Parmenides had devoted to the study of nature and how much of his cosmology he has simply taken over from his unknown predecessors. The striking fact is that his poem is the first Greek text to report two important scientific discoveries. One discovery is to identify the Morning Star with the Evening Star, in other words to recognize the planet Venus.⁵ This identity

5. Stobaeus, *Anthology* I xxiv 2e, as quoted in Barnes, *Early Greek Philosophy*, 89.

had been known in Babylon for many centuries, but it was unknown to Hesiod, and it is not mentioned in any Greek text before Parmenides. Parmenides's other innovation is more momentous: he recognizes that the moon's light is dependent on light from the sun.⁶ This is practically equivalent to recognizing that lunar eclipse is due to the shadow of the earth—a discovery usually attributed to Anaxagoras. Was Parmenides himself practicing observational astronomy? Is he personally responsible for either of these scientific breakthroughs? We simply do not know. But we can recognize that, if Parmenides himself was not doing original work in astronomy, he was at least acquainted with the best knowledge of his time. To that extent, Part Two of his poem represents a genuine contribution to early Greek natural philosophy or proto-science. Nietzsche once suggested that Parmenides in his early years was a student of astronomy and physics and had worked out his own cosmology, before undergoing something like a metaphysical conversion to the higher knowledge of Being.⁷ This is an attractive story, since it accounts for the extensive development of physical theory in the second part of the poem.

Nevertheless, Parmenides denies the attribute of truth to this elaborate cosmology, which has been demoted to "The Way of Opinion." Thus Parmenides continues to pursue natural philosophy, but only as the way of *doxa*, defined by contrast with the way of Truth, which is the way of Being. This Truth-versus-*Doxa* dichotomy provides Parmenides with an epistemic framework within which the Ionian cosmology can be reinterpreted. Seen within this framework, what we call science or proto-science is no more than deceptive appearance, "the opinions of mortals." Parmenides's cosmology is intended to be the best of its kind, "so that no view of mortals will ever surpass" it (B8.61). Despite its powerful structure as the first element theory and its rich empirical detail, this cosmology is presented only as an unreliable "opinion of mortals"; its exposition is described as no more than a "deceptive ordering (*kosmos*) of verses" (B8.52), in a punning reference to Parmenides's presentation of the physical *kosmos*.

It lies beyond the scope of the present occasion to give an account of Parmenides's doctrine of Being and of the argument by which it is artic-

6. See fragments DK 28B14 and 15.

7. Friedrich Nietzsche's *Philosophy in the Tragic Age of the Greeks*, sec. 9.

ulated. Suffice it to say that it is by this argument that Parmenides initiates the Western tradition of philosophy proper, as distinct from astronomy and proto-science, and distinct also from wisdom literature. It is in virtue of this argument and its consequences that Parmenides and his pupil Zeno, alone among the Presocratics, would be obvious candidates for membership in a modern philosophy department.

ACT 3: THE COSMOLOGIES OF ANAXAGORAS,
EMPEDOCLES, AND DEMOCRITUS

With Anaxagoras, Presocratic philosophy returns to business as usual: *peri phuseôs historia*, an account of the natural world in the tradition of Miletus. But although these fifth century cosmologies continue a traditional enterprise, they feel obliged to provide this enterprise with new foundations, with an element theory designed to answer the critique of Parmenides and Zeno. On the one hand, Anaxagoras and the atomists are in the direct line of the Ionian tradition, and for many details their doctrines resemble those of the Milesians. Empedocles, on the other hand, comes from the West, and he (like Parmenides) is influenced by a theory of the soul that is in a broad sense Pythagorean. But in each of the three fifth-century cosmologies, their novelty consists primarily in what Aristotle calls the *archê*, the starting point of their system, that is, in the account each one gives of elemental principles that can escape Parmenides's attack on coming-to-be and passing-away. In other respects, Anaxagoras, Empedocles, and the atomists are genuine practitioners of the Ionian enterprise of explaining the nature of things in quasi-scientific terms. Thus, as we have seen, the correct explanation of lunar eclipse makes its first appearance among the *testimonia* for Anaxagoras.

The element theory of Anaxagoras seems to be inspired by the desire to absorb and survive the Zenonian idea of repeated bisection. (You recall the Zenonian arguments to show that you cannot move from A to B because you must first pass through C and D, and again through an endless number of additional midpoints.) Hence, according to Anaxagoras, by being continuously cut into smaller and smaller pieces, everything will go out of sight but not out of existence. Every visible object will thus consist of a mixture of infinitely many, infinitely small seeds or portions of different kinds. Everything has a portion of everything. The

phenomenal properties of macroscopic things are simply those microscopic portions which are most numerous in any specific mixture. Anaxagoras's theory has no follow-up, no afterlife in Greek thought, because it was seen to have no explanatory power.⁸ Although these tiny seeds or bits satisfy the Parmenidean requirement of permanent existence—they neither come to be nor perish—they do not reduce the infinite variety of phenomenal properties to any more manageable set of elementary principles. They simply reproduce at the microscopic level all the phenomenal diversity of ordinary things. Hence this was not a theory destined to attract supporters in the long run.

As Aristotle emphasized, Empedocles had a better theory. Empedocles is responsible for the classical doctrine of elements, identifying earth, air, fire, and water as the basic building blocks of the world. The success of this theory was guaranteed first by Plato's adopting it in the *Timaeus* and then by Aristotle's perfecting it in a neat pattern, according to which each element includes one member of each of the two pairs of qualitative opposites: hot-cold and dry-wet. In this form, the doctrine of four elements persisted through two millennia, unchallenged until the birth of modern chemistry in the eighteenth century. Because of the poetic quality of Empedocles's text, many quotations have survived, and we have a fuller picture of Empedocles's cosmology than of any other Presocratic theory. Empedocles's system has many fascinating features, of which I mention only two aspects of the cosmic cycle oscillates back and forth between: first, the unity of total fusion in a universal sphere, and second, the opposite pole of multiplicity, where the four elements are completely separated from one another. Driving these two opposite movements are the two cosmic forces of Love, or attraction, and Strife, or repulsion. The world picture of Empedocles thus combines poetry and mechanism in a system of great power.

It is Democritus and the atomists, however, who produce the cosmic scheme that most fully anticipates the world view of modern science. This is not a historical accident, since the modern view was profoundly influenced by the version of atomist theory presented in Lucretius's poem *De Rerum Natura*. The essential feature of the atomist view is a purely mechanical account of invisible elementary particles, solid bodies

8. See, e.g., *Phaedo* 97b–99d.

of various shapes, devoid of qualitative properties such as hot and cold, wet and dry. As Democritus said, “by custom (*nomos*) there is hot and cold, by custom sweet and bitter, by custom there is color; in truth there are atoms and void” (B9; cf. B125). Democritus thus accepts Parmenides’s epistemic dualism, opposing the world of appearance to the true world as described by science (or proto-science). It was this purely mechanistic view of physical reality that was taken over by Galileo and Descartes in shaping the modern scientific world view in the seventeenth century. The Parmenidean duality between appearance and reality, or between custom and truth, is precisely paralleled by the famous modern distinction drawn by the physicist and philosopher Eddington between the table in front of him as he lectures,⁹ that is, the table he perceives, which is characterized by phenomenal properties such as color and solidity, and the table described by physics that possesses none of these properties. According to Eddington, only the table described by physics is really there. The same distinction was generalized by Wilfrid Sellars in his contrast between the Scientific Image and the Manifest Image.¹⁰ On this interpretation, modern science, like ancient atomism, is faithful to the epistemic dualism represented by the two parts of Parmenides’s poem: scientific truth versus mortal opinion.

More specifically, ancient atomism prefigures modern physics by the pure mechanism of its causal account. The atoms have only geometric properties; they differ only in shape, position, and combination. Above all, they are indivisible, that is, immune to Zenonian bisection. It is this absolute solidity that gives them their name—“*a-toma*,” i.e. “uncuttables,”—and that guarantees their Parmenidean freedom from coming-to-be and passing-away.

ACT 4: THE SOCRATIC-PLATONIC TURNING AWAY FROM NATURAL PHILOSOPHY

The atomist system is the culmination of the cosmological tradition that began in Miletus more than a century earlier. For Plato it presents the

9. See “Introduction” in Eddington’s 1927 Gifford Lectures, published as *The Nature of the Physical World*.

10. See Wilfrid Sellars’s “The Scientific Image of Man.”

most threatening form of this tradition, because of its rigorous materialism and the consequent denial of any rational governing principle and the rejection of anything corresponding to *nous* in Anaxagoras or to Aphrodite or Love in Empedocles. According to the atomists, the cosmos is produced solely by *anankê*, that is, by mechanical necessity—by the chance collision of atoms moving perpetually in random motion. Plato will eventually respond in the *Timaeus* with a cosmology designed by an artisan god who overcomes Necessity by making everything in nature as good as possible.¹¹ In his earlier work, however, Plato will abandon the philosophy of nature entirely and pursue a new line of inquiry and a new conception of philosophy opened up by Socrates.

This new departure begins with Socrates's search for a different kind of wisdom, the knowledge of virtue (*aretê*) or what makes a human life a good life. In Plato's *Apology*, Socrates acknowledges his lack of expertise in physics, that is, in the study of "things aloft and things under the earth," but he insists upon his great respect for such knowledge, "if there is anyone wise in these matters" (*Apology* 19c). Thus Socrates's attitude to natural philosophy in the *Apology* is one of ignorance and respect. Socrates's position in the *Phaedo* is interestingly different: there he reports his youthful passion for natural philosophy, his eagerness to study the writings of Anaxagoras, but also his disappointment with Anaxagoras and his decision to pursue a different mode of philosophy as a second best, a *deuteros plous* (see *Phaedo* 97b–101e). In the *Phaedo*, this alternative method in philosophy is called "the art of *logoi*," what in the *Republic* and in later dialogues is called dialectic. If the suggestion that dialectic is a second best is taken seriously, this implies that the first best would be a cosmic theory that could display the full causal and explanatory power of the good. For that is what the Platonic Socrates found lacking in Anaxagoras and the naturalists.¹²

The *Republic* pursues the Socratic concern with a good human life, developed within a distinctively Platonic political framework. The Form of the Good appears here as the intellectual sun, radiating through the intelligible realm of Forms. It provides the ultimate object of study for philosopher-kings who are to become good rulers and so are able to make the city and the citizens good in turn. It is in the training pro-

11. See *Timaeus* 28b–29a.

12. See *Phaedo* 99c.

gram for philosopher-kings that Plato returns to the study of astronomy and the other mathematical sciences that originally formed part of (or were closely associated with) the study of nature. In the *Republic*, however, Plato is concerned with astronomy not as a part of *peri phuseôs historia*, the investigation of nature, but rather as a preparation for the mind whose goal is, in effect, to escape from nature and from becoming in order to attain to a purely intellectual grasp of Forms. It is not observational astronomy that the guardians must study, but astronomy conceived as a branch of pure mathematics. In the *Republic*, as in the *Phaedo*, it is only in the concluding myth that cosmological interests reappear—for example, in the astronomical framework for the myth of Er at the end of the *Republic* (614b–621d) or the myth of judgment at the conclusion of the *Phaedo* (107c–115a). In both dialogues, cosmology is relegated to the final myth, because Plato has not found a place for the study of nature in his philosophical doctrine proper. That will change in later dialogues, beginning with the *Phaedrus*.

ACT 5: PLATO'S RETURN TO THE PHILOSOPHY OF NATURE

Socrates's complaint in the *Phaedo* was that Anaxagoras had not explained how the concept of the Good could play a dominant role in cosmology. Socrates wanted to be shown how the principle of “the good and the fitting (*to deon*)” could “bind all things together and sustain them” (*Phaedo* 99c). Seen retrospectively, this passage from the *Phaedo* reads like a promissory note, a note to be finally paid in the teleological scheme of the *Timaeus*. For it is in the cosmology of the *Timaeus* that Plato carries out the project of showing the explanatory and causal power of the Good. He does so again within the literary context of a myth. For the semi-mythical figure of the creator god or Demiurge plays an essential role in this teleological scheme. But the status of the mythical element is now quite different. In the *Timaeus*, Plato has succeeded in locating the quasi-mythical narrative of creation within the broader framework of his systematic epistemology. Although in the anthropomorphic figure of the Demiurge, Plato's cosmology remains semi-mythical, it has now been integrated into philosophy proper. The integration is accomplished in the methodological prologue by which the cosmology is introduced.

Concerning the stable and unchanging paradigm of the Forms, says Timaeus, our account should be as rigorous and irrefutable as possible (see *Timaeus* 29b–c); but concerning the changing *image* of the Forms in the realm of nature, we must be satisfied with less—with a “likely story (*eikôs muthos*)” (*Timaeus* 29d) or a “plausible account (*eikôs logos*)” (*Timaeus* 30b). Thus cosmology is now admitted into the framework of Platonic philosophy, on the basis of an epistemic dualism inherited from Parmenides. Dialectic is not really a second best, as the *Phaedo* had ironically suggested. On the contrary, what Socrates called the method of *logoi* is the authentic philosophical path to the Forms, and ultimately to the Good itself. Thus the method of dialectic corresponds for Plato to the true path of Parmenides, the path that leads to Being. For Plato this path leads to the Forms, and ultimately to the Good. It is perhaps an implicit correction of Parmenides when, in the *Republic*, Plato adds the famous and mysterious claim that the Good lies “beyond being (*epekeina tês ousias*)” (*Republic* 509b). The primacy of the Good is a new thought, a Socratic revision and enrichment of the ontology inherited from Parmenides.) As the Forms for Plato correspond to Parmenidean Being, so the cosmological theory of the *Timaeus* corresponds to the account of nature in Part Two of Parmenides’s poem. The text of the *Timaeus* is full of Parmenidean echoes. Thus the cosmology is to be welcomed “if the account we offer is inferior to none” (*Timaeus* 29c and 48d), which echoes DK 28B8. And the two levels of cognition are related proportionally to the two levels of reality: “As being stands to becoming, so stands truth to belief (*pistis*)” (*Timaeus* 29c). Of course, Plato is not a slavish follower of Parmenides. He is a revisionist Eleatic, as the *Sophist* shows in its positive account of Not-Being. In updating Parmenides, Plato has not only rehabilitated Not-Being as the form of negative predication; he has also elevated Becoming to the status of partial reality. Hence the epistemic dualism of the *Timaeus* is much more coherent than the dichotomy between the two parts of Parmenides’s poem. Timaeus is able to do what Parmenides apparently cannot do, namely, attribute a positive cognitive value to cosmology, even if cosmology remains inferior to dialectic and to the knowledge of Forms.

The *Timaeus* is the conclusion of a development in Plato’s thought that begins, as we said, in the *Phaedrus*. The *Phaedrus* introduces a new conception of the soul and a new version of dialectic, both of which point

in the direction of natural philosophy. We have first of all the definition of the soul as the *archê kinêseôs*, the source and principle of motion. This conception prepares the way for Aristotle's definition of nature in the *Physics*, which makes use of precisely this same terminology: *archê kinêseôs*. The *Phaedrus* also introduces us to the notion of dialectic conceived in terms of Division and Collection—the form of dialectic illustrated in the *Sophist*, *Statesman*, and *Philebus* and presented now as the general method of rational inquiry, the application of reason to any subject matter. Dialectic is now conceived as the source of all scientific knowledge, including the science of nature. In describing this method in the *Phaedrus*, Socrates connects dialectic not with the theory of Forms but with *peri phuseôs historia*, with the philosophy of nature. Scientific rhetoric, he insists, conceived here as applied dialectic, requires philosophy in general and natural philosophy in particular. “All the great arts require idle speculation and natural philosophy (*Pasai hosai megalai tôn technôn, prosdeontai adoleschia kai meteôrologia phuseôs peri*)” (*Phaedrus* 269e–270a). It was because of his contact with Anaxagoras and the doctrine of cosmic Mind that Pericles became a great orator. (see *Phaedrus* 270a). Furthermore, the method of investigating nature is common to scientific rhetoric and Hippocratic medicine (see *Phaedrus* 270b). Both must be capable of studying natures generally, analyzing the nature of the body (for medicine) and that of the soul (for rhetoric), but also “the nature of the whole (*hê tou holou phusis*),” that is, the nature of the universe (*Phaedrus* 270c2).

The contrast here between the *Phaedrus* and the *Phaedo* could not be more striking. Instead of turning away from natural philosophy to study the art of *logoi*, this new conception of dialectic as scientific *logoi* requires the study of natural philosophy as preliminary training. Rather than presenting dialectic as an alternative to Presocratic naturalism, the *Phaedrus* conceives dialectic as a universal art that includes the study of nature as a special case. The *Phaedrus* thus opens the path leading to the *Philebus*, *Timaeus*, and *Laws*, Bk. X. Instead of abandoning cosmology to mythic treatment, as in the *Phaedo*, and treating astronomy only as a branch of pure mathematics, as in the *Republic*, the Plato of the late dialogues will reclaim for his own philosophy all the territory studied by his Presocratic predecessors. Thus, in the survey of different views of Being in the *Sophist*, Plato makes clear that not only Anaxagoras but also

Heraclitus, Parmenides, and Empedocles are to be counted among his philosophical interlocutors. And the Limit (*to peras*) and the Unlimited (*to apeiron*) of the *Philebus* (16b–17a) make a similar point for continuity with the Pythagorean tradition. Thus Plato is systematically re-appropriating the subject matter of his Ionian and Italian predecessors. The appropriation is most fully carried out, of course, in the *Timaeus*. Except in the introductory dialogue that serves as proem, the *Timaeus* has the literary form of a Presocratic treatise, “beginning with the origin of the cosmos and ending with the nature of human beings” (*Timaeus* 27a). Book X of the *Laws* provides a kind of coda or postscript to the *Timaeus*. In one long argument establishing *psyche* and *nous* as the *archê kinêseôs*, the fundamental source of change in the world, Book X of the *Laws* shows how the study of nature has been fully and definitively reclaimed for Platonic philosophy. By means of the *Timaeus* and *Laws*, Bk. X taken together, Plato has purged naturalist physics of the materialist and mechanist tendencies that distorted Anaxagoras’s cosmology—tendencies that came to a head in Democritus’s theory of a world produced by chance collisions between lifeless bodies moving at random.

Plato’s reinterpretation of Presocratic physics was decisive for intellectual thought for the rest of antiquity. The Epicureans were alone in preserving the atomist cosmology. Aristotle and the Stoics continue Plato’s scheme for the teleological structure of nature. Of course, Aristotle and the Stoics have each their own version of teleology; they do not follow Plato blindly. But they follow him on the essential point. Plato had shown how to interpret the order of nature with the principle of Mind or Reason—*nous*—firmly in command, guiding the natural processes toward some conception of the Good. In this respect, the revised scheme of Anaxagoras, as emended by Plato in the *Timaeus* and *Laws*, Bk. X, became the dominant world view throughout antiquity. A similar view prevailed in the Middle Ages and far into modern times, with the biblical God replacing *Nous* and the World Soul as *archê kinêseôs*. I am afraid that we must even recognize a kind of degenerate ghost of this ancient world view in the current ideology which its supporters call “intelligent design.” I do not imagine that Plato and Aristotle would be pleased to see their principles represented in this form today. A philosopher today needs to rethink the whole issue of teleology in the light of Darwinian science, not in opposition to it.

Before closing, let us briefly allude to the heritage of Presocratic naturalism after Plato. The *Timaeus* is the logical conclusion to our drama, to the story that begins with Hesiod and the Milesians, since it provides a definitive account of the natural cosmos. With Aristotle there is a break in continuity. By rejecting cosmogony and insisting on the changeless eternity of the order of nature, Aristotle has abandoned the narrative form of the early Greek world view. From Anaximander to Democritus, the Presocratics had responded to Hesiod's request to the Muses: "Tell us what came into being first, what came afterwards." And the *Timaeus* preserves this narrative frame. Aristotle is perhaps the only ancient philosopher to deny that the order of nature had taken shape gradually, from more primitive beginnings. On the other hand, in the order of his immense project of treatises on nature, beginning with the *Physics* and concluding with the *On Generation* and the *Movement of Animals*, Aristotle has, in effect, preserved the traditional structure of *peri phuseôs historia*, beginning with the general principles of the cosmos and ending with the study of living things. In this perspective, Aristotle is continuing the project of the Presocratics.

With the Stoics we return to the developmental pattern of Presocratic cosmology, with a Heraclitean primacy for Fire and an Empedoclean pattern of cosmic cycles. It might be possible to devote a different lecture to the survival of Presocratic ingredients in Stoic cosmology.

In conclusion, let us recognize the special charm of the Presocratic philosophers: on the one hand, the freshness and youthful power of their enterprise, in trying for the first time to make sense of the universe without relying on any supernatural assistance, and on the other hand, the boldness and rigor with which they pursued their different paths. After the century and a half that separates Democritus from Thales and Anaximander, the world would never be the same again.

2 ∞ Anaximander's *apeiron* and the Arrangement of Time

For Anaximander, the first philosopher of the West, there is extant only one passage in his own words.¹ It is a precious legacy, the oldest piece of Greek prose.² We turn to it immediately to set up the problem that pre-occupies this essay.

What I have to say, in its pieces, is not so daring. Scholars have argued for these individual positions before, as others have argued against them (I have learned from all sides). The way the pieces are put together and the lessons to be learned from the organization of the whole is where I may have something distinctive to contribute, and the issue with Anaximander too is about the organization of the whole.³

I. THE CENTRAL PROBLEM OF THE ESSAY

The best source for Anaximander's one extant passage is the commentary on Aristotle's *Physics* by the sixth-century A.D. author Simplicius.

1. For Anaximander as the first philosopher, see Graham, *Explaining the Cosmos*, 4–5.

2. For a defense of this claim with respect to Pherecydes of Syros, see Kahn, *Anaximander and the Origins of Greek Cosmology*, 240.

3. The account whose general positions most closely resemble mine that I have found in print is Sinnige, *Matter and Infinity*, but we argue for them very differently. In a briefer account, see Ballou, *Straight and Circular*, 24–26, also argues along similar lines. For critiques of Sinnige, see O'Brien, review of *Matter and Infinity*, 161–67; Hamlyn, review of *Matter and Infinity*, 280; Gulley, *The Pre-Socratics on Infinity*, 26–27; Bicknell, review of *Matter and Infinity*, 240–41; Minar, review of *Matter and Infinity*, 54–55.

Simplicius supplies the quotation within a discussion of the principle or *archê* attributed to Anaximander, namely, the *apeiron*, which is usually translated as “the boundless,” “the indefinite,” “the infinite,” “the unlimited,” or “the indeterminate.” Simplicius tells us:

Anaximander named the *archê* and element of existing things “the boundless” [to *apeiron*], being the first to introduce this name for the *archê*. He says that it is neither water nor any other of the so-called elements, but a different substance which is boundless [*heteran tina phusin apeiron*], from which there come into being all the heavens and the worlds within them. **Things perish into those things out of which they have their being, as is due; for they make just recompense to one another for their injustice according to the ordinance [or perhaps: “assessment”] of time**—so he puts it in somewhat poetical terms.⁴

There is much debate about where Anaximander’s actual words begin and end, but there is sufficient consensus to accept that the underlined portion of the text represents the most responsibly generous assignment of words to Anaximander himself, with the passage in bold type being even more certain.

We are told that Anaximander wrote the first prose treatise, but it is reassuring for identifying Anaximander’s own words within Simplicius’s narrative that Simplicius notes the poetic character of what Anaximander has written. This poetic character is marked by an archaic notion of “due” expressed by the word *chreôn* that blends moral and physical necessity and the colorful picture of the things of the world, whatever they are, being born from and dying into each other according to an assessment of justice pronounced by time as a magistrate. However, it does not seem present in the sentences prior to the underlined portion. What is very much present in the sentences prior to Anaximander’s own words, however, is reference to the *apeiron*—the boundless, the indefinite, the infinite—a word that Anaximander himself does not use in the one and only extant passage that we can with reasonable confidence attribute directly to him.

Here, then, is the issue of this essay. (1) Anaximander, we are told by our best sources of information about him, is the philosopher of the *apeiron*, but (2) the one passage that is comprised of his own words not only fails to mention the *apeiron* explicitly, but also makes no obvious

4. Translation from *HGP*, vol. I, 76. In a briefer account, Ballou, *Straight and Circular*, 24–26, argues along similar lines.

reference to it. Among scholars of the text, half do not think that the passage makes any reference to the *apeiron* at all.⁵

Thus there is a gap between Anaximander, the philosopher of the *apeiron* as we are told of him by others, and the Anaximander who speaks for himself in the few words left to us. Presumably an adequate interpretation of Anaximander would bridge this gap.

Simplicius, for one, displays no doubt that his quotation of Anaximander concerns the *apeiron* and holds it to be the material source out of which the things of the world come. He mentions the heavens and the worlds within the heavens coming from the *apeiron* in contradistinction to their emergence from a determinate element like water, and he then moves to the quotation. But the quotation itself, besides not mentioning the *apeiron* or the elements, shows no interest in a material *archê* for the things of the world and provides, not a cosmogony, but rather a cosmology of unspecified things active and passive with respect to each other within the world according to a law-like necessity that governs the whole. This discrepancy between the quotation and its context does not suggest merely a gap to bridge or two sides to integrate in Anaximander's thought. It also raises the suspicion that Anaximander's own words and those of others concerning him may be at odds.

This essay argues for a specific way to understand Anaximander as both the philosopher of the *apeiron* and the philosopher of the cosmology presented in the one passage preserving his own words. In addition, it is an interpretation that implies some large claims about the nature and course of early Greek philosophy as a whole. In a recent book, Daniel Graham argues that the framework of "the Ionian tradition" (as he calls it), which begins with Anaximander, dominates and informs the entire history of ancient Greek philosophizing to Socrates, Plato, and Aristotle.⁶ In a different way, I make similar claims for what Anaximander begins.

The essay proceeds in the following way:

- II. A brief discussion of the nature of the documentary evidence for Anaximander and its transmission in order to clarify and sharpen the central problem of the essay, namely, the gap between the quoted Anaximander and the reported Anaximander;

5. Couprie, "The Discovery of Space: Anaximander's Astronomy," 167.

6. Graham, *Explaining the Cosmos*, 26–27.

- III. An argument about the meaning of the word “*apeiron*” in Anaximander;
- IV. Further discussion of the meaning of Anaximander’s verbatim passage (known in the collection of Diels/Kranz as fragment B₁);
- V. A proposal about the relation between the *apeiron* as Anaximander means it and time in the B₁ fragment; and
- VI. A statement of some larger conclusions.

II. THE DOCUMENTARY EVIDENCE FOR THE PHILOSOPHY OF ANAXIMANDER

None of the written works of the early Greek philosophers has come down to us in more than fragments. The documentary evidence for them consists of quotations from their writings embedded in reports about their thought found in later authors, beginning with Plato. In the case of Anaximander, Aristotle is the first source for any information about him, followed by his disciple Theophrastus.⁷ Charles Kahn points out that, except for the chronographer Apollodorus, there is no evidence that anyone later than Aristotle and Theophrastus had access to Anaximander’s book.⁸ Thus Kahn concludes: “There is then no reason to assign any historical value to a later report of Anaximander’s teaching, except insofar as the author relies upon Aristotle and Theophrastus.”⁹ The principal extant sources for documentary evidence from this Aristotelian font are Simplicius (fifth century A.D.), Hippolytus (c. A.D. 170–c. 236), Eusebius (c. A.D. 260–340), Plutarch (c. A.D. 50–c. 120), and Stobaeus (fifth century A.D.).

Since our documentary evidence for Anaximander is dependent on Aristotle and Theophrastus and with one exception consists entirely of reports and testimonies, rather than quotation, the vexed question about the reliability of Aristotle and Theophrastus as historical witnesses to the thought of the earlier thinkers is especially pressing. Harold Cherniss famously argued in *Aristotle’s Criticism of Presocratic Philosophy* (1935) that Aristotle sees all things philosophical according to his own lights and thereby fails as a reliable witness. Cherniss’s student J. B. McDiarmid

7. HGP, vol. I, 72.

8. Kahn, *Anaximander*, 11; see, also, HGP, vol. I, 76.

9. Kahn, *Anaximander*, 11.

mid in “Theophrastus on the Presocratic Causes” (1953) concluded that Theophrastus is no better. Simplicius’s report from Theophrastus quoted above that Anaximander sought an *archê* in the sense of the material cause of all things and that he designated the *apeiron* as that *archê* is a prime example of tainted testimony. Even Guthrie, who defends Aristotle as an historian of philosophy, says about Anaximander and his time: “At present the very word ‘matter’ is an anachronism.”¹⁰ To give up the testimonies and reports about Anaximander (the “A” fragments in the Diels-Kranz organization of the documentary evidence) as unreliable guides to his thought would ditch most of what we think we know about Anaximander, but the testimonies and reports cannot be accepted as direct or unqualified witnesses to Anaximander’s thought in general or his extant verbatim fragment.

Kahn, whose thorough study of the Anaximander doxographical tradition is invaluable, makes a helpful distinction, which also highlights more issues.¹¹ Kahn defends Theophrastus as a witness to Anaximander, but grants that his analyses are so heavily dependent upon Aristotelian categories as to be anachronistic by any modern standard. He goes on to say: “And his lack of a fully historical method becomes most serious where fundamental philosophic doctrines are involved, such as those concerning the ἄρχαι. For it is in regard to such basic matters that the variations of language and conception are most significant between one age and another. . . . In general, the Theophrastean doxography (where it can be reconstructed) is fully reliable for the detailed theories of heaven and earth. But it requires very close scrutiny whenever more general principles of reality and causation are under discussion.”¹² Indeed, the testimonies contain such a large amount of detailed astronomical, meteorological, geographical, and biological views that there seems no good reason to doubt in regard to the positions of the heavenly bodies, the shape and place of the earth, the emergence of animal and human life, and so on. We can also accept at face value, for example, that Anaximander drew the first map. Figuring out the meaning of Anaximander’s general and most basic positions, however, including the meaning of the verbatim quotation and the role of the *apeiron* in his thought, is another

10. *HGP*, vol. I, 89.

11. Kahn, *Anaximander*, 11–71.

12. *Ibid.*, 75–76.

matter, and one that is underdetermined by the details that may be accepted as incontrovertible.

Some scholars downplay the verbatim fragment and the central issue of the *apeiron* for other matters reported in the testimonies and identified as Anaximander's true contributions. This can concern doctrine, such as the report that Anaximander held that the earth requires no support,¹³ or it can regard method, such as the claim that the reports and testimonies display Anaximander's use of a new rational scientific method and (implicit) recognition of principles such as sufficient reason.¹⁴ Dirk Couprie, for example, justifies concentrating on Anaximander's astronomy by stating at the outset of his study that we do not know the exact meaning of the *apeiron* and can only guess at its relation to fragment B1 and to other things that Anaximander says.¹⁵

Is retreat from the largest issues and a comprehensive account of Anaximander's thought necessary? What is necessary for any serious interpretation of Anaximander to be possible is supplying the proper context, as is commonly recognized. Even Cherniss, who is merciless about Aristotle as a reliable witness to the views of his predecessors, does not recommend simply ignoring what Aristotle and followers say. To the contrary, we must take into account the Aristotelian biases, so that a historically accurate account can be reconstructed. Cherniss writes with respect to the verbatim fragments of the early Greek philosophers, all of which are quoted in other sources, that:

In considering any so-called fragment, therefore, it is necessary not to be content to read it in isolation. One must take into consideration the whole context in which it has been preserved (a context which sometimes is as extensive as a whole book of Aristotle's *Metaphysics*), the ultimate source of that context

13. The first item mentioned regarding Anaximander is found in Algra, "The Beginnings of Cosmology," 55. This approach, it seems to me, follows Apollodorus, who saw a copy of Anaximander's book in the second century B.C. and whose list of section titles, as Guthrie points out, indicates Anaximander's range of interests in matters like geography and astronomy, or the focus of his interests, namely, "a universal geography and history," where whatever cosmogonical or cosmological views he had were only introductory in character. See *HGP*, vol. I, 75–76, including his references.

14. Algra, "Beginnings," 55 (quoting Kahn, *Anaximander*, 77); cf. Graham, *Explaining the Cosmos*, 5, 11, 14 ("the influence of the boundless can recede into the background as we study the regularities themselves which become the foreground of research"), and 26–27.

15. Couprie, "Discovery of Space," 167.

if it can be discovered, and the possible reasons why this particular fragment is quoted or this particular interpretation adopted in this particular place.¹⁶

Cherniss, somewhat like Kahn, notes that the largest philosophical issues are the ones, with respect to Presocratic thought, that are “most thoroughly concealed and misrepresented as a result of the channels through which it has been transmitted.”¹⁷

The need to supply context is now widely recognized against an older view that the B fragments could and should be isolated and studied fruitfully on their own. The quoted B fragments, it is now emphasized, have been excised from their context in the literary whole of which they were a part and from the time and milieu in which they were composed when standards and means for quotation were fluid and imprecise.¹⁸ Catherine Osborne compares them on their own to “a small heap of bolts and screws and no structure in which to make them work.”¹⁹ The quoting A fragments are themselves portions of original literary wholes composed in a different time and milieu. Cherniss recommends all of Book I of the *Metaphysics* as the minimum context for interpreting individual reports by Aristotle about Presocratic thinkers in the book. But is even this a large enough context? Cherniss, as we noted above, sees the context of the quoting source as a malign influence of distortion to overcome. Osborne caused a stir when her book appeared arguing the opposite, that the quoting context is the positive context and framework for interpretation.

Supplying a context for verbatim or “authentic” fragments from a philosopher for whom only one quotation survives is the limit case. Kahn’s solution, which he justly sees as paradoxical, is to interpret the B fragment in terms of the testimonies preserved in the A fragments. Kahn argues that:

16. Cherniss, “The Characteristics and Effects of Presocratic Philosophy,” 2. Cherniss continues: “Such careful investigation, comparison, and reflection are necessary before one can feel even reasonably sure that one is ascribing to a Presocratic philosopher a conception or an attitude that was his own and not some later interpretation or deformation of it” (2).

17. *Ibid.*, 2.

18. For criticism of the view that the doxographers lacked the linguistic resources to quote others with precision, see Barnes, “The Presocratics in Context,” 329–31, which reviews Osborne’s, *Rethinking Early Greek Philosophy*.

19. Osborne, *Rethinking Early Greek Philosophy*, 9.

. . . the fragment itself is too brief to provide its own context, and we cannot altogether rely upon the one within which it is preserved. Paradoxically enough, the detailed speculations of Anaximander, for which we depend entirely upon later paraphrasing, are more accessible to us than the general philosophic doctrine which has come to us partially in his own words. Indeed, *it is these specific theories alone which can provide us with an authentic context for the interpretation of the fragment itself.*²⁰

This is an exceedingly strong claim. It asks us to accept that the sole context for interpreting fragment B₁ are testimonies of particular doctrines from sources admitted to be unreliable historical witnesses to Anaximander's general outlook. Furthermore, however much we are inclined to accept as reliable reports of particular and specific doctrines—after all, why would someone make this information up?—taken together they underdetermine what the general doctrine must be. Indeed, some sense of Anaximander's most fundamental outlook is needed to interpret the details in their overall arrangement and interrelated meaning. That Kahn relegates the discussion of the meaning of the word *apeiron* to an appendix strikes me as odd, but it may comport with his view of the single context for interpreting fragment B₁.

Scholars today are finding all sorts of contexts for interpreting Anaximander, including technological and artistic ones like contemporary temple architecture and vase painting,²¹ scientific ones like contemporary astronomical theories combined with empirical observation guided by them,²² and contemporary social and political contexts. The interpretation of Anaximander that follows is rather old fashioned with respect to context selection. It depends upon two contexts used together, namely, (1) what we can know about the contemporary traditional, religious, and intellectual outlook from a variety of sources as the primary context (2) in relation to the context afforded by the course of philosophy from Anaximander to Socrates, where we have a growing number of verbatim fragments to consider.²³

20. Kahn, *Anaximander*, 76, emphasis added.

21. Hahn, *Anaximander and the Architects*; Laporte, "Attic Vase Painting and Pre-Socratic Philosophy," 139–52, especially 144ff.

22. Couprie, "Discovery of Space."

23. Cornford, *Principium Sapientiae*, 171, asserts the necessity of this primary context: "Our information is so scanty that it is impossible to reach even a probable conclusion, if Anax-

III. THE MEANING OF THE WORD *APEIRON* IN ANAXIMANDER

The first step in my own interpretation, which seeks to bring together Anaximander of the one quotation and Anaximander the philosopher of the *apeiron*, is to argue that the primary meaning of the word *apeiron* intended by Anaximander is “round” or “spherical.” This is an ordinary and uncontested meaning of the word,²⁴ and legendary scholars like Diels and Cornford have proposed it as Anaximander’s meaning.²⁵ This sense has not gained general acceptance, however, and important discussions of the meaning of *apeiron* in Anaximander often fail even to consider it.²⁶

There is debate whether *apeiron*, whose initial letter “a” functions as a privative, is derived from the noun *peras* or *peirar*, “limit,” so that it means “without limit,” unlimited,” “indefinite,” “infinite,” or from the root of a verb like *peraô*, “to traverse,” to pass through,” so that it means “untraversable,” “inexhaustible,” “boundless.”²⁷ Whatever the derivation, *apeiron* is taken to mean something that is unlimited, indefinite, infinite, or boundless (1) in time, (2) in kind or quality, or (3) in space.

No one, so far as I know, denies that Anaximander’s *apeiron* is indefinite, infinite, or boundless in time. Aristotle himself tells us that Anaximander calls the *apeiron* “deathless and imperishable (*athanaton . . . anôlethron*)” (*Physics* Γ.4.203b13 = DK 12B3). From Hippolytus we have that it is “eternal and ageless (*aidion . . . agêrô*)” (*Ref.* I 6, 1 = DK 12B2).²⁸

It is widely accepted that the *apeiron* is unlimited, indefinite, or indeterminate in kind or quality.²⁹ In the testimonies deriving from Theophrastus, it was Anaximander’s distinctive contribution to identify the

imander’s system is treated as a purely rational construction, having no relation to earlier modes of thought.”

24. For *apeiron* meaning round, circular, or spherical, see *LSJ*, revised ed., 184. See also *HGP*, vol. I, 85 with n2, and Cornford, *Principium Sapientiae*, 182.

25. KRS, 110n1, with the review of KRS in Woodbury, Review of *The Presocratic Philosophers: A Critical History with a Selection of Texts*, by G. S. Kirk, J. E. Raven, and Malcolm Schofield, 75–77: 610; Cornford, *Principium Sapientiae*, 176–77; *HGP*, vol. I, 85.

26. See the otherwise thorough discussion of Kahn, *Anaximander*, 231–39, at 232 and 235; see also Graham, *Explaining the Cosmos*, 29–31.

27. Kahn, *Anaximander*, 231–32; Graham, *Explaining the Cosmos*, 29.

28. *HGP*, vol. I, 83–84.

29. *HGP*, vol. I, says this is the chief meaning.

archê as none of the determinate physical elements like water or air. But a number of more recent scholars establish on philological grounds that Anaximander does not mean by the *apeiron* something qualitatively indeterminate. Aryeh Finkelberg writes:

Now the Greek word may mean “boundless, infinite, countless” and “endless” in the sense of “circular.” . . . Gottschalk is thus right in pointing out that the widely accepted idea that under τὸ ἄπειρον Anaximander meant “that which is without internal boundaries or distinctions,” in effect, “qualitatively indeterminate,” has no linguistic justification. In calling his principle τὸ ἄπειρον Anaximander may have meant to specify it as spatially infinite (or more plausibly historically—indefinitely large) or temporally infinite, viz. eternal, or, what is most probable, both; or even as spherical; but qualitative indefiniteness certainly was not what he could have intended to express by this term.³⁰

Graham agrees, saying that one might infer that Anaximander’s *apeiron* is indeterminate qualitatively, but that the semantics of the word requires an inference.³¹ Anaximenes, Anaximander’s younger colleague in Miletus, identifies the *apeiron* with the determinate element air (Simplicius, in *Phys.* 24, 26 = DK 12A5). On the assumption of a qualitatively indeterminate *apeiron* as Anaximander’s major philosophical advance, Anaximenes’s move has been seen as puzzling and retrograde. Shedding this assumption allows Anaximenes to be viewed as developing Anaximander’s thought rather than betraying it.

This leaves for consideration the sense that *apeiron* in Anaximander means spatially indefinite, infinite, or boundless. If the primary meaning of *apeiron* is round, circular, or spherical, there is a ready sense in which it is spatially boundless. The widely held view, however, that the *apeiron* extends indefinitely or infinitely in space in a straight line, cannot, in my view, be sustained. It is often pointed out that actual spatial infinity is excluded on the grounds of anachronism. It is not thought of until the atomists if not modern mathematics.³² The case of indefinite spatial extension is more plausible, but Anaximander is too early a thinker for such an idea. Even the notion of indefinite extension in the sense of al-

30. Finkelberg, “Anaximander’s Conception of the *apeiron*,” 230, which cites H. B. Gottschalk, “Anaximander’s *Apeiron*,” 51–52.

31. Graham, *Explaining the Cosmos*, 30.

32. McKirahan, “Zeno,” 139–41; *HGP*, vol. I, 85.

ways being able to take another step in a straight line, like the notion of indefinite division in the sense of always being able to cut a line segment in two, becomes a conceptual possibility only after Parmenides in a thinker like Zeno.³³

Kahn champions the view that Anaximander's *apeiron* is "primarily a huge, inexhaustible mass, stretching endlessly in every direction" and even says that "[t]he Boundless is in fact what we call infinite space, the antecedent for the atomistic void as well as for the Receptacle or Nurse of generation in Plato's *Timaeus*."³⁴ Like many others, though with less reserve, since he holds for an actual infinity, Kahn pictures the universe, which is itself spherical, as surrounded by the spatially boundless mass of the *apeiron*.³⁵ This talk of surrounding comes directly from Anaximander, according to Aristotle, who relates Anaximander's view that the *apeiron* surrounds all things (*periechein hapanta*, *Physics* Γ.4.203b11 = DK 12A15). Aristotle also notes that thinkers like Anaximander who posit one material substance say that it "surrounds all the heavens, being infinite" (*ho periechein phasi pantas tous ouranous apeiron on*, *De Caelo* Γ.5.303b12–3). The word "infinite" here translates *apeiron*, and it is worth noting that the round surrounds at least as well as the infinite or indefinite would. In addition to surrounding all things, according to these testimonies, the *apeiron* also "steers all things" (*panta kubernan*) and is divine (*Physics* Γ.4.203b11–2 = DK 12A15). The surrounding *apeiron* is active on and masters in some fashion all that it surrounds.

The textual evidence that Kahn presents for his interpretation either begs the question or comes from a later, transformed outlook. The pre-Parmenidean passages that Kahn cites are from Anaximenes and Xenophanes. All that should be concluded from the fact that Anaximenes, the associate of Anaximander, says that the *archê* is air and that air is *apeiros*, is that the word meant the same thing for both of them.³⁶ The fragment of Xenophanes cited by Kahn twice, DK 21B28, in a standard translation reads: "Of earth this is the upper limit which we see by our feet, in contact with air; but its underneath continues indefinitely."³⁷ The phrase "continues indefinitely" translates "*es apeiron hikneitai*," which

33. McKirahan, "Zeno," 139–41; KRS, 110.

35. *Ibid.*, 234.

37. Translation of KRS, 10.

34. Kahn, *Anaximander*, 233.

36. *Ibid.*, 234.

can simply mean “arrives at” or “reaches the spherical,” in the sense that the earth goes all the way down to the surrounding and encompassing limit of the universe. (Xenophanes is taking a stand, apparently against Anaximander, about what supports the earth.) All the other evidence that Kahn cites is post-Parmenidean, such as Zeno, Anaxagoras, and the atomists; but after Parmenides, who incited philosophers to judge by reason (*krinai de logôi*) rather than by the senses (B7), that which is spatially indefinite is finally conceptually possible. It is not yet so for thinkers like Anaximander and Xenophanes.

Kahn thinks that Parmenides, who talks about being in terms of “the unshaken heart of well rounded truth” (B1.29), is the one who inaugurates the notion of the universe as a finite sphere, followed by Empedocles, Plato, and Aristotle.³⁸ Kahn is correct that Parmenides thinks that the universe is a finite sphere, but were Parmenides the first to do so, it would be ironic that the thinker who makes a spatially indefinite universe conceptually possible would be the first to propose a bounded one. In fact, a bounded universe is an old, traditional idea, which philosophers inherit.³⁹ If I am right that Anaximander is incapable conceptually of having an indefinitely extended *apeiron* surrounding the phenomenal universe, but rather conceives the *apeiron* as the encompassing and ruling spherical extremity of the phenomenal universe, then Anaximander as a philosopher has formulated a position about the nature of the whole that is maintained by every philosopher after him—with the exception of the atomists—including Xenophanes, Parmenides, Empedocles, Anaxagoras (*pace* Kahn), and Plato and Aristotle.

My claim is that the primary meaning of the word *apeiron* in Anaximander is round or spherical. He conceives the *apeiron*, which surrounds and steers the phenomenal universe, as the eternal and ageless encompassing spherical limit of the whole. The *apeiron* is boundless and without limits, since it is ageless and it presents no bounds for a traverse that must begin at one point and end at another. There is no in-

38. Kahn, *Anaximander*, 234.

39. The traditional world picture of the universe as a great heaven, the aether, the air, earth and sea, with Tartaros or Hades below, that is symmetrical and bounded, is nicely presented at KRS, 9–10. There at KRS, 10, “a variant conception” which “made the earth stretch downwards indefinitely” is given citing Xenophanes, DK 21B28, where “*es apeiron*” is translated as “indefinitely,” a translation that begs the question, since it could be translated “to the circular [limit of the universe].”

definitely extensive rectilinear expanse to it, which would be not only conceptually impossible for a sixth-century B.C. thinker, but also a notion offensive to the persistent Greek sense that the perfection and completion appropriate to the divine, ruling, surrounding substance of the whole has the completion and beauty of limit and form.⁴⁰ Anaximander, I contend (without being able here to present all the textual evidence for later thinkers), articulates a conception of the whole or of the universe that persists as the mainstream view in ancient Greek philosophy to which the atomists with their atoms and the infinite void are the outliers and foil.

IV. A FURTHER LOOK AT ANAXIMANDER'S QUOTATION

Let us return to Anaximander's verbatim fragment to consider a few main points about it in more detail. Anaximander says that things are born out of things (*ex òn de hê genesis esti*) and die into these things (*tên phthoran eis tauta*). These births and deaths, which may be meant literally,⁴¹ take place within the phenomenal universe between things, and not out of and back into the unmentioned *apeiron*, a point confirmed by the subsequent explanatory statement that things pay the penalty and make retribution to each other.⁴²

What Anaximander means by "things" (*tois ousi*) cannot be determined by the quotation alone. Candidates range across the ordinary, individual things of the world, which all in some way are born out of and die into each other (a bit of imagination may be necessary: I kill what

40. Note the discussion at Kahn, *Anaximander*, 231–32, about the poets' descriptions of things as both boundless and having limits. It has always been a problem in conventional interpretations of Anaximander how he could make the divine substance boundless in the face of ideals of limit and form.

41. It is quite possible that Anaximander literally means birth and death for the coming to be and ceasing to be that he labels *genesis* and *phthora*. One *testimonium*, A10, talks about the *genesis*, coming to be or birth, of the cosmos as a biological emergence from the eternal (*to ek tou aidiou gonimon*), presumably the *apeiron*, of the hot and the cold. A sphere of flame grows around (*periphuênai*) like the bark of a tree, where the word for bark, *phloion*, means any kind of membrane. KRS, 131, grants these biological and embryological resonances, but downplays them, and it argues explicitly against Cornford's comparison to the Orphic cosmogonical egg. It also adds, however, a citation of Baldry's work at KRS, 133n1, which further supports them.

42. HGP, vol. I, 77n2, 81, 81n1; Kahn, *Anaximander*, 167: "The 'poetic expressions' clearly point to a relationship of the elements among themselves (ἀλλήλοισι). Merely on grammatical grounds, there is no term in the fragment which could refer to the ἄπειρον."

I eat and what I eat eventually kills me), and the elements, as Simplicius believes. Kahn broadens out the notion of elements into “elemental powers and compounds.”⁴³ Many interpreters see in the quotation an instance of the common archaic outlook that the physical universe is comprised of opposites, so that Anaximander’s things are all the opposites of the world, such as hot and cold, wet and dry, day and night, winter and summer, and so on.⁴⁴ Guthrie writes that “[t]he conflict of opposites is an undeniable fact of nature.”⁴⁵ At this time the opposites are not yet conceived as qualities of things but things themselves, hot and cold, wet and dry, are hot things and cold things, wet things and dry things.⁴⁶ In this way the world made up of opposites is a world made up of contending things.

In any case, a thing for the purposes of the quotation is something that has an identity over time from birth until death, whose behavior is governed according to a necessity that is both physical and moral (*kata to chreôn*). It is physical necessity because the necessity is functioning within the physical world and the physical things of the world are subject to it without exception. It is a moral necessity because the goings-on within the world are matters of justice and injustice and all things within the world, without fail, are subject to penalty and retribution for injustice.

That each thing has a claim in justice against other things implies that existence itself is not an injustice. That all things are mortal implies that a propensity to injustice is found in all things and proves irresistible. Greek medical texts speak of health as a matter of justice, disease as a state of injustice, and medical intervention as the restoration of justice.⁴⁷ These parallels from medicine fit well with the biological resonances of the quotation and other fragments. They also provide a framework for seeing how normal, healthy existence is just, not unjust, and yet injustice inevitably occurs, since every living organism is prone to illness and eventually dies.

Anaximander’s quotation can also be seen as an expression of a traditional tragic pattern of life. Gilbert Murray writes:

43. Kahn, *Anaximander*, 182.

44. The Pythagorean table of opposites is a formalization of this outlook; see Aristotle, *Metaphysics* A.5.986a22–26.

45. *HGP*, vol. I, 79.

46. *Ibid.*, 79, which cites Cornford, *Principium Sapientiae*, 162.

47. Kahn, *Anaximander*, 178.

. . . Thucydides, Herodotus, the tragedians, and indeed all fifth-century writers, tend to see life in what has been called “the tragic pattern,” much as modern writers see it in terms of evolution. Life to them is a story of Growth, Hubris, Downfall; it is so with the day, with the year, with all plants and beasts and the human body; . . . The conception that all things that live and grow must in the due course of time “make atonement for their injustice” by perishing was not peculiar to Anaximander but was part of a common atmosphere of thought.⁴⁸

Things are not born by an act of injustice on their part, and they are not unjust by virtue of being alive. A just life is required and presumed possible, or else retribution would not be just. Yet things have this propensity to overreach, to grasp for more than their due, to exceed the bounds of equality governing relations with others. They inevitably succumb to it and must pay the penalty.⁴⁹ Giving in to the propensity to overreach and grasp for more has temporal dimensions, whether due to too much concern for time—anxiety about having enough for an uncertain future—or not enough concern for it—confidence that one’s personal strength will not waver or be overpowered in a future deemed certain. In any case, time itself determines the fate of things, no matter how they determine to overreach and grasp for more to secure their fate. Kahn says that the phrase “*kata to chreion* (according to due or necessity)” is “the most impersonal Greek formula for Fate” (which he capitalized, nonetheless).⁵⁰ Time rules over the fate of all things in accord with a justice based on equality and punishing without exception overreaching and grasping for more.

This is how Anaximander presents time in the quotation. Time is the judge making assessment of injustice and enforcing the payment of penalty and retribution. The linguistic character of the prose of the quotation is that of the courtroom, as Kahn shows.⁵¹ Werner Jaeger in his Gifford Lectures of 1936 set forth in detail the argument that time in this quotation sits as a magistrate dispensing justice.⁵² More controversial is the strongly theological character that he accords this characterization

48. Murray, “Francis McDonald Cornford: 1874–1943,” 422–23 on Cornford’s first book, *Thucydides Mythistoricus*.

49. *HGP*, vol. I, 81, notes: “Anaximander has noticed that it is the natural tendency of each of the elements to swallow up its opposites.”

50. Kahn, *Anaximander*, 180.

51. *Ibid.*, 169–70.

52. Jaeger, *The Theology of the Early Greek Philosophers*, 34–37.

of time, which Jaeger asserts is not a mere model: “Here is no sober rehearsal of the regular sequence of cause and effect in the outer world, but a world-norm that demands complete allegiance, for it is nothing less than divine justice itself.”⁵³ The conception of time as a magistrate is also present in Solon and other contemporary writers.⁵⁴ All things are in time—they are born, they live a span, and they die—and time rules over their span as a judge determining their fate, and as a judge, if Jaeger is correct, with divine standing and authority.

As we have seen, according to the testimonies (1) the *apeiron* surrounds, if not pervades, all things; (2) the *apeiron* steers, that is, rules, all things; (3) the *apeiron* is ageless and everlasting; and (4) the *apeiron* is called divine. These epithets and attributes of the *apeiron* from the A fragments show overlap or convergence of meaning with time as depicted in Anaximander’s quotation, but is this as close together as we can bring the *apeiron* of the testimonies with time as Anaximander presents it?

V. TIME AND THE APEIRON

I have argued that the primary meaning of the *apeiron* in Anaximander is “round” or “spherical.” I want now to present the evidence from earlier and contemporary poetic and mythological sources that time also is considered round or spherical, especially as the arbiter and judge of fate, and is located at the extremities of the universe.

Cornford cites texts to show “the persistence in philosophy of the primitive circularity of time.”⁵⁵ These texts bear on the cycle of seasons through the year governed by the sun’s revolutions and the more general accounts of cyclical eternal motion offered by philosophers like Empedocles and Aristotle.⁵⁶ Richard Onians’s book, *The Origins of European Thought*, collects evidence from a variety of sources of archaic thought relevant to topics considered by the philosophers. The documentary evi-

53. *Ibid.*, 36.

54. *Ibid.*, 35. See Solon, fr. 24.3 Diehl as quoted at KRS, 121, which talks about being present “in the court of Time” and producing witnesses there.

55. Cornford, *Principium Sapientiae*, 169.

56. *Ibid.*, 168–70. Aristotle, *Physics* Δ.10.218a31–b1, says: “As to what time is or what is its nature, the traditional accounts give us as little light as the preliminary problems which we have worked through. Some assert that it is the movement of the whole, others that it is the sphere itself.” Translation from Barnes, *The Complete Works of Aristotle*.

dence that Onians collects has such a primitive feel that one can appreciate how the inquiries of the philosophers represent a newly rational way of thinking. But there are also conceptual connections and resemblances in the material from these various sources of archaic thinking that seem to me to indicate ways of thinking about the world as a whole that inform the outlook of the philosophers too.

For instance, Onians cites Orphic cosmogonic accounts of time as a serpent encircling the universe as its soul through which the universe develops and is governed. He also cites Pythagorean accounts of time as the governing soul of the universe. Onians offers evidence from Phercydes about time, where it is linked with the notion of *aiôn*, whose ordinary meaning is “period of existence,” “lifetime,” or “life,” but which also denotes the fluid, which is associated with the soul and is believed to be in serpent form. Onians notes that *aiôn* in Pindar also refers to the life fluid as a destiny or fate controlling the lifespan. He also offers abundant textual evidence linking the notions of fate and one’s *telos* or end with bands and circles.⁵⁷

By citing this material I am not claiming direct links to Anaximander’s thought, but pointing out through a number of avenues the intellectual and cultural milieu which Anaximander inhabits, that time is associated with an encircling material body that en-souls and governs the world and with the fate, destiny, and that the ends of the things of the world are also conceived as circles or bands. I find it plausible, then, that time (in the verbatim B1 cosmological fragment), which controls and rules the fates and ends of all things by a necessity ordered to justice, denotes what Anaximander is expressing by the *apeiron* as the divine reality, spherical in form, eternal, indestructible, surrounding and steering the whole of the universe as its *archê*.⁵⁸

VI. SOME LARGER CONCLUSIONS

Let me begin this concluding section of this essay with a less temperate and cautious statement of what I have just written. Time in fragment B1

57. Onians, *The Origins of European Thought about the Body, the Mind, the Soul, the World, Time, and Fate*, 247–51, 242–44.

58. Ballou, *Straight and Circular*, 26, writes: “Finally, it is reasonable to interpret Anaximander’s extant fragment as representing a notion of circular time and balance.”

is the *apeiron* as the divine, surrounding, mastering, force of the whole determining, according to law-like necessity, the fate or ends of all within the world.

Why is this an important conclusion?

In his recent book, Graham argues that we are in no position to say that Anaximander held that the elements or other things come out of the *apeiron* or return to it.⁵⁹ This finding matches what we have discussed above. Much can be said about the development of the universe from the testimonies about Anaximander's doctrines, but we cannot say in Aristotelian fashion that the cosmogony based on the *apeiron* as the material principle out of which the universe comes is the center of his thought.

What we do have, however, is a cosmology that gives a foundational account of all things as a bounded and integrated whole governed by necessity, with fate or ends determined by intelligence and the purpose of justice. This conception of the universe, as a bounded whole steered and governed by an all-encompassing, teleologically ordered *archê*, is the conception of the universe that persists as philosophy develops and matures. The bounded universe governed by the breath of the cosmos, divine *phren*, *logos*, unshaken heart of well-rounded truth, love and hate, or mind is found until the atomists, who finally banish the divine mind or soul of the bounded universe for atoms careening in an indefinitely expansive void. The fundamental understanding of the whole, however, articulated by Anaximander, returns in even more sophisticated forms in Plato and Aristotle.

Recent trends in scholarship include seeing the primary distinguishing purpose of early Greek philosophy to be explaining the *panta*, all things, in the context of the single whole, and to understand the Ionian tradition as a newly rational way of reasoning about the whole that continues to influence subsequent philosophy through Socrates, Plato, and Aristotle is supported, I think, by the account of Anaximander offered here.

59. Graham, *Explaining the Cosmos*, 313–14.

3 ∞ The Problem of Evil in Heraclitus

I

The frequent quotation of Heraclitus by later philosophers resulted in an unusually large number of surviving fragments, but the fragments are brief—even the longest is only three sentences, while in some cases the later writers quoted only a single word. According to the Diels-Kranz edition about 120 fragments survive, but they add up to only about 1,000 words. The brevity of even the longest ones suggests that Heraclitus wrote in a terse epigrammatic style, but there is no independent evidence for it. And since we do not know the order in which they appeared in his writings, we do not know how they may have been meant to reflect on and amplify one another; nor is there always agreement as to which fragments are actual quotations rather than paraphrases or misquotations. Consequently, every attempt by editors or translators to put them into a coherent order results in a different mosaic.¹ Moreover, although

This chapter was originally presented at the Catholic University of America colloquium series on early Greek philosophy, October 12, 2007. An abridged version was presented at the Canadian Philosophical Association meetings in Vancouver, May 5, 2008. I am grateful to Mark McPherran for his helpful commentary on that occasion and to Enrique Hülsz for his helpful comments on an earlier draft of this essay.

1. Thus Heidegger criticizes Eugen Fink for beginning his interpretation from a fragment that enables him to give disproportionate weight to the concept of light, namely B64: “The lightning bolt steers all.” See Fink and Heidegger, *Heraclitus Seminar 1966/67* (hereafter *Heraclitus Seminar*), 135. It was only the prominence that Fink gave to this fragment that troubled Heidegger; Fink’s interpretation of it derived from an essay by Heidegger himself: “Logos (Heraclitus, Fragment 50)” in *Vorträge und Aufsätze*, 207–29: 222, 229. Heidegger’s own point of departure was B1, which focuses on the concept of *logos*.

The most ambitious attempt to order the fragments coherently is that of Charles Kahn’s

it is sometimes obvious that Heraclitus is speaking literally, and at other times obvious that he is speaking metaphorically, he can often be interpreted either way with very different results.²

The longest fragment, which according to Aristotle and Sextus Empiricus was the opening of his book,³ begins:

This *logos* holds always but humans always prove unable to understand it, both before hearing it and when they have first heard it. For though all things come to be in accordance with this *logos*, humans are like the inexperienced when they experience such words and deeds as I set out . . . (B1)⁴

That is what he means in B123 when he says that “nature loves to hide.” He makes a similar point in B72, saying that people “are at odds with the *logos*, with which above all they are in continuous contact, and the things they meet every day appear strange to them.” It is best to leave the term “*logos*” untranslated to preserve its wide range of meanings: word, statement, argument, definition, account, speech, language, reason, ratio, etc.⁵ Why do we fail to recognize *logos* even though it is ever present to us?

The Thought and Art of Heraclitus, which results in a plausible and illuminating arrangement. At the same time, Kahn’s sensitivity to the systematic ambiguity and multiple implications of Heraclitus’s style has the effect of making us aware that fragments that are grouped together by virtue of one of their implications could have been differently grouped by virtue of other implications.

2. *HGP*, vol. I, 427: “It is discouraging, certainly, to note how many different impressions of this world-view have been put forward in the past and continue to be put forward; but one can only give one’s own.” Cf. Heidegger’s “Aletheai (Heraklit, Fragment 16)” in *Vorträge und Aufsätze*, 257–82: “What would be achieved if one wished to reject [a certain interpretation] as simply incorrect? One could at best make it seem that the subsequent remarks believe themselves to hit upon Heraclitus’s teaching in the one absolutely correct way. The task is limited to staying closer to the words of Heraclitus’ saying” (260). At the conclusion of his exegesis he writes: “Did Heraclitus intend his question in the way we just explicated? Does what is said through this explication stand within the field of his representations? Who can know or say? But perhaps the saying says it independently of Heraclitus’ contemporary representational field” (279). Translations are my own unless otherwise indicated.

3. Aristotle, *Rhetoric* Γ 5.1407b16–17; and Sextus Empiricus, *Adversus Mathematicos* VII.132.

4. Unless otherwise specified, translations from the Presocratics are by McKirahan, *Philosophy before Socrates*, occasionally modified.

5. For interpretations of Heraclitus’s “*logos*,” see Kirk, *Heraclitus*, 37–40; Marcovich, *Heraclitus*, 8–9; *HGP*, vol. I, 419–34; Kahn, *Thought and Art*, 97–98; Robinson, *Heraclitus*, 74–76; Curd, “Knowledge and Unity in Heraclitus,” 532–35; Wilcox, “Barbarian *Psyche* in Heraclitus,” 627–30; and Dilcher, *Studies in Heraclitus*, 29–49. Heidegger’s distinctive interpretation can be found in *Einführung in die Metaphysik*, 97–102, and in “Logos (Heraklit, Fragment 50)” in *Vorträge und Aufsätze*, 207–29. Waugh gives a postmodern interpretation in “Heraclitus: The Postmodern Presocratic?” 616.

Heraclitus's answer anticipates Plato's allegory of the cave: we are so used to one kind of experience that it blinds us to a more fundamental reality. This is one of the most frequent themes in the fragments, expressed in many ways. Sometimes the distinction between our ordinary view of things and their true nature is illustrated straightforwardly. When Heraclitus remarks that the sun's breadth "is the length of the human foot" (B3) he is speaking of sensible appearances, while his observation that "If there were no sun, as far as concerns the other stars it would be night" (B99) shows how inadequate our initial perception was.⁶ This distinction between visible appearances and their imperceptible foundation is the original insight of philosophy, implied by Thales's claim that all is water, that is, the true nature of reality is not what it seems.⁷ Heraclitus prefers to conceive it as fire rather than water, and he asks not only about the underlying *material* unity of nature, but also about the ultimate principle *governing* its workings: "Wisdom is one thing, to know the intelligence (γνώμην) by which all things are steered through all things" (B41).⁸ Moreover, for Heraclitus it is not only that we fail to perceive true reality, but that even when we do perceive it its nature is so unexpected that we fail to comprehend it: "All that come upon them do not understand such things . . . but they seem to themselves to" (B17). "Divine things escape recognition because of unbelief" (B86). Therefore, "Unless he expects the unexpected (ἐλπεται ἀνέλπιστον), he will not find it" (B18).

What kind of truth is so unexpected that we fail to recognize it even though it is always with us? Not only is reality different from appearances, it is the very opposite of what we would expect: "Eternity," Heracli-

6. Thus Aristotle: "We imagine the sun to be a foot in diameter though we are convinced that it is larger than the inhabited part of the earth" (*De Anima* Γ.3.428b3-4). Cf. Robinson, *Heraclitus*, 77-78: "From Aristotle (see Kahn, *Thought and Art*, 1193) we can infer that the phrase 'the sun is a foot wide' was a standard example of deceptive appearance (like 'sticks look bent in water')." This seems to be his point also in quoting the children's riddle: "All we saw and grasped we have left behind, but all we neither saw nor grasped we bring with us" (B56), the answer to which is "lice." For Heraclitus the significance of the riddle would be that, like the lice, the reality that we now see will be left behind when we see the *logos*, while the unseen reality—the nature that loves to hide—is always with us. Also see Rethy, "Heraclitus, Fragment 56," 1-7).

7. Julius Moravcsik reminds us that this insight was already present in another way in religious thinking. See Moravcsik, "Appearance and Reality in Heraclitus' Philosophy," 551-54.

8. McKirahan, after Kirk, has "Wisdom is one thing, to be skilled in true judgment, how all things are steered through all things." See Kirk, *Heraclitus*, 286-91; but also Gregory Vlastos's reply to Kirk in "On Heraclitus," 352-53. For other discussions see Kahn, *Thought and Art*, 170-72, and Robinson, *Heraclitus*, 107-8.

tus tells us, “is a child playing, playing a game of checkers; the kingdom belongs to a child” (B52). And, “The most beautiful world-order is a pile of things poured out at random” (B124). This is how things normally appear to us. Throughout the world and its history we commonly believe that life is irrational and unfair, whether because it is without divine governance and therefore intrinsically absurd, or because the gods themselves are unfair by our standards: either they are capricious, as in Homer, or else their justice is not our justice, as in the Book of Job. A world in which bad things happen to good people, and good things to bad people, is, at the level of individuality, a world of random events or a game played by an arbitrary child. But if we can see it at the holistic level, we will see it as a world-order rather than random, and a kingdom rather than a child’s game. Where *these* fragments speak of the universe as random or irrational, B1 told us that all things come to be in accordance with a rational *logos*, and B41 said that an intelligence steers all things through all things. The double point of view is expressed unambiguously in places: “The finest harmony is composed of things at variance” (B8); “Things taken together (συνάψεις) are . . . consonant and dissonant” (B10). The universe is beautiful or random depending on whether we look at it in its harmonious wholeness or its antagonistic component parts. “To God all things are beautiful and good and just, but humans have supposed some unjust and others just” (B102).⁹ God here represents the perspective of the whole, while humans are focused on their partial point of view. The whole is not reducible to the sum of its parts, for although “all things are one” (B50), “that which is wise is set apart from all” (B108).

The double aspect means that Heraclitus is not the relativist that some of the fragments suggest. The impression of relativism derives from observations such as that sea water is palatable and safe for fish but un-

9. Exactly how verbatim Porphyry’s quotation is in B102 is a matter of debate. Kahn suggests that the wording “is that of some anonymous Homeric commentator, perhaps a Stoic, and we cannot know how well it reflects what Heraclitus said.” See Kahn, *Thought and Art*, 183, but cf. T. M. Robinson: “Most modern commentators see no reason for not accepting it as fairly exact.” See Robinson, *Heraclitus*, 149. In any case, the same basic point is evident in other fragments as well: B1 tells us that all things happen in accordance with the *logos*; B41 says that all things are steered through all things by an intelligence; B4, B9, and B61 point out that things that are bad to us are good to other forms of life; B67 identifies God with night, winter, war, and hunger, as well as with day, summer, peace, and satiety; and B106 rebukes Hesiod for considering some days good and others bad (although the authenticity of this fragment has been questioned).

drinkable and destructive to us (B61), asses prefer garbage to gold (B9), and oxen enjoy eating bitter plants (B4). By showing how our conception of what is good and bad is not necessarily shared by other species, Heraclitus shows that “good” and “bad” reflect not properties of the things themselves, but only how things match up with our particular appetites and needs. In this context, “Dogs bark at everyone they do not know” (B97) suggests that the reason we think some things are better than others is merely a matter of unfamiliarity and prejudice. More generally, the famous remark, “The road up and the road down are one and the same” (B60), suggests that what looks one way from one point of view looks exactly the opposite from a different point of view.¹⁰ And the words, “Hesiod considers some days good and others bad, not understanding that the nature of every day is one and the same” (B106),¹¹ imply that nothing is in itself any better than anything else. Nevertheless, for Heraclitus there is also an absolute point of view: “Human nature has no insight, but divine nature has it” (B78), and “The wise is one alone; it is unwilling and willing to be called by the name of Zeus” (B32). The references to Zeus and the divine need not refer to an external deity, but to the divine within us, as when Aristotle writes: “But such a life would be too high for man; for it is not in so far as he is man that he will live so, but in so far as something divine is present in him.”¹² The difference between the relative and the absolute is the difference between the perspectives of each of the individual parts and that of the whole. Since our values are normally based on particular appetites, needs, and self interest generally: “It is not better for humans to get all they want” (B110).

The fragments indicate this double aspect in various ways, sometimes literally but also through metaphor and paradox. B84a, “Changing, it is at rest,” presents a paradox that challenges us to think the difference between the ever-changing parts and the unchanging nature of the whole. Heraclitus’s most common metaphor is sleeping and waking. B89 tells us: “For the waking there is one common world, but when asleep each person turns away to a private one.” Even in our waking world, however, we are asleep in a metaphorical sense: “people fail to notice (*λανθάνει*)

10. For a discussion of the identity of opposites in Heraclitus see *HGP*, vol. I, 445–46.

11. My translation. McKirahan does not consider it authentic.

12. *Nicomachean Ethics* K.7.1177b26–27, revised Oxford translation. For the suggestion that Heraclitus is referring to the divine within us in these passages I am indebted to Enrique Hülsz.

what they do when awake, just as they forget (ἐπιλανθάνονται) what they do while asleep” (B1). In that case there is a second sense in which we need to wake up even after we are awake in the normal sense, a second sense in which we need to go from our private worlds to a common one. In the first we go from our individual dream world to our shared waking world, in the second we go from our divisive individual interests to a recognition of what is common to us all. This idea of the common (ξυνός) is introduced in B2 where it is identified with the *logos* and contrasted with individuality¹³ The situation is analogous to the subordination of individuals to the law, Heraclitus says in B114: “Those who speak with understanding must rely firmly on what is common to all, as a city relies on its

13. Cf. “What we see when awake is death, what we see asleep is sleep” (B21). To be asleep is to see nothing of the world but only sleep itself, and even when we are awake we see only the mortal world of things that are constantly passing away. But as B1 and B2 show, there is one further step: Beyond the sleep that we see when asleep, and the death or transience we see when awake, there is also something eternal that we can awaken to in another sense. The same analogy appears again in B26: “A person in the night kindles (ἄπτεται) a light for himself when his sight is extinguished. While living, he approximates to (ἄπτεται) a dead man during sleep; while awake, he approximates to (ἄπτεται) one who sleeps.” (The translation of the second sentence is Freeman’s in *Ancilla to the Presocratic Philosophers*, 26.) The point of the second sentence is similar to what we have just seen: not only do we resemble someone dead when we are asleep, but when we are awake we normally resemble someone asleep. The first sentence implies this through a different metaphor: Just as we kindle a light for ourselves in the literal darkness of night, we need to kindle a different kind of light for ourselves in the metaphorical darkness of our waking life. Heraclitus often uses word play to establish connections, as in B1 (λανθάνει, ἐπιλανθάνονται), B5 (μιαίνόμενοι, μαίεσθαι), B25 (μύροι, μοίρας), B45 (λόγος [in two senses]), B48 (βίος, βιός), and B114 (ξὺν νόῳ, ξυνῶ). In this case the term ἄπτεται, which originally means to touch, is used in the extended senses of to kindle (touch fire to fuel) and approximate. Taking ἄπτεται more literally, as “touch,” gives no clear sense of the whole, even by the standards of “Heraclitus the Obscure.” Thus Heidegger, who interprets ἄπτεται in the literal sense of “touch,” confesses: “Everything that follows ἐαυτῶ [i.e. everything after the words, “A person in the night kindles a light for himself”] is puzzling to me. I do not see the thrust of the fragment.” See *Heraclitus Seminar*, 131; Kahn, *Thought and Art*, 215, calls it “a thicket of riddles”; and Robinson, *Heraclitus*, 93, agrees that it “is one of the most puzzling of the fragments.” John Burnet, *Early Greek Philosophy* (4th edition; London: Macmillan, 1930), 152, translates quite differently: “Man kindles a light for himself in the night-time, when he has died but is alive. The sleeper, whose vision has been put out, lights up from the dead; he that is awake lights up from the sleeping” (Burnet fragment (77) = DK 12B21). Also see *Heraclitus Seminar*, 127–31, and Gadamer, “Heraclitus Studies,” in *The Beginning of Knowledge*, 74–77. A similar point is implied when B15 says, “Hades and Dionysus are the same,” if Martha Nussbaum is right to identify Dionysus with self-indulgence. Nussbaum, “ΨΥΧΗ in Heraclitus, II,” 159. In that case we can take it to mean that a life devoted to our individual appetites, instead of what is common to all, is a kind of living death. For other appearances of the sleeping/waking metaphor see fragments DK 22B73, 75, 88, and 89.

law, and much more firmly. For all human laws are nourished by one law, the divine law; for it has as much power as it wishes and is sufficient for all and is still left over.”¹⁴ Just as we subordinate our private wills to laws that are common to all members of our society but different from those of other societies, the diverse laws of all societies are themselves subordinate to one that is common to all, and which they all partially reflect. The two levels of law (human and divine) correspond to the two levels of waking (biological and intellectual), as well as to the perspective of the parts and the whole.

In addition to paradox and metaphor Heraclitus sometimes characterizes the whole-part relationship literally, as in B10’s general description: “Things taken together are whole and not whole, brought together and brought apart, consonant and dissonant; out of all things comes a unity, and out of a unity all things.” Other literal characterizations are more narrowly focused. B30 for example, focuses on the material aspect of the whole and parts: “The cosmos, the same for all . . . [is] an ever-living fire being kindled in measures and being extinguished in measures”: individuals come and go, are kindled and extinguished, but the whole endures forever.¹⁵ And sometimes his literal descriptions are in terms of the governing principle, the *logos*: “it is necessary to follow what is common to all. But although the *logos* is common, most people live as if they had their own private understanding” (B2)—we live as if our partial point of view were valid, instead of pursuing that of the common whole. Heraclitus’s project is to lead us from our relativistic partial view to one that is universal or common. Our appetites and ambitions reflect our distinctness from each other and drive us into competition: our successes are measured against others’ failures and vice versa. But rationality is different. Our thinking not only does not prevent others from enjoying the same understanding, it can even help them to do so through example and instruction. Thus “[t]hinking is common to all” (B113) not only in

14. There is a word play between ξὺν νόῳ (“with understanding”) and ξυῶν (“common to all”).

15. The kindling and extinction of individuals and the kindling and extinction of fire are inversely related: “All things are an exchange for fire and fire for all things” (B90); “fire will advance and judge and convict all things” (B66). I agree with Guthrie that the phrase “ever-living” implies a continual exchange at the level of parts rather than a periodic conflagration of the whole in which the world is destroyed (see *HGP*, vol. I, 455; cf. 458). Also see Kirk, *Heraclitus*, 315–24; Kahn, *Thought and Art*, 134–38, and Robinson, *Heraclitus*, 96–97.

the trivial sense that all humans think, which after all is equally true of appetite and ambition, but in the distinctive sense that rational thinking abstracts from our partial viewpoint and aims at something that is impersonally true and therefore available to us all.¹⁶ It is in this same sense that Heraclitus says the world-order or cosmos is the same for all (see B30). Heraclitus is a relativist at the level of the individual, the culture, and the species: what I call good, what my city calls good, and even what all human beings call good, is also bad if other individuals or cities or species find it so. But he is not *ultimately* a relativist because there is a perspective other than those of the individual, city, and species, namely that of the whole, common to all, which Heraclitus calls the *logos*.

II

Fragment B18 says, “Unless he expects the unexpected, he will not find it, since it is not to be hunted out and is inaccessible (ἄπορος).” If it is not to be hunted out and is inaccessible, how can we pursue it? There is no direct path from empirical knowledge to wisdom because, in Heraclitus’s metaphor, wisdom is like waking up, and the transition from empirical knowledge to wisdom, like that from sleep to wakefulness, is not merely incremental but abrupt. Heraclitus’s pedagogical strategy cannot therefore merely give us information and doctrines. It must give us a different way of seeing the world. That is one reason for the paradoxical formulations that short-circuit our ordinary ways of thinking. It is also the reason he says, “Listening not to me but to the *logos* it is wise to agree that all things are one” (B50). Listening to Heraclitus means looking for truth in words and treating what he says as one teaching among others. Listening to the *logos*, on the other hand, means trying to understand the truth that his words point to but can never completely embody. “Eyes are more accurate witnesses than ears” (B101a), means more than that sight is our dominant sense. It means that, although the words we *hear* can give an indication of wisdom, they can never directly impart it the way they impart information; only experiencing truth with our own (doubly awake)

16. B113 has been interpreted in widely different ways: from Kirk’s dismissal of it as a paraphrase of B2 (Kirk, *Heraclitus*, 55–56, 63), to Kahn’s interpretation of it as panpsychism, to Schindler’s proposal to take it as meaning “I cannot think by myself alone.” Schindler, “The Community of the One and the Many,” 425.

eyes can do that.¹⁷ Thus, “The wise is one alone; it is unwilling and willing to be called by the name of Zeus” (B32). It is unwilling to be called by any name, even the highest, because it is beyond naming; but as long as that limitation is appreciated, we may name it as best we can, since only by words can it be communicated at all. Heraclitus resists dogmatism on the one hand, but also skepticism on the other. Just as the oracle of Apollo “neither speaks nor conceals, but gives a sign” (B93), Heraclitus tries to communicate to us in the only way possible something that cannot adequately be put into words.

In Plato’s *Cratylus* Socrates remarks, “Heraclitus says somewhere that everything flows and nothing remains still, and comparing things to the current of a river, he says that you can’t step twice into the same river” (*Cratylus* 402a = A6).¹⁸ Heraclitus does not, however, go as far as Cratylus who, according to Aristotle, “finally thought that nothing should be spoken but only moved his finger [pointed at things], and who criticized even Heraclitus for saying that one cannot step into the same river twice, for he himself thought that one could not do so even once.”¹⁹ If flux and individuality are all there is to the world, then speech, which uses words with fixed meanings and universal application, is always a misrepresentation. In that case, Cratylus believes, we must indicate our meaning not by speaking with our mouth but by pointing with our finger. We can

17. Cf. Nietzsche, “Must one first smash their ears so that they learn to hear with their eyes?” (*Also sprach Zarathustra*, Zarathustras Vorrede §5).

18. The metaphor occurs also in B12, B49a, and B91. Whether these were originally independent statements, or whether one or more is a paraphrase or misquotation of the other(s), is a matter of dispute. The same idea seems implied by B21: “What we see when awake is death,” i.e. everything is always passing away. Even “[t]he sun is new each day” (6)—although others take this to be a more literal scientific claim. See Robinson, *Heraclitus*, 79, and Kirk, *Heraclitus*, 265–79. Some readers doubt that the flux doctrine was meant to apply universally. Kirk, for example, writes that Heraclitus “believed strongly in the value of sense-perception, providing that it is interpreted intelligently. . . . Our observation tells us that this table or that rock are *not* changing at every instant” (Kirk, *Heraclitus*, 376). But observation told the atomists and other Presocratics that rock and other solids did slowly erode. Aristotle says (before refuting it), “the view is actually held by some that not merely some things but all things in the world are in motion and always in motion, though we cannot apprehend the fact by sense-perception. . . . The theory resembles that about the stone being worn away by the drop of water or split by plants growing out of it” (*Physics* Θ .3.253b10–15). As Guthrie writes in response to Kirk, “That the rock is changing every instant we cannot see with our eyes, but it is what their evidence suggests if we apply ‘minds that understand the language.’ . . . The continuous imperceptible change is a natural inference from the observation” (*HGP*, vol. I, 451).

19. *Metaphysics* Γ .5.1010a12–15.

imagine that a disciple of Cratylus, who similarly tried to be more rigorous than his own teacher, might criticize Cratylus for thinking one could even point at anything, since the thing pointed at would already be different by the time he raised his finger. Heraclitus is not blind to Cratylus's point, but he recognizes that it is only half true: "We step into and we do not step into the same rivers. We are and we are not" (B49a). Heraclitus's paradoxical formulations challenge us to see beyond the words without altogether dispensing with them.

If Heraclitus cannot give us this wisdom but only hint at it, what we can do is seek it both within ourselves and in our relation to the external world. The first is suggested by his words, "I searched myself out" (B101). Since "all things come to be in accordance with this *logos*" (B1), it is operative in each of us and discoverable within us. It is always with us whether we notice it or not, for "How can one hide from what never sets?" (B16). Thus, "It belongs to all people to know themselves and to think rightly" (B116). For Heraclitus the self is a microcosm of reality as a whole, so we can discover within ourselves the nature that also encompasses us, that is, the *logos*.²⁰ "The soul has a *logos* that increases itself" (B115) means that the discovery within ourselves of the principle by which all things are governed is the beginning of wisdom, a beginning which is self-increasing once we become attentive to it. That is why "[y]ou would not discover the limits of the soul although you travelled every road: it has so deep a *logos*" (B45).²¹ When Heraclitus said, "Listening not to me but to the *logos* it is wise to agree that all things are one" (B50), the word he chose for "agree" is *homologeîn*, which echoes microcosmically the reference to the *logos*.

As with Plato's subsequent doctrine of recollection, what is called for is not simply introspection but also a sensitivity to the way that the empirical world points to something beyond itself, something that is accessible through our thinking rather than our senses. In B23 Heraclitus writes, "They would not have known the name of justice if these things did not exist," that is, it would never have occurred to us to conceive of justice if it were not for the kind of social interactions that make us aware of the possibilities of exploitation and redress that imply an underlying sense of rightness. Since we must examine the particulars of reality in

20. Dilcher, *Studies in Heraclitus*, 67–69, 90–96, is especially alert to the microcosm-macrocosm theme.

21. Here *logos* has the double meaning of measure and the principle of the universe.

order to become aware of what underlies them, to wake up and see what was always here, empirical investigation is indispensable to the attainment of wisdom: “Men who are lovers of wisdom must be inquirers into many things indeed” (B35).

The importance he attaches to investigation makes him closer to Aristotle than to Plotinus, but he is under no illusion about how few of the details that such investigations require us to learn will actually be useful in our search for wisdom: “Those who seek gold dig up much earth and find little [gold]” (B22). Consequently, “Much learning does not teach insight (νόον)” (B40), and “Eyes and ears are bad witnesses to people if they have barbarian souls” (B107), that is, if they do not understand the language.²² It is not the empirical details themselves that are of interest, but how they point beyond themselves. In B1 Heraclitus said that “people are like the inexperienced when they experience such words and deeds as I set out, distinguishing each in accordance with its nature (φύσιν) and saying how it is.” The words and deeds themselves are not what is important here, but their underlying “nature” (φύσις)—people who regard words and deeds as sufficient in themselves are “like the inexperienced.” The *nature* of a thing is a bridge between its uniqueness alongside an infinite number of other unique individuals and the nature of the whole in which all individuals are united and reconciled. For all his emphasis on flux and uniqueness, Heraclitus has no hesitation in making generalizations about fixed species or natures such as oxen (B4) asses (B9), pigs (B13, B37), birds (B37), dogs (B97), and of course human beings (B78 and *passim*). For Heraclitus, unlike his disciple Cratylus and others, the common natures of things count for more than their uniqueness.²³

The tension between unique individuals and their common natures plays itself out in Heraclitus’s frequent references to the way opposites are

22. “Barbaros” means someone who does not speak Greek. Also see Kahn, *Thought and Art*, 106–7, and Dilcher, *Studies in Heraclitus*, 80. Joel Wilcox argues for taking “barbaros” in its more colloquial sense of “foreigner”: “Eyes and ears are bad witnesses for those whose *psychai* are foreign to the *logos*.” See Wilcox, “Barbarian *Psyche*,” 633. Nussbaum, “ΨΥΧΗ in Heraclitus, I,” 9–12, takes it to refer to linguistic incompetence more generally.

23. And so do their material elements. The material basis of all things is the mixture in different proportions of the same four elements, fire, water, earth, and air (B76a). So all things, no matter how diverse, are not only to be understood in terms of common species but also in terms of the four elements common to all things. The goal of wisdom is not to simply to become acquainted with the multitude of individual things themselves, but with what lies behind them, that “by which all things are steered through all things” (B41).

united within a common cycle. “The same thing is both living and dead, and the waking and the sleeping, and young and old; for these things transformed are those, and those transformed back again are these” (B88). They are the same because they are poles of single processes: the process of aging, the cycle of life and death,²⁴ and the cycle of waking and sleep. In other fragments he calls attention to similar circles or cycles of day and night (B57), up and down (B60), cold and hot, and dry and wet (B126). In one place, he makes this concept of a circle explicit and connects it with the idea of the common: “The beginning and the end are common on the circumference of a circle” (B103). However much things are manifestations of change, they are also manifestations of constant patterns or cycles. These patterns, in turn, are themselves manifestations of the first principle of all things: “*God* is day and night, winter and summer, war and peace, satiety and hunger, but changes the way <fire,> when mingled with perfumes, is named according to the scent of each” (B67).²⁵ Not only are day and night and the others the same insofar as they are poles of the same cycles, but the cycles are themselves manifestations of *God*. The ultimate nature of things is in itself the unchanging unity of all oppositions, and changes only in its manifestations, just as a river is itself an enduring entity despite its internal flow.

The perfumes in the analogy, which, when mixed with fire, give their name to it, seem to be a metaphor for the moments of time. All finite things exist at their appropriate time, after which they are replaced by others.²⁶ Thus Heraclitus speaks of “the seasonable times (ῥαῖς) which

24. The idea of the same things being transformed not only from life to death but also from death back to life, and not only from young to old but also from old back to young, is often taken to be a reference to reincarnation, which it may be. But it may also be a reference to the material elements that alternate between living and dead bodies, and in the same way between old and young ones.

25. Emphasis added. “Fire” is McKirahan’s insertion based on Diels’s conjecture. Oil, air, water, and wine have been other proposals. “Fire” has the advantage of alluding to Heraclitus’ conception of fire as the elemental universe as a whole (B69), but the point is the same any of the conjectures.

26. Some fifty years earlier Anaximander had written: “The things that are perish . . . according to necessity, for they pay penalty and retribution to each other for their injustice in accordance with the ordering of time” (DK 12B1). Taking the perfumes to refer to moments in time is not open to the objection Kahn raises against interpreting the metaphor as fire and incense, namely that, unlike the whole and its parts, “the altar flame is of course distinct from the incense or spices that are thrown upon it.” See Kahn, *Thought and Art*, 280, who offers an alternative reading of the fragment.

bring everything” (B100),²⁷ and says, “The sun will not overstep his measures; otherwise, the Erinyes, ministers of Justice, will find him out” (B94). Accordingly, when Heraclitus compares God to fire that is named according to the incense being burned in it, the point is that we name the unnamable whole according to its present condition (day or night, winter or summer, war or peace, satiety or hunger). God in itself is unchanging and timeless, but seen at particular times appears as one state or another. At rest, it is changing.

What B67 said about cycles, B62 says about individuals: “Immortal mortals, mortal immortals, living the death of the others and dying their life” (B62). Heraclitus’s God is immortal because beyond change and time; but because all things are God, God also coincides with what is mortal, changing, and temporal. If we think away time, all things disappear into God, while if we look at things temporally, God disappears into all things, like Spinoza’s distinction between *natura naturans* (God) and *natura naturata* (the natural world). Each lives the death of the others and dies their life: “out of all things comes a unity, and out of a unity all things” (B10). Thus Heraclitus can say both that “all things are one” (B50) and also that “that which is wise is set apart from all” (B108). It is set apart not as an exception to the oneness of all things, but as the atemporal oneness of all that is temporal.

III

If all is one, and all personal values are arbitrary, and the most beautiful order is a pile of things poured out at random, what is the point of moral effort? Whatever we do, it is all one and the same, a temporal manifestation of God, so why not take the path of least resistance and do whatever we feel like? If all things happen in accordance with the *logos* (B1), and all things are steered through all things by an intelligence (B41), and to God all things are beautiful, good, and just (B102), and every day is as good as every other day (B106), then it seems that everything we do is equally good and our moral choices are effectively meaningless. This is not the conclusion that Heraclitus draws, but we need to understand how he can avoid it.

27. A different kind of interpretation has been suggested by Reinhardt, “Heraclitea,” 228–35. Also see Kirk, *Heraclitus*, 294–305, and Kahn, *Thought and Art*, 155–56.

His description of wisdom as “to know the intelligence by which all things are steered through all things” (B41), and of the *logos* as that by which all things come to be (B1), suggests that there is in fact some rationale for the way things happen, and several fragments testify to the importance of achieving and living in accordance with this wisdom. Thus, “Right thinking (*σωφρονεῖν*) is the greatest virtue, and wisdom is to speak the truth and act in accordance with nature” (B112). Conversely, “Justice will convict those who fabricate falsehoods and bear witness to them” (B28). How then could Heraclitus believe that to God all things are beautiful and good and just? He seems to contradict that statement explicitly when he says that “most people are bad, and few are good” (B104).²⁸ This is one of the central paradoxes of Heraclitus’s thought. On the one hand, from the point of view of the whole all things are good, all are constituent parts of a divine harmony. On the other hand, Heraclitus continually urges us to live a certain kind of life and has no patience with those who do not see things as he does. He said that “Homer deserved to be expelled from the contests and flogged, and Archilochus likewise” (B42), and elsewhere he speaks abusively not only of Homer (B56), but also of Hesiod (B40, B57), Pythagoras (B40, B129), Xenophanes (B40), and Hecataeus (B40), as well as people in general (B29, B70, B104, B121).

In order to see how he can say that all is good, on the one hand, and that most people are bad, on the other hand, we have to understand his conception of our distinctive human potential—our rational mind. We saw earlier that thinking, unlike our appetites, enables us to rise above our partial point of view and discover the impartial perspective that is common to all things (B113). To the extent that our thinking succeeds in rising above partiality, we awaken to the *logos* that is common to all (B2) and thus within ourselves (B45, B115), and in accordance with which all things come to be (B1). To be a good person in Heraclitus’s sense is to achieve this awakening. There are two aspects to our nature, then, corresponding to the difference between the divine and human natures mentioned in B78: On the one hand, our rational common nature that can rise above particularity and grasp the eternal, and on the other hand, our unique individuality that is wedded to ever-changing particularity. Insofar as our individual nature is part of a whole that is thoroughly good our

28. B133 says similarly, “Bad people are adversaries of true ones,” but is not considered authentic.

individuality contributes to the greater good no matter what we do, and in that sense all things and all people are good. Even the divisive actions of a selfish person contribute to an overall good, the way “[t]he path of writing is straight and crooked” (B59)²⁹—that is, however much the individual elements may zig and zag, they contribute to the overall movement forward. Similarly, “A person’s character is his divinity” (B119)³⁰ means that each of us in our own way, regardless of what kind of character we have, manifests the divine nature. Thus Heraclitus says of people who are still asleep to what is common, “Sleepers are co-workers in what goes on in the world” (B75). These are people who contribute to the good of the whole despite themselves, who are good not in themselves but only because their actions have beneficial ramifications that they neither foresee nor intend. But those who live rationally, by the thinking that is common to all, contribute to goodness not only indirectly and unknowingly like the others, but also directly and knowingly by embodying within themselves and within their lives the rational principle of the whole. Everyone is good in a merely natural sense, as part of the goodness of the natural world, but we are good in the moral sense, and our life is intrinsically meaningful, only to the extent that our thinking has awakened from the partial to the common, and our mind identifies itself with the whole rather than with the part that is our individual body.

But how can selfish, brutal, and destructive actions possibly be necessary for the goodness of the whole? Does such a view not trivialize human suffering? Heraclitus is not unaware of the paradoxical nature of this view, and in fact he insists on it: “They do not understand how, though at variance with itself, it agrees with itself. It is a backwards turning harmony like that of the bow and the lyre” (B51). Just as a bow and lyre reconcile within themselves the inward pull of the string with the outward pull of the frame, the world as a whole reconciles within itself the disparate tendencies of each of its parts to go their own way in opposition to each other. That was what he meant by saying, “The most beautiful world-order is a pile of things poured out at random” (B124). At the

29. An alternate reading, “The path of carding wheels is straight and crooked,” is defended by Kirk, Marcovich, and Kahn, although the present reading is defended also by Guthrie and Robinson. On either reading the point is the same.

30. The word translated as “divinity” is *δαίμων*, as in B79: “A man is called infantile by a divinity (*δαίμωνος*) as a child is by a man.”

level of individuals everything is arbitrary and random, but that same totality seen as a whole constitutes an order and harmony.³¹ That is not apparent to us normally, but “[a]n unapparent harmony is stronger than an apparent one” (B54). In other words, things which at the level of individuals are destructive and divisive constitute at the level of the whole a cosmic harmony.

As “harmony” is the word for the way all things are related to one another at the level of the whole, the word for the way they are related to one another at the level of individuals is “strife”: “What is opposed brings together; the finest harmony is composed of things at variance, and everything comes to be in accordance with strife” (B8). Heraclitus not only does not trivialize individual suffering, he insists on it: “Homer was wrong to say ‘Would that strife might perish from among gods and men.’ For if that were to occur, all things would cease to exist” (fragment 43 [Bywater]).³² Thus, “War is the father of all and king of all, and some he shows as gods, others as humans; some he makes slaves, others free” (B53). The strife that carves our individuality out of the whole reveals the distinctive character that is our divinity.

Two of the terms that Heraclitus used to characterize the harmony of the whole were “justice” and “common.” Now he says, “It is necessary to know that war is common and justice is strife, and that all things happen in accordance with strife and necessity” (B80). To say that war is common is to say that what divides us also unites us, and to say that justice is strife is to say that what unites us also divides us. Finally, to say that all things happen in accordance with strife and necessity is to say that the strife that divides us is a necessary feature of the reality as a whole that we share in common. This view is not as counterintuitive as it may seem.³³ Not only do we find it in Darwin’s conception of evolution through warlike competition, but our own experience teaches that without challenge our society, and we ourselves, are likely to become complacent and stagnant, our vitality replaced with unreflective conventions

31. Cf. B8 (“the finest harmony is composed of things at variance”) and B10 (“Things taken together are . . . consonant and dissonant”).

32. Not considered a direct quotation by Diels-Kranz (or McKirahan), but counted as such by Bywater (see Burnet, 132 §65). My translation.

33. It is an example of the dialectical view of the world found in philosophers like Plato, Hegel, and Marx.

and habits, and the harmonious tension of opposition replaced by the repression of one side by another. Heraclitus's metaphors remind us several times that violence is sometimes necessary to benefit us: "Every animal is driven to pasture by blows" (B11),³⁴ people do not appreciate the benefit they receive from being cut and burned by doctors (see B58), and "Even the barley drink separates if it is not stirred up" (B125). There would be no reason for us to rise above the simplest and most elementary modes of thinking about the world and about ourselves if we were never challenged by obstacles—whether the obstacles to our understanding that provoke us to wonder and to reflective thought, or the obstacles to our will that provoke us to rethink our values and our way of doing things. Thus, "Disease makes health pleasant and good, hunger satiety, weariness rest" (B111). Without deprivations like disease we would never have become conscious of benefits like health.³⁵ It is the point he made also in B23: "They would not have known the name of justice if these things [injustices] did not exist." It is not hard for us to appreciate that, without the selfish and divisive behavior of Paris and Helen, the greatness and beauty of the *Iliad* could not exist, or the greatness and beauty of the *Odyssey* without the enmity and challenges that continually test Odysseus. It is more difficult to appreciate in life than in art that without the divisive behavior of individuals the harmoniousness of the whole could not exist, but the underlying principle is the same.

34. Fink, *Heraclitus Seminar*, 32, compares the 9th stanza of Hölderlin's poem "Stimme des Volks" ("Voice of the People"): Und, nicht des Adlers Jungen allein, sie wirft / Der Vater aus dem Neste, damit sie nicht / Zu lang ihm bleiben, uns auch treibt mit / Richtigem Stachel hinaus der Herrscher. [Not only with the eagle's children / Does the father throw them from the nest / Lest they stay too long with him, we too / are driven by the just goad of the ruler.] (My translation)

A similar interpretation can be given to B64. "Thunderbolt steers all things" can be taken metaphorically to mean that violence is essential to the ordering of things. It is, however, one the most variously interpreted of all Heraclitus's fragments. Kirk, *Heraclitus*, 356, interprets the thunderbolt as a reference to elemental fire. Marcovich, *Heraclitus*, 424–25, Kahn, *Thought and Art*, 271, and Robinson, *Heraclitus*, 126, take it to refer to the celestial fire or divine *aether*, Dilcher, *Studies in Heraclitus*, 127, to Zeus's thunderbolt, while Fink interprets it as the lightning flash that "brings to light the multiple things in their articulated gathering" (*Heraclitus Seminar*, 5 and *passim*). Also see Kirk's, *Heraclitus*, 354–57, survey of other interpretations.

35. The point is even stronger if we read κακὸν ἀγαθὸν for καὶ ἀγαθόν, as proposed by Heitz and accepted by Diels and others. In that case it would read, "Disease makes health pleasant, evil [makes] good [pleasant], hunger satiety, weariness rest." But it is better not to emend the text unnecessarily.

However paradoxical, there is nothing unreasonable in Heraclitus's claim that the world may at once be good in itself and distressing in its parts. To be awake in Heraclitus's sense means to hold onto this double point of view, which is our own simultaneous harmony and strife.³⁶ The viewpoint of awakened thinking tells us that the whole is good, and therefore all things taken together are beautiful, just, and good. The practical viewpoint tells us that along this way lie apathy and paralysis of the will. It tells us that some things are better than others, and that we have the responsibility to try to bring about goodness in the world and oppose evil. Heraclitus's philosophy teaches us that we must ultimately recognize not only the harmony of the whole that unifies the strife among the parts, but also the harmony that unifies the strife *between* these two viewpoints, that of the whole and that of the part. According to the first, we must strive to wake up to the understanding that our own place and our own set of values are one among many, all subordinated to the whole. According to the second, we must hold on to the recognition that even if our mind can rise to a god-like perspective of the whole, we are at the same time parts within that whole. We are not an impersonal god, but finite persons with our own part to play within the whole.³⁷ We must do what we think is right, even though others think differently, but we must at the same time recognize that those who disagree with us and oppose us have their own part to play.

We can see this at the level of the city as well as at the level of the individual. Heraclitus recognized the relativity of each city's laws when he said that "all human laws are nourished by one law, the divine law; for it has as much power as it wishes and is sufficient for all and is still left over" (B114). But he also recognized that it is the responsibility of the city to play its part in the world by championing its own laws: "The populace must fight for the law as for the city wall" (B44). What is true of the populace and its law is true of individuals and their principles: we must fight for what we believe in. But at the same time we must also keep in mind

36. Also see Eugen Fink: "a relatedness is articulated between πάντα [all], in the sense of many in entirety, and the one, and a relatedness of the one to the many in entirety" (*Heraclitus Seminar*, 21).

37. Also see Nussbaum, "ΨΥΧΗ in Heraclitus, II," 165: "Ethical judgments are relative, but they must be made; and the recognition of the relative nature of our ethical terms should not trick us into believing they are meaningless."

that the words of B110 also apply to us: “It is not better for humans to get all they want”; and that the tension of antagonism and strife is the other side of harmony. This is not a relativism. The awakened perspective that sees the limitations of any finite point of view and aims at the unification of harmony, is always superior to the personal point of view that sees only its own advantage and pursues the divisiveness of competition. The personal point of view is not equally good or equally fulfilling where it does not coincide with the transpersonal view. Selfish behavior is not as good as enlightened behavior. But it is equally necessary.

4 ∞ Reason and Myth in Early Pythagorean Cosmology

I. INTRODUCTION

Scholarship on the emergence of rationality in early Greek thought has focused on two main topics. First, there is the movement from the explanation of the natural world in terms of persons, i.e., gods, to explanation in terms of impersonal natural materials, i.e., elements such as water and air. This movement is also accompanied by a shift from explanation in terms of the irrational and often inscrutable desires of the gods, particularly the desire for reproduction, to explanation in terms of unbreachable regularities, i.e., natural laws, which are completely accessible to reason and supported by appeals to experience. This first topic in the study of Greek rationality has centered on the transition from Hesiod to Ionian philosophers such as Anaximenes. Hesiod provides a simultaneous generation of the gods and the world, a theogony and a cosmogony at once. The fourth god to be born in Hesiod's *Theogony* is Eros, the god of sexual passion, who "overcomes the mind and prudent council in the breasts of all gods and men" (*Theogony* 121–22). Eros's dominion ensures that the account of the world that follows in Hesiod, although being quite systematic in many aspects, will nonetheless employ passion rather than reason as the primary means of explanation. The sexual passion of Earth and Heaven will lead to the birth of Ocean; Cronus's anger and desire to please his mother Rhea leads to the castration of his father Ouranos, from whose blood are born the spirits of vengeance known as the Furies, as well as, oddly enough, ash trees (*Theogony* 131–32 and 173–85). By con-

trast, Anaximenes argued that the world began, not from a person, but from air and that all things are generated from air, not by sexual passion or revenge, but by the completely regular process of condensation and rarefaction. When air is rarefied, it becomes fire; when cooled, it becomes first wind, then cloud, then water, then earth, and finally stone (DK 13A5).¹ The second main topic in the study of early Greek rationality, which I will describe more briefly, has been the emergence of rigorous methods of argumentation, such as Parmenides's deductive arguments about the nature of "what is," in the first part of his poem.

Recent scholarship, however, has been quick to emphasize that the transformation of mythical accounts of the cosmos was gradual and that the distinction between myth and reason is not absolute. On the one hand, there is a considerable amount of reason (*logos*) in mythical cosmogonies such as that of Hesiod; on the other hand, the rational explanations of the Presocratic philosophers preserve some of "the scaffolding," as Burkert has put it, of the earlier mythical accounts.² Burkert argues persuasively that to imagine the original state of the world as the antithesis of the developed world, as what has "not yet" become the world, is an achievement of speculative reason, of *logos*. Such a use of *logos* is found in mythical cosmogonies such as Hesiod's *Theogony*, which begins with an empty gap, as well as in Presocratics, such as Anaximander, who postulates the *apeiron*, the unlimited, as the starting point for cosmogony.³ Furthermore, while Hesiod's cosmogony does not assign a central role to a divine craftsman, Orphic theogonies evidently did, since the theogony that is the subject of the commentary in the Derveni papyrus gives Zeus a role in fashioning the world (Pap. Derveni col. 23.4). This is, strictly speaking, a non-rational explanation, since it appeals to the action of a person rather than to impersonal laws, but it is a characteristic that a number of rational Presocratics were unable to do completely without;⁴ Empedocles makes Love a creative power; Anaxagoras needs Mind to start the motion from which the world arises (DK 59B13), while Parmenides has "a goddess who steers all things" (DK 28B12). However, even

1. For an excellent account of Anaximenes's theory and the contrast between the Ionians and Hesiod, see Graham, *Explaining the Cosmos*.

2. Burkert, "The Logic of Cosmogony," 104.

3. *Ibid.*, 92.

4. *Ibid.*, 96–97.

those scholars who have emphasized that the story is more complex than the simple dichotomy between myth and reason suggests agree with the widespread consensus that “there was a unique development that brought about Greek philosophy and science, something which arose nowhere else and at no other time in just this form.”⁵ My purpose in this paper is to examine what role Pythagoras and the Pythagoreans played in this development.

Some readers might think that I have a rather easy task in illustrating Pythagoras’s contribution. Guthrie, in the first volume of his great *History of Greek Philosophy*, published in 1962, tells us that Pythagoras was “a founder of mathematical science and philosophical cosmology.” Although he emphasizes that “religious and superstitious beliefs” were also present in Pythagoras’s school, he maintains that these were combined with the “rational pursuit of mathematical science and cosmic speculation.”⁶ Surely then, as a great mathematician, who had proven the central geometrical theorem that bears his name, he must have made a decisive contribution to the development of rigorous methods of argumentation. What is more rigorous and rational than a mathematical proof? Again, in light of his role as a cosmologist who explained the cosmos in terms of mathematical laws, as evidenced by the famous doctrine of the harmony of the spheres, it might appear obvious that Pythagoras was a central figure in formulating rational explanations of the cosmos in terms of impersonal regularities. What is more regular or impersonal than a mathematical equation?

However, the last fifty-five years of scholarship on Pythagoreanism have shown that such a view of Pythagoras is almost certainly wrong. If you have not been reading that recent scholarship on Pythagoreanism you are very likely to have ideas about Pythagoras that are mistaken. This can be seen clearly by referring to a recent undergraduate text in Greek civilization by two very distinguished classicists, Ian Morris and Barry Powell. It is an admirable text in many ways, but it shows little awareness of the last fifty years of scholarship on Pythagoras. For instance, we are told that Pythagoras was a great mathematician, who was responsible

5. *Ibid.*, 104. See also Bremmer, “Rationalization and Disenchantment,” who says that “the gradual advance of philosophical and scientific thought in Greece has been well documented and accepted . . .” (72).

6. *HGP*, vol. I, 181.

for the Pythagorean theorem and thought that “mathematics was a way to comprehend” the order of the universe. They go further and state that Pythagoras was responsible for “the application of scientific abstractions to society as well as to nature.”⁷ Guthrie is listed in their bibliography to the chapter, and a close reading of what they say suggests that they are relying heavily on him.

In the same year that Volume I of Guthrie’s *History of Greek Philosophy* appeared, Walter Burkert published his epoch-making study of Pythagoreanism, which was translated into English by Edwin Minar and was published by Harvard University Press in 1972 under the title *Lore and Science in Ancient Pythagoreanism*. Burkert shows quite conclusively that, in the early evidence for Pythagoras, the evidence down to c. 350 B.C., some 150 years after Pythagoras’s death, there is no trace of Pythagoras as a mathematician, a master metaphysician, or a propounder of a rational cosmology. In fact, even Guthrie had conceded that this was what the early evidence showed.⁸ Guthrie, however, opened the flood gates again by arguing that Pythagoras must have been a mathematician and cosmologist, despite the lack of early evidence, because this is the only way to explain such an image of him in the second and third centuries A.D., in the lives of Pythagoras by Diogenes Laërtius and Porphyry and in Iamblichus’s *On the Pythagorean Life*.⁹ Guthrie does not face a central problem with his reliance on this argument: if we suppose Pythagoras was what these works of the second and third century A.D. present him to be, Plato’s and Aristotle’s reaction to him become totally inexplicable. It is common to claim massive Pythagorean influence on Plato, but less common to notice that Plato mentions Pythagoras exactly once in his voluminous writings and not as a mathematician or cosmologist but as the founder of a way of life (*Republic* 600a). Aristotle’s extant works are even more stingy in references to Pythagoras, which

7. Morris and Powell, *The Greeks*, 175.

8. He refers to “the silence of our early sources on Pythagoras as a philosopher and mathematician.” *HGP*, vol. I, 168.

9. These are Diogenes Laërtius, *Lives and Opinions of Eminent Philosophers*, VIII (henceforth D.L.); Porphyry, *Vita Pythagorae* (henceforth “Porphyry, VP”); and Iamblichus, *De vita Pythagorica* (henceforth “Iamblichus, VP”). Guthrie, *HGP*, vol. I, comments that “all the later biographical writers show him as such” (168) [i.e. a philosopher and mathematician] and argues that “his character as . . . a founder of mathematical science and philosophical cosmology . . . must be assumed as the only reasonable explanation of the unique impression made by his name on subsequent thought” (181).

means of course that he never refers to him.¹⁰ Although Aristotle made a point of surveying the views of his predecessors, notably in Book 1 of the *Metaphysics*, he says nothing about Pythagoras in his surveys of earlier accounts of the cosmos. Aristotle did discuss Pythagoras directly in his lost works on the Pythagoreans (Aristotle fragment 191 [Rose³]), but the fragments of those works provide no evidence for Pythagoras as either a mathematician or a rational cosmologist.¹¹

There is not space here to rehearse all the arguments for Burkert's brilliant reassessment of Pythagoras, but the evidence of Plato and Aristotle should be enough to cast grave doubt on the canonical account of Pythagoras as it is represented in Guthrie's history. When it comes to Pythagoras, then, my task turns out to be quite difficult, since the evidence is that he was primarily an expert on religious ritual and the fate of the soul after death. He promulgated a doctrine of reincarnation and was a founder of a way of life that presumably was in accord with his religious beliefs and his theory of the soul. This way of life included what appear to be a bewildering hodgepodge of irrational taboos, such as not to stir a fire with a knife (Porphyry, *VP* 42), not to speak in the dark (Iamblichus, *VP* 84), and, more colorfully, not to urinate in the direction of the sun (Iamblichus, *Protrepticus* 124.1). Nonetheless, I will argue that Pythagoras's beliefs about the fate of the soul do indeed presuppose a cosmology that is of considerable interest. The question is whether there is anything about this cosmology and Pythagoras's beliefs in these areas that constitute a contribution to the emergence of rationality in Greek thought.

If we have to give up on Pythagoras as a great mathematician and rational cosmologist, we do not have to give up on the Pythagoreans. Philolaus of Croton, who was active some fifty to seventy-five years after the death of Pythagoras, does indeed produce a cosmology that has claims to be rational, in part because he explicitly asserts that the world can be

10. *Metaphysics* A.5.986a29 is probably an interpolation and *Rhetoric* B.23.1398b14 is a quotation from Alcidas. *Magna Moralia* A.1.1182a11 may be a case in which Pythagoras has replaced Pythagoreans in the manuscript tradition, but in any case it seems unlikely that the *Magna Moralia* is by Aristotle.

11. Fragment 191 of Aristotle is drawn from Apollonius's *Miraculous Stories*. All fragments from Aristotle are drawn from Rose³, *Aristotelis Fragmenta*, 3rd ed. In the passage that leads up to the quotation from Aristotle, Pythagoras is described as working on mathematics and number but, as Burkert, *Lore and Science in Ancient Pythagoreanism*, 412, has shown, this is a transitional comment by Apollonius and not part of the quotation from Aristotle.

known only through mathematics (B4). Another fifty years after Philolaus we get the first Pythagorean who was a master mathematician, Archytas of Tarentum, whose dazzling solution to the problem of the duplication of the cube survives.¹² In what sense Philolaus and Archytas should be called Pythagoreans is a delicate question. They were clearly called Pythagoreans in the time of Plato and Aristotle, but Aristotle was uncomfortable applying the name to Philolaus and his contemporaries, calling them the “so-called Pythagoreans.” Aristotle also wrote three books on Archytas, which were separate from his works on the Pythagoreans. Archytas is a contemporary of Plato and hence clearly beyond the scope of early Greek philosophy and my focus in this essay. Philolaus, on the other hand, is a little older than Democritus and thus clearly belongs among the Presocratics.

The central questions that I want to address in the remainder of my paper are, then: What is the nature of the cosmology that is presupposed by the way of life that Pythagoras founded? Are there any connections between this cosmology of Pythagoras and the later cosmology of Philolaus? Does either of these cosmologies mark a contribution to the development of rationality in Greek thought? My thesis is that the transition between the cosmology of Pythagoras and the cosmology of Philolaus provides us with a particularly good example of the transition from a primarily mythical to a primarily rational cosmology. Thus my topic is not the much-studied transition from Hesiod to Ionian rationalism, but rather the transition from myth to reason in Pythagoreanism itself. I also hope, in this way, to cast light on the vexed question of the relationship between Pythagoras and his successors.

II. THE COSMOLOGY OF THE PYTHAGOREAN ACUSMATA

In order to get further details about Pythagoras’s beliefs concerning the soul and the way of life founded on them, a serious problem must be overcome. Most scholars agree that Pythagoras wrote nothing. Thus, there would appear to be no primary texts for us to consult in order to gain any sort of in-depth appreciation of Pythagoras’s thought. A num-

12. See Huffman, *Archytas of Tarentum*.

ber of brief maxims known as *acusmata* or *symbola* have been preserved, however, and there is reason to believe that some of these may go back to Pythagoras himself.¹³ One of the names applied to them, *acusmata*, literally “things heard,” suggests that they were originally not written down but given orally by Pythagoras to his followers. They may, however, have been written down relatively early. Heraclitus, who is some thirty years younger than Pythagoras, reports that “Pythagoras, son of Mnesarchus, engaged in inquiry most of all men,” but goes on to accuse him of plagiarism, saying that his wisdom was nothing more than a selection of things learned from others. He describes what Pythagoras selected as “these things which have been written up.” Scholars have been puzzled by Heraclitus’s use of the demonstrative “these” here, which seems to indicate that the things written up are well known in some way. I have argued elsewhere that the reference may be precisely to the *acusmata* and thus indicate that collections of them were already circulating in Heraclitus’s time.¹⁴ At the latest, the first collection must date before 400 B.C., when Anaximander of Miletus wrote a book explaining them. A number of them are preserved in the fragments of Aristotle’s special works on the Pythagoreans. A particularly important description of the *acusmata* is found in sections 82–86 of Iamblichus’s *On the Pythagorean Life*; it is very likely that these sections are based on Aristotle. Here the *acusmata* are classified according to the three sorts of question they answer. *Acusmata* of one type answer questions of the form “What is most x?” for example “What is the most just thing? To sacrifice” or “What is wisest? Number.” *Acusmata* of another type specify what must be done, and here we find some of the lifestyle restrictions, guidance in religious ritual and dietary rules that evidently governed the Pythagorean way of life, such as “one must beget children” or “one must not sacrifice a white cock” (Iamblichus, *VP* 83–84) or, most famous of all, “abstain from beans” (D.L. 8.34).

For the purposes of my paper, however, it is the third type of *acusmata*, the ones that answer the question “What is X?” that are most interesting, since some of them focus on cosmology. Other *acusmata* may have cosmological implications, but I will focus on the following ten, which are explicitly cosmological, without claiming that my list is exhaustive:

13. For a full discussion of the *acusmata* see *ibid.*, 166–92.

14. See Huffman, “Heraclitus’ Critique of Pythagoras’ Enquiry in Fragment 129.”

1. What are Islands of the Blessed? Sun and moon. (Iamblichus, VP 82)
2. The planets are the hounds of Persephone. (Porphyry, VP 41)
3. The big and little bear are the hands of Rhea. (Porphyry, VP 41)
4. The Pleiades are the lyre of the Muses. (Porphyry, VP 41)
5. The sea is a tear of Cronus. (Porphyry, VP 41)
6. An earthquake is a mass-meeting of the dead. (Aelian, VH 4.17)¹⁵
7. Thunder is to threaten those in Tartarus so that they will be afraid. (Aristotle, *Posterior Analytics* B.11.94b33)
8. The rainbow is the light of the sun. (Aelian, VH 4.17)
9. The noise from struck bronze is the voice of one of the *daimones* shut up in the bronze. (Porphyry, VP 41).
10. The ringing heard in the ears is the voice of the heroes (*kreittones*). (Aelian, VH 4.17)

It is very likely that all of these texts derive ultimately from Aristotle's collection of *acusmata* in his special works on the Pythagoreans.¹⁶ Nonetheless, we cannot be certain that any of them goes back to Pythagoras himself. As we have seen, however, they go back at least as far as the fifth century, and their content matches Pythagoras's interests as indicated by the early evidence, so I will speak of them as reflecting Pythagoras's own thought. What sort of a cosmology, then, does Pythagoras provide in these ten texts?

In order to answer this question, it is important to remember the cosmology of Pythagoras's Ionian predecessor Anaximenes, which I have described above, and also to note the explanation of specific phenomena in the cosmos by Pythagoras's contemporary Xenophanes. Xenophanes's explanations of specific natural phenomena also appeal to impersonal matter and natural processes and involve an explicit repudiation of mythological accounts of the same phenomena. This is true in the case of the rainbow, which in Greek has the same name as a goddess, Iris. In fragment DK 21B32, Xenophanes says "that which men call the goddess

15. Aelian, *Varia Historia* (henceforth VH).

16. One is from the *Posterior Analytics*, where Aristotle is drawing on his own research. Porphyry, from whose *Life of Pythagoras* five of the texts come, explicitly cites Aristotle as his source, and there is good reason to believe that Iamblichus and Aelian, who provide the four remaining texts, are drawing on Aristotle as well. See Burkert, *Lore and Science in Ancient Pythagoreanism*, 166–68.

Iris, this too is by nature cloud, that looks purple and red and yellow.” Thus, the rainbow that we see is not to be explained in terms of the person Iris, but rather in terms of a natural substance, cloud, and a regular mechanical process, the reflection of light on cloud. The doxography tells us that Xenophanes gave a similar explanation of the phenomenon known as St. Elmo’s fire, according to which the rigging on ships appears to glow or be on fire in certain atmospheric conditions. The passage reads: “Xenophanes says that what appears to be fires on ships, which some people call the Dioscuri, are clouds glimmering because of a certain motion” (DK 21A38). Again a phenomenon that some regarded as the presence of the Dioscuri, the heroes Castor and Pollux, is explained by Xenophanes as due to the motion of a natural substance, cloud.

Is Pythagoras doing anything like this in the cosmological *acusmata*? Riedweg, in his recent book on Pythagoras, has argued that he is.¹⁷ Riedweg says that these *acusmata* “decode the true, real meaning in a (figurative) mythical mode of expression”; in them Pythagoras “explained the mythological elements ‘rationally’ in terms of his philosophy of nature.”¹⁸ Thus, the first of the ten *acusmata* in the list tells us that the Islands of the Blessed referred to in Greek mythology are nothing mysterious; they are just a figurative way of referring to the sun and the moon. But is this an explanation at all? Riedweg says that Pythagoras is giving explanations in terms of his philosophy of nature, but this cannot be, since nowhere in the evidence for Pythagoras is there a hint of any systematic philosophy of nature. There is no account of how the sun and moon behave or what they are composed of. We are not told that they are a form of air or fire or some other basic material. Nor is it the case that we have a phenomenon, such as the rainbow, that was earlier explained in a mythical way and is now explained in terms of matter and natural law. Instead, items from myth, the Islands of the Blessed, are equated with items from the natural world, the sun and the moon. Riedweg starts with this example, because in it the mythical item comes first and the item from the natural world second, so that it appears that the second might be an explanation of the former. In most of the other *acusmata*, however, it is the item from the natural world that comes

17. See also Bremmer, “Rationalization and Disenchantment.”

18. Riedweg, *Pythagoras*, 74.

first, followed by the item from myth (e.g. number 2, “The planets are the hounds of Persephone”). Of course, we cannot be sure that the formulations in which these *acusmata* are preserved are the original ones, and it would be possible to turn the statement that the planets are the hounds of Persephone into a question in which the mythical element comes first, e.g. “What are the hounds of Persephone? The planets.” The order of the elements is not the central issue, however. Even if we take the mythical element first, the second, natural element does not provide an explanation. Instead these *acusmata* provide a series of equations of items in the mythical world with items in the natural world. The point is not that one realm, the realm of physical bodies, is more basic than the other, so that myth is rationalized in terms of the physical realm; rather the mythical world and the physical world are being mapped onto each other.

Riedweg goes on to suggest a parallel with mystery religions, such as the Eleusinian mysteries, where initiates find out that, in the myth of Demeter’s search for her lost daughter Persephone, Demeter is equated with the earth and Persephone with grain. I agree with Riedweg that this is a good parallel for the Pythagorean *acusmata* on the cosmos, but I disagree with his interpretation of what is going on in the Eleusinian mysteries. Surely in the mysteries there can be no attempt to explain away Demeter and Persephone by replacing them with earth and grain. It would be an odd religious ritual, the purpose of which was to debunk the divinities on which the ritual is based. Demeter and Persephone are still very much the object of belief and ritual. The goal of the revelation in the mysteries is to show that they are divine forces that have power in the crucial part of human life having to do with the production of grain from the earth and are therefore worthy of our worship. The goal is not to show that we can do away with the divinities by realizing that they are really just earth and grain but rather to make use of their influence over these important parts of our life. As Burkert puts it, “allegory in the mysteries . . . [opens] up the magical dimension of influencing the periodic powers of life through ritual.”¹⁹

Nine of the ten *acusmata* equate an item from mythology with a natural phenomenon or part of the natural world, but, as I have shown, the goal is not to explain away or rationalize the mythical item. The mindset

19. Burkert, *Ancient Mystery Cults*, 81.

displayed in these equations can be seen even more clearly in Aristotle's quotation of one of them, number 7: "Thunder is to threaten the souls in Tartarus so that they will be afraid." In the passage from the *Posterior Analytics* from which this *acusma* comes, Aristotle is distinguishing two sorts of causes in nature. He gives as an example that "it thunders both because when fire is quenched it is necessary that it hiss and make a noise, and as the Pythagoreans say, in order to threaten those in Tartarus so that they will be afraid" (*Posterior Analytics* B.11.94b32–34). One of these is a naturalistic explanation similar to those of Xenophanes discussed above, which relies on the natural properties of fire. Evidently, lightning is envisioned as being quenched by rain, thereby producing thunder. Aristotle clearly contrasts this sort of explanation in terms of necessity, i.e., in terms of the necessary properties of physical elements, with the Pythagorean explanation in which thunder serves a purpose, the purpose of frightening the inhabitants of Tartarus, where, as we know from Hesiod, Zeus kept imprisoned the most dangerous malefactors, including the Titans (*Theogony* 687–735). Thus, Pythagoras's explanation of thunder is religious and teleological rather than naturalistic.

It seems to me that Aristotle's reading of the case of thunder is the key to reading all of the cosmological *acusmata*. It is, in fact, possible to construct from them a very coherent mythical/religious cosmology, whose purpose is to reinforce certain religious and moral values connected with Pythagoras's views on the fate of the soul. West does an excellent job of showing this in the following passage:

The sun and the moon are the Isles of the Blessed, i.e., where the souls of the dead most desire to arrive; but there are also the planets, Persephone's dogs, which we must suppose to have the office of Cerberus, guarding the passage and devouring souls or turning them away. . . . Some of the dead, then, loiter in the lower air; their voices are to be heard in the ringing of the ears. Others are in Tartarus below the earth. Earthquakes occur when they hold their conventions, and thunder is a warning to them.²⁰

West has woven together five of the cosmological *acusmata* here. Riedweg himself notes some other connections at the mythic level. Cronus and Rhea, who play an important role in Orphic theogonies, are the rul-

20. West, *Early Greek Philosophy and the Orient*, 215–16.

ing couple in the generation before Zeus and Hera. Riedweg speculates that “Rhea’s hands,” which are equated with the big and little bear, “refer to the trick by means of which she prevented Kronos from swallowing up Zeus.”²¹ He refers to the line in the *Theogony* where Hesiod says of Rhea, “With her hands she took him and hid him in a deep cave” (*Theogony* 482–83).²² At any rate, Cronus and Rhea are connected to the other *acusmata* in that they are some of the malefactors in Tartarus who are kept in line by the threat of Zeus’s thunderbolt.²³ It is thus clear that Pythagoras saw a world charged with moral meaning. Thunder has a moral purpose, as do the planets. If Pythagoras’s followers take seriously the *acusmata* that they receive from the master, everywhere they look in the world they will see evidence of the crucial importance of living their lives in a way that will insure their arrival at the Islands of the Blessed. The cosmos has an order that is given by a religious purpose having to do with the fate of the soul. It is hard not to notice a similarity with the type of cosmological structure that Plato constructs at the end of the *Republic* for much the same purpose.

Could we not suppose that the *acusmata* are meant to provide both a mythical and a naturalistic account of the world? Riedweg seems to suggest something of the sort.²⁴ There would be nothing impossible in this and, as I will show below, Philolaus may combine both elements. The difficulty in the case of the cosmology implied by the *acusmata* is that, while a rich and coherent mythological structure can be derived from them, as has just been shown, no coherent theory of natural philosophy emerges. No central elements or processes are identified, nor is there a clear cosmological ordering of natural bodies. There are just references to parts of the natural world. Riedweg lists the parts of the world to which the *acusmata* refer (the sun, moon, etc.) and then says that they “imply that Pythagoras developed a relatively systematic explanation of the world such as we find . . . in the Milesians, Anaximander and Anaximenes.”²⁵ But a list of parts of the world does not constitute a system.

21. Riedweg, *Pythagoras*, 75.

22. Is the sea, which is called a tear of Cronus in the *acusmata*, meant to remind us of his weeping at being dispossessed of power, as Riedweg suggests (*ibid.*, 75), or even at being castrated by his son?

23. *Ibid.*, 76.

24. *Ibid.*, 75–76.

25. *Ibid.*, 76.

The system all comes from the mythical side, from Pythagorean eschatology, and Riedweg provides no evidence that Pythagoras had a systematic doctrine of nature like Anaximenes's account of the cosmos in terms of air and the process of condensation and rarefaction.

A holdout for the rationalizing interpretation of Pythagoras's cosmos has one last refuge. One of the *acusmata* quoted above is quite different from the rest, in that it does not equate an item of myth with a phenomenon in the natural world but instead appears to explain one of the phenomena in a naturalistic way. This is number eight, which says that "the rainbow is the light of the sun." On the surface this seems to be giving the same sort of explanation of the rainbow that Xenophanes did; Riedweg argues that it illustrates Pythagoras's interest in a scientific cosmology.²⁶ The failure of this *acusma* to fit the clear pattern found in the other nine is puzzling, however. Why in this case alone do we find Pythagoras giving a rationalizing explanation? A look at the *apparatus criticus* to the passage in Aelian suggests a startling resolution to the puzzle.

The entire second part of the *acusma*, "the light of the sun," is an emendation by the sixteenth-century editor of Aelian, Gesner. The apparatus in the standard modern edition of the text by Dilts shows that the manuscript reading is quite different. The manuscripts read, "Iris is the earth of the Nile." At first sight, this appears to be nonsense. What has the Greek goddess Iris, or the rainbow, got to do with the earth of the Nile? As a result, Gesner's emendation is accepted by every scholar whom I have consulted, including those who have discussed the *acusmata* in most detail, such as Burkert and Delatte.²⁷ Nonetheless, there are two major problems with it. First, as we have seen, the *acusma* that results does not fit the pattern of the rest of the *acusmata* and is the sole example of a rationalizing explanation of a natural phenomenon.²⁸ Second, the change to the text, while less radical in Greek than in English, is still significant. There is a much simpler way of restoring sense to the text, which results in an *acusma* that fits the pattern of the other *acusmata*. Only one letter needs to be changed, but the change comes in the

26. *Ibid.*, 75.

27. Burkert, *Lore and Science in Ancient Pythagoreanism*, 170, and Delatte, *Études sur la Littérature Pythagoricienne*, 277.

28. Delatte, *Études sur la Littérature Pythagoricienne*, 277, notes that the scientific explanation found in the *acusma* is "assez rare."

first part of the sentence, not the second. The goddess in question is not Iris but rather the Egyptian goddess Isis. The *acusma* thus says that “Isis is the earth of the Nile,” and is thus an equation of a figure from mythology with a part of the natural world as in the other *acusmata*.²⁹ There is a striking confirmation that Isis was regarded in this way by the Egyptians. Plutarch, in his work *On Isis and Osiris*, reports that the Egyptians “believe the earth to be the body of Isis, not all of it but so much of it as the Nile covers, fertilizing it and uniting with it.”³⁰ Pythagoras is following the Egyptians in equating Isis with the earth of the Nile, just as the Greeks equate Persephone with grain. All ten cosmological *acusmata* thus show that Pythagoras’s cosmos gained its coherence from mythology relevant to the fate of the soul rather than from natural science. But it is now time to ask what became of this sixth-century cosmology of the *acusmata* by the end of the fifth century and to what extent a more rational cosmology emerges.

III. THE COSMOLOGY OF PHILOLAUS

Pythagoras’s cosmology as found in the *acusmata* is a reconstruction by modern scholarship and is not described as a whole by any ancient source. Yet Aristotle and his pupil Theophrastus, as well as the later Aristotelian commentators who explicitly draw on Aristotle’s lost treatises on the Pythagoreans, describe in some detail the cosmology of Philolaus of Croton.³¹ Until the second half of the twentieth century the fragments of Philolaus’s book were neglected because of questions of authenticity. Scholars now commonly accept, however, that a core of the fragments and *testimonia* reflect Philolaus’s genuine book. Two of the genuine fragments are explicitly cosmological and are our best guide to the nature of Philolaus’s cosmology. But in order to understand this cosmology, it

29. I argue for this emendation of the text in more detail in a forthcoming paper.

30. Plutarch, *Moralia*, 366a.

31. Aristotle ascribes the cosmology to fifth-century Pythagoreans as a group, dating them to the time of the atomists or a little before (*Metaphysics* A.5.985b23), which would place their activity in the second half of the fifth century. Theophrastus (*Aetius* II 7.7 and III 11.3 in Diels, *Doxographi Graeci*) explicitly assigns the system to Philolaus, however, and this ascription is supported by the fragments of Philolaus’s book (B7 and B17) so that, while the cosmology may have been adopted by other fifth century Pythagoreans, Philolaus is likely to have been the central figure in its development.

is necessary first briefly to look at the fundamentals of Philolaus's metaphysical system as they appear in the genuine fragments.

In typical Presocratic fashion, Philolaus sets out to explain the natural world in terms of a small set of basic principles. Rather than focusing on stuffs such as water or air, or opposites, such as hot and cold, as his predecessors had, Philolaus proposed that the essential feature of things that make up the cosmos is that they are either unlimiteds—that is, continua that are not defined by any quantitative limits—or limiters—that is, what puts limits in continua. Thus, in the first sentence of his book, Philolaus asserts: “Nature in the world-order was fitted together both out of things that are unlimited and out of things which are limiting, both the world-order as a whole and everything in it” (B₁). Fragment B₆ shows that his model was musical sound, in which the continuum of sound is subjected to a series of limits, which define a scale. In order to establish a scale, the notes cannot be placed just anywhere but only in accordance with the mathematical ratios, 2:1, 3:2, and 4:3, that determine the central musical concords of the octave, fifth and fourth. He evidently thought that the whole cosmos was composed of such continua delimited in accordance with number. Thus he argued that we come to know the world, just as we come to know a given musical scale, by grasping the numbers that determine it. Hence, in fragment B₄, he asserts that “all the things that are known have number. For it is not possible that anything whatsoever be understood or known without this.” There are some questions that can be raised about this metaphysical system,³² but my focus here is on Philolaus's cosmology, and so with this little bit of background, I will turn directly to it.

The clearest and most compact presentation of that cosmology is found in the doxographical tradition, which in all probability goes back to Aristotle's pupil Theophrastus. This passage has been contaminated with later Neopythagorean ideas, so I will quote here only the section that can confidently be regarded as authentic:

Philolaus says that there is fire in the middle [of the cosmos] around the center, which he calls the hearth of the whole and house of Zeus . . . and again another fire at the uppermost place, surrounding [the whole]. [He says] that the middle

32. See Huffman, *Philolaus of Croton*.

is first by nature, and around this ten divine bodies dance: the heavens, planets, after them the sun, under it the moon, under it the earth, under it the counter-earth, after all of which the fire which has the position of a hearth about the center. (Aetius II 7.7 = DK 44 A16)

The emphasis in this report is on what is most startling in Philolaus's system, namely, what is at the center of the cosmos. The earth has been moved from the center for the first time in Western thought and has become one of the ten heavenly bodies moving around it. The heaven of the fixed stars is the outermost body, followed by the five planets known at the time, the sun, the moon, the earth, and a mysterious counter-earth. Philolaus's mobile earth had direct influence on the emergence of Copernicus's heliocentric hypothesis, since Copernicus himself reports that he was led "to meditate on the mobility of the earth" by reading reports such as this concerning Philolaus's system (Preface to *On the Revolutions of the Heavenly Spheres*). Before rushing to hail Philolaus for taking a clear step forward in the scientific and rational explanation of the cosmos, however, it is important to emphasize that Philolaus's system is not heliocentric. The sun too is a planet, which, along with the earth, orbits around a central fire, which remains invisible to us.

Philolaus's cosmology has been read in radically divergent ways. Burkert argues that, in light of the invisible central fire and the similarly invisible counter-earth, Philolaus's system is "mythology in scientific clothing, rather than an effort, in accord with the scientific method, to save the phenomena."³³ He notes that a counter-earth, where everything is the reverse of our earth, is a feature common in folklore.³⁴ Another *testimonium* for Philolaus reports that he thought that the moon was inhabited by creatures fifteen times more powerful than we are, which produce no excrement (Aetius II 30.1 = DK 44A20). This was the last straw for Furley, who says in his important book, *The Greek Cosmologists*, that "the whole scheme lapses into fantasy" at this point. Furley concludes that "the system as a whole makes very little astronomical sense, and it is hard to believe it was intended to do so."³⁵ I do not have time to discuss the inhabitants of the moon here, but before taking discussion of them as a sure sign that

33. Burkert, *Lore and Science in Ancient Pythagoreanism*, 342.

34. *Ibid.*, 347–48.

35. Furley, *The Greek Cosmologists*, 58.

Philolaus was engaged in fantasy, it is important to remember that speculation on the inhabitants of the moon can be found in other thinkers of the fifth century, including such heroes of Ionian rationalism as Anaxagoras (DK 59A77).³⁶

In contrast to these modern scholars, Aristotle and his school clearly did take Philolaus's system as an attempt to explain the phenomena. Aristotle's pupil Eudemus, who wrote a history of astronomy, reports that, while Anaximander was the first to give an account of the sizes and distances of the planets, the Pythagoreans, by whom he is likely to mean Philolaus, were the first to assign the correct order to the planets (fragment 146 [Wehrli]).³⁷ This means that Eudemus regarded Philolaus as engaged in the same sort of enterprise as Anaximander (that is, rational rather than mythical cosmology) and as going beyond Anaximander insofar as he arranged the planets in correct order in accordance with their periods of revolution around the sun (that is, from the fixed stars inward: Saturn, Jupiter, Mars, Venus and Mercury). In order to arrive at this arrangement, Philolaus had to have access to records of observations of the movements of the planets, either from Greek observers or, more probably, from the Near East. No other Presocratic got the order of the planets correct. Democritus, for example, appears to have put Venus between the moon and the sun (see DK 68A86).

A similar division in scholarly opinion can be found regarding Philolaus's cosmogony. Although I do not have time to examine the issue in detail, two features of that cosmogony must be briefly noted, in order to understand the nature of Philolaus's cosmology. The fullest description of this cosmogony comes from a fragment of Aristotle:

The world is one, and time and breath were brought in from the unlimited as was the void, which distinguishes the place of each thing in each case. (Aristotle fragment 201 [Rose³])

The cosmogony starts from an initial unity, a one, and then three things are brought in from the unlimited: time, breath, and void. These are then said to be limited by the limit. This is clearly a cosmogony that makes good sense in terms of Philolaus's basic metaphysical principles, limiters and unlimiteds. The best place to seek guidance as to the nature of this

36. On the inhabitants of the moon, see Huffman, *Philolaus of Croton*, 270–76.

37. Wehrli, *Die Schule des Aristoteles*.

cosmogony is the actual fragments of his book. Fragment B7 evidently came close to the beginning of Philolaus's cosmogony:

The first thing fitted-together, the one in the center of the sphere, is called the hearth. (B7)

This seems very likely to be one of the texts on which Aristotle was drawing in presenting the account of Pythagorean cosmogony just discussed, since the cosmos is presented as beginning from a one. Since this one is presented as in the center and is called the hearth, it must be a reference to the central fire. This one is described as "fitted-together"; such language is always used elsewhere in Philolaus to refer to combinations of limiters and unlimiteds. The natural suggestion is, then, that the fire is the unlimited stuff that is limited by being placed in the center of the sphere and thus shows by its name that it is a combination of limiter and unlimited: central (the limiter) fire (the unlimited).

It is crucial to note that the cosmos seems to have had a structure before it had a stuff; that is, the limiter, the sphere, is presupposed, before the fire is introduced and combined with it in order to form the central fire. Why should Philolaus have assumed that the cosmos was a sphere? The most likely answer seems to me to be that he was influenced by Parmenides on this point. Parmenides famously argues that reality is similar to a sphere in its perfection: "Since there is a furthest limit, it is complete, from every side like to the body of a well rounded sphere, equally balanced from the middle in all directions" (DK 28B8.42-44). It is controversial whether he actually thought reality was a sphere or just similar to a sphere, but Philolaus seems to have accepted Parmenides's arguments as showing that the sphere was the most appropriate shape for what is. In fragment B17, Philolaus stresses just this uniformity of the sphere, arguing that the cosmos came to be from the center and came to be "upwards in the same way as downwards and the things above the middle are symmetrical with those below." If the cosmos is to be a sphere, it is natural to regard the center and periphery as its most important parts, since it is these parts that define any given sphere. Hence the emphasis on the central fire. But why put a fire in the center? Aristotle tells us that fire was regarded as the most valued element and that it was accordingly placed in the most important place, the center (*De Caelo* B.13.293a20). This argument does not provide a real answer to the question, for it is

reasonable to ask why fire is the most valued element. The *testimonia* for Philolaus's biology can provide an answer. According to Philolaus, the human embryo upon birth is composed solely of the hot, and this excessive heat then naturally leads the infant to draw in cooling air by taking its first breath (A27). The earth thus becomes a planet not because of any observations of the heavens that Philolaus carried out, but rather because of his observation of human birth and his decision to use the birth of a human being, the microcosm, as a model for the birth of the cosmos, the macrocosm.³⁸

Considerations of uniformity and completeness enter Philolaus's cosmos in one other striking way. Although Aristotle treats Philolaus's cosmology as if it were an attempt to explain the phenomena, he famously complains that the Pythagoreans twisted the phenomena to conform to their preconceptions (*Metaphysics* A.5,986a6-12). Thus, although the appearances indicate that there are only nine heavenly bodies (the sphere of the fixed stars, the five planets, the sun, the moon, and the newly mobile earth), the Pythagoreans add a tenth, the counter-earth, because ten and not nine was regarded as the perfect number. As noted above, some scholars think that the counter-earth must have had a different function and point to parallels for a counter-earth in folklore to suggest that the whole system is a mythic construction that has nothing to do with phenomena. Yet, Aristotle's explanation of the counter-earth is almost an exact parallel to the use of the sphere for the shape of the cosmos, in that it shows Philolaus willing to construct the world at least partially in terms of *a priori* conceptions of completeness and uniformity. Ten is the perfect number, as the sphere was the perfect shape. Philolaus's cosmogony consists of an interplay between continua such as fire, space, air, and time and the articulation of those continua by appeal both to observation and to *a priori* ideas of perfection. The crucial point is that these conceptions appear to have their origin in deductions such as those of Parmenides about the nature of reality and not in the beliefs about the gods or the beliefs about the fate of the soul, which structured Pythagoras's cosmos.

Turning back from cosmogony to cosmology, it can be shown that the cosmos resulting from this cosmogonic process is indeed answerable to the appearances in a way that Pythagoras's cosmos was not. Here

38. For a more detailed discussion see Huffman, "Philolaus and the Central Fire."

I want to borrow from Charles Kahn the distinction between a picture and a model.³⁹ Pythagoras's *acusmata* provide us with a picture of the cosmos that must have had a powerful emotional effect on his students, who could now see ideas about the fate of the soul built into the world around them. Nonetheless, a picture of this sort does not invite challenges from the phenomena. How could a Greek who was told that the sun and the moon are the Isles of the Blessed challenge this assertion in terms of the appearances? Moreover, I doubt that any of Pythagoras's listeners would have gone on to ask: but how do you explain eclipses or night and day? These are not the sorts of questions the cosmos of the *acusma* is designed to answer. It is instead intended to support a belief in a transmigrating soul. The cosmos of Philolaus is quite different. It is clear that Eudemus and Aristotle did think it appropriate to ask how Philolaus's cosmological system could explain certain basic astronomical phenomena. Even more importantly, Philolaus evidently responded to challenges of this sort, thus showing that Eudemus and Aristotle were not mistaken in regarding the system in this light.

There are three striking examples of challenges from the phenomena to which the Philolaic system responds. First, there are the basic phenomena of night and day. With a stationary central earth, night and day had been traditionally explained by the movement of the sun around a central earth. It is, then, natural to object to the Philolaic system that, if the sun does not move around the earth, there will be no way to explain night and day. Of course, it only makes sense to make this objection, and for Philolaus to respond to such an objection, if the system is indeed designed to explain the phenomena. Aristotle's report of the system in *De Caelo* (B.13.293a22–23) makes clear that the system addressed just this problem: “[T]he earth is one of the stars, and creates night and day as it travels in a circle about the center.” We know that night and day are caused by the rotation of the earth on its axis in a twenty-four hour period. The motion of the earth to which Philolaus appeals in explaining night and day is, as the report from the *De Caelo* above indicates, its motion in a circle around the center of the cosmos. Thus, the earth moves once around the central fire in a twenty-four hour period to produce night and day, while the sun is moving much slower, taking a year

39. Kahn, “Some Remarks on the Origins of Greek Science and Philosophy,” 3–4.

to complete the same circuit, so that it appears to move only a very little bit against the background of the stars in a twenty-four-hour period. At this point it is possible to see what it means to call Philolaus's system a model, since we can test it to see if it generates the desired effect. A first attempt would, in fact, end in failure. If the earth simply orbits around the central fire in twenty-four hours, the phenomena we know as night and day would not result. By consulting the model, it can be seen that, as it orbits, one side of the earth will always be turned to the sun and the other will always be turned away from it.

The model also raises another obvious problem for the system: why do we not see the central fire or counter-earth? Again, Philolaus's system does not ignore the objection but introduces a new feature to deal with these problems. We are told in fragment 204 of Aristotle that the counter-earth is not seen by us "because the body of the earth is always in our way" (Aristotle fragment 204 [Rose³]). The model shows that the only way for the body of the earth to be always in our way is for the earth to rotate on its axis so that our side of the earth is always turned away from the counter-earth and central fire. The earth's rotation on its axis once every twenty-four hours not only explains why we never see the central-fire and counter-earth, however; it also produces the desired phenomena of night and day, since the earth thus does turn away from the sun as it orbits the central fire.⁴⁰ Furley's assertion that "the system as a whole makes very little astronomical sense" and that "it is hard to believe it was intended to do so" is clearly mistaken.⁴¹ It does make very basic astronomical sense, and Aristotle's description of it makes very clear that it was intended to do so.

If Philolaus's system is designed in part to explain the phenomena, does this rule out its having moral significance in the way that the cosmos of the *acusmata* did? There is some evidence that Philolaus did not think so. In Aristotle's reports of Philolaus's system, he notes that the central fire was called the Garrison of Zeus (B.13.*De Caelo* 293b3).⁴² This

40. One *testimonium* (Simplicius *in de Caelo* 471.4 = DK 12A19) suggests that Philolaus may have had the path of the sun at an angle to that of the earth in order to explain why the length of the day varies with the season of the year.

41. Furley, *The Greek Cosmologists*, 58.

42. In his lost treatise on Pythagoreanism, Aristotle also reported the name of Tower of Zeus for it (fragment 204 Rose³), which also implies the idea of a citadel under guard.

looks very similar to what is found in the *acusmata*, that is, a part of the cosmos is identified with an item from mythology. The Garrison of Zeus as a name for the central fire makes sense in terms of the myth of Prometheus.⁴³ The fire in the center of the cosmos is identified with the fire Prometheus tried to steal and over which Zeus posted a garrison. In the *Protagoras*, Plato refers to the terrible guards of Zeus, whom Prometheus cannot get past (*Protagoras* 321d). This story of crime and punishment might be connected to the similar themes of punishment of good and bad souls that feature in the cosmological *acusmata*. Thus, Philolaus may be trying to have it both ways. He is providing a rational model of the cosmos, which is an attempt to save the phenomena, but he is also trying to build a moral dimension into the world as well.

In scholarship on Pythagoras it has been commonly supposed that those who deny that he was a scientist or mathematician do so because they cannot conceive of a scientific and a mythic outlook combined in one figure.⁴⁴ Many scholars would point out that the two outlooks are combined in Empedocles. In my view, Pythagoras is not a natural scientist or rational cosmologist of the Ionian sort, but this conclusion is not the result of the impossibility of conceiving of someone who put forth the *acusmata* also having a rational cosmology. We have just seen that Philolaus may have done so. The problem in the case of Pythagoras is not that the scientist cannot be combined with the religious expert, but rather that, while there is lots of evidence for the expert on religion, there is none for the scientist. Philolaus's system seems to have arisen from two sources. He adopted Pythagoras's moral and religious views and still allowed them some space in his cosmos. At the same time, however, he built a rational cosmology for which he could find no precedent in Pythagoras. Instead, it was a quite original development under the influence of Parmenides's account of reality as a sphere, on the one hand, and the Ionian tradition of explanation in terms of the opposites hot and cold, on the other hand. It is no wonder, then, that Aristotle was hesitant to describe the Philolaic cosmos as Pythagorean.

43. See further Huffman, "Philolaus and the Central Fire."

44. See Riedweg, *Pythagoras*, 73, and *HGP*, vol. I, 181.

5 ∞ A Systematic Xenophanes?

I. INTRODUCTION

To what degree was Xenophanes of Colophon a systematic thinker? That is, to what degree were the different aspects of his philosophy interconnected? In what follows I argue that Xenophanes achieved a unified understanding on three broad fronts—on the physical makeup of the cosmos, the nature of the divine, and the prospects for human knowledge—and that, in at least some respects, his findings in one area linked up with those in others. This seems to me a point worth making, partly because Xenophanes stands so early on in the Western philosophical tradition, barely two generations after the first philosopher-scientists of ancient Miletus,¹ and partly because he has not always been considered a significant thinker. Aristotle dismissed his views as “a little too naïve” to merit detailed discussion,² and in our own time Harold Cherniss described Xenophanes as “a poet and rhapsode who [became] a figure in the history of philosophy by mistake.”³ In any case, a volume devoted to the study of “the nature of the rationality represented by the advent of philosophy in the West” seems an appropriate venue in which to explore such a question.

I am grateful for criticisms and suggestions made by Patricia Curd, Patrick Miller, Derek Smith, and many of those present during the presentation of this paper at the Catholic University of America in September 2007.

1. Accepting 585 B.C. as the date for Thales’s prediction of a solar eclipse, assigning Xenophanes’s birth to the year 570 B.C., and assuming roughly twenty-five years per generation.

2. At *Metaphysics* A.5.986b27–28, Aristotle calls Xenophanes and Melissus *mikron agroikoteroi*—“a little naïve” or “rather naïve.” “Naïve” actually lies toward the nicer end of the spectrum of possible translations; LSJ also gives “countryman,” “rustic,” “boorish,” and “rude.”

3. Cherniss, “The Characteristics and Effects of Presocratic Philosophy,” 18.

Xenophanes was indeed “a poet and rhapsode”—a performer of Greek epic verse—who left his hometown of Colophon when the Medes invaded western Ionia (modern Turkey) in 546 B.C. By his own account, he spent most of his long life “tossing his thought around the Greek land” (see fragment B8), living for a period in Greek-speaking communities in Sicily and southern Italy, including Elea, where he may have met Parmenides.⁴ Thirteen of the approximately forty-five surviving fragments of Xenophanes’s poetry touch on the standard topics of Greek sympotic verse—on how to behave at a symposium (B1, B5, and B22), the true measures of personal excellence (B2 and B3), and the virtues and vices of various well-known individuals—Thales, Pythagoras, and the poet Simonides, among others (B6–8, B10, B19–21, and B45). In a group of seven fragments (B27–33), Xenophanes followed the lead of his Milesian predecessors in linking various natural phenomena with one or more basic physical substances and natural processes. In the well-known fragment B34, he appears to set limits on how much any mortal being can know, in the process drawing the fundamental distinction between knowledge and mere true opinion. In B18, however, he sounds a more optimistic note when he sets aside divine revelation in favor of a form of “seeking” that leads, in time, to the discovery of “something better.” In fragments B11 and B12, he rebukes Homer and Hesiod for their attributions of shameful conduct to the gods, and in B23–26, he sets out a contrasting account of “one greatest god not at all like mortals in either body or thought.” In two of his best-known remarks he appears to discredit all anthropomorphic conceptions of the divine:

Ethiopians <say their> gods <are> snub-nosed and black,
And Thracians <say theirs are> blue-eyed and red-haired. (B16)

If horses or oxen or lions had hands
Or could draw with their hands and accomplish such works as men,
Horses would draw the figures of the gods as similar to horses,
And the oxen similar to the oxen,
And they would make the bodies of the sort which each of them had. (B15)

4. English translations of the Greek texts are my own. I regard B14 and B23 as genuine expressions of Xenophanes’s views, inasmuch as the view of the divine they express appears to have left its mark on Greek thinkers as early as Aeschylus (cf. *Suppliants* 86–92 and 96–103) and Euripides (cf. *Heracles* 1340–47, *Iphigenia at Tauris* 387–91, *Philoctetes*, fr. 794, and *Hippolytus* 189–97).

On the basis of just these remarks, one would have to regard Xenophanes as an unusually independent-minded thinker—an outspoken critic of the leading poets of ancient Greece, a proto-epistemologist, and an active participant in the Ionian *Aufklärung* which marks the onset of scientific inquiry in the West. But what reason is there to think that Xenophanes's thinking was to a significant degree *systematic*?

In at least one respect, the prospects for a systematic Xenophanes seem unpromising; the inferential particles that as early as Parmenides serve as the hallmarks of logically organized prose are largely absent from the surviving Xenophanes fragments. The inferential particle *gar*—"for" or "because"—occurs just five times (at B2.13, B2.15, B27, B30.2, and B34.3), the inferential *epei*—"since" only once (in B10), and the inferential *oun*—"therefore," not at all.⁵ One connective that does appear frequently is *alla*—"but"—which reflects the fact that Xenophanes typically set himself in opposition to the views held by others. B14 provides a good example:

But (*alla*) mortals suppose that the gods are born,
Wear their own clothes, and have a voice and body. (B14)

—At least suggesting that the true story lies elsewhere. We should remember, however, that the portions of Xenophanes's poetry that have come down to us from antiquity are really just snippets—in most cases just a few hexameters, sometimes just a single word, that one or more later writers chose to quote.⁶ Early Greek writers, moreover, often adopted a paratactic style of presentation even when a subordinate relationship was intended. Anaxagoras, for example, will say of the cosmic Mind that it is "the finest and purest of all things and has every decision about everything and the greatest power and rules all things . . . and ruled the whole rotation . . . and Mind decided all things . . . and Mind set in order all things" (B12), when what he almost certainly means is that *since* Mind is the finest and purest of all things, it has the greatest power and *therefore*

5. *Oun* occurs once in the phrase *men oun* in B34.1, but Denniston cites this as an example of *oun* emphasizing a prospective *men*.

6. The briefest and most frustrating reports are the one-word quotations by later grammarians; e.g. the testimony of Pollux that "we find the word *kerason*—"cherry tree" in Xenophanes's *On Nature* (B39), or the report in the *Etymologicum Genuinum* that "the word *brotachos*—"frog" is also found in Xenophanes" (B40). None of the other surviving fragments shed any light on what Xenophanes might have thought about either frogs or cherry trees.

holds every decision, and since Mind holds every decision it *therefore* set all things in order. So the absence of the inferential particles that serve to structure later philosophical prose actually tells us very little about the character of Xenophanes's thinking.

A more telling consideration, I would argue, is that within each of three different areas of Xenophanes's thought—in (1) his accounts of the workings of the cosmos; (2) his views of the divine nature; and (3) his reflections on the sources and limits of human knowledge—the different elements link up with one another in readily identifiable ways.⁷

II. THE PHYSICAL MAKEUP OF THE COSMOS

In fragments 27 and 29, for example, Xenophanes identifies earth and water as the basic substance or substances from which all things come into being and into which all things perish. Similarly, the sea is said to be salty because of the many mixtures that are contained in it (A33), and the sea combines with earth within an ongoing cycle of destruction and re-creation of the dry lands (A32, 33). *Testimonium* A50 (from Macrobius) states that Xenophanes held that the soul consisted of earth and water, while B37 notes that “in certain caves water drips down”—perhaps a comment on the way in which water both emerges from and leads back to the formation of rocks. B30 identifies “great sea” as the source of all clouds, winds, rainwater, and rivers, and B32 in turn identifies “she whom they call Iris/rainbow” not as the messenger deity whose travels were reported by Homer and Hesiod, but as a certain kind of cloud:

She whom they call Iris this also is by nature a cloud,
Purple, red, and greenish-yellow to behold. (B32)

As we might expect in light of the characterization of the rainbow as “also . . . a cloud,” Xenophanes linked a number of other meteorological or celestial phenomena to the presence of clouds of one type or another. The Pseudo-Plutarchian *Miscellanies* credits him with holding that “the sun and stars come into being from clouds.” The massive doxography credited to Aëtius reports that “Xenophanes says that the stars come into

7. Here I disagree with the recent assessment by Edward Hussey: “Xenophanes’ universe, as revealed by his cosmology, hardly has much unity.” Hussey, “The Beginnings of Greek Science and Philosophy,” 13.

being from burning clouds" (A38), that "the sorts of fires that appear on ships, whom some also call the Dioscuri [the phenomenon we know today as St. Elmo's fire] are tiny clouds glimmering in virtue of the kind of motion they have" (A39), that "the moon is compressed cloud" (A43), that "all things of this sort [comets, shooting stars, meteors] are either groups or movements of clouds" (A44), and that "flashes of light come about through the shining of the clouds because of the movement" (A45). The upshot is a thoroughly earth-and-water way of thinking about natural phenomena and processes, with clouds playing the leading role in accounting for atmospheric as well as celestial phenomena. In retrospect it seems clear that Xenophanes's choice of clouds as the basic explanatory factor was an entirely natural one, partly because of their in-between, half-solid and half-liquid nature and partly because of their in-between, half-earthly and half-celestial location. It also happens to be the case that a number of the phenomena Xenophanes attempted to explain just look very much like clouds of one kind or another—whether shining, sparkling, colored, or compressed.⁸ One might hesitate to speak in terms of anything so grand as a "unified cloud theory," but the fact is that Xenophanes succeeded in linking clouds with a sizeable group of meteorological and celestial phenomena. In his recent study, Alexander Mourelatos concludes that Xenophanes's astrophysics "is internally coherent, that it can be attractively connected to intelligent observation of celestial and atmospheric phenomena, that it has significant connections with other parts of Xenophanes's philosophy, and that it does not at all have the vices of stultifying empiricism some modern scholars have found in it."⁹

III. THE DIVINE NATURE

When we turn to Xenophanes's comments on divine attributes and operations, we encounter a parallel situation—a set of striking individual remarks, with no logical connectives in evidence, yet with much that suggests a thoroughly integrated view:

8. As P. J. Bicknell pointed out, during the daytime the moon is often indistinguishable in color from that of the surrounding clouds; under these conditions the diagnosis of the moon as "compressed cloud" would have been plausible. See Bicknell, "A Note on Xenophanes' Astrophysics," 135–36.

9. Mourelatos, "The Cloud-Astrophysics of Xenophanes and Ionian Materialism," 137.

One god is greatest among gods and men,
 Not at all like mortals either in body or in thought. (B23)
 Whole he sees, whole he thinks, and whole he hears. (B24)
 But completely without toil he shakes all things by the thought
 of his mind (B25)
 Abiding always in the same place, he moves not at all,
 Nor is it seemly for him to travel to different places at
 different times. (B26)

Each of these famous “theological fragments” takes the form of a simple declarative sentence, with only a single connective particle, the strongly adversative *alla*—“but,” appearing in B25. However, as soon as we ask “why?” with respect to each of these assertions, a broad and coherent outlook begins to emerge. Why must there be just “one greatest god”? Why would such a god have to “see, think, and hear as a whole”? Why would such a god shake all things by the thought of his mind alone? And why would it be unseemly for him to move about from place to place?

One clue to the logical structure embedded in these remarks is provided by a reminiscence of Xenophanes’s teachings in Euripides’s *Heracles*:

But I do not think the gods desire to have illicit relations
 And I never believed nor will believe that chains are
 Fastened on their hands,
 Nor that one god is master over another.
 For god, if indeed truly he is a god, lacks nothing.
 Such ideas are the sorry tales of singers. (*Heracles*, 1341–46)

Two later restatements of Xenophanes’s teachings echo the same basic idea:

For it is inherent in the nature of the divine not to be mastered. (Pseudo-Aristotle, *On Melissus, Xenophanes, Gorgias*, 3.4 = A28)

He declares also that there is no one of the gods in single command over them, for it would be impious for any of the gods to be mastered; and not one of them is in any way in need of any of them. (Pseudo-Plutarch, *Miscellanies* 4)

Lying behind these three reports was almost certainly an original Xenophanean observation to the effect that “the divine is, of necessity, unmastered and lacking in nothing,” or to put the point in more positive terms: god, simply *qua* god, must be unlimited in power. The members of

Xenophanes's audiences would have been familiar with the idea of a god pre-eminent in both power¹⁰ and honor,¹¹ in the figure of Olympian Zeus, the father of gods and men.¹² But, as we are about to learn from B24–26, the powers possessed by Xenophanes's "greatest god" exceeded even those ascribed to the chief deity of Greek popular religion. According to Homer, all Olympus shakes whenever Zeus seats himself on his throne (*Iliad* VIII, 443) or nods his bushy brows in approval (*Iliad* I, 530); but Xenophanes's god "shakes all things" by the thought of his mind alone.¹³ In addition, the gods whom Homer and Hesiod depict have only a partial awareness of events taking place in the world below, and must frequently leave their Olympian heights to familiarize themselves with the local situation and set things straight. But "the whole" of Xenophanes's "one greatest god" sees, hears, and thinks; that is, he is both perceptive and conscious in all his parts, without employing any physical organs. He is, moreover, able to affect "all things" simply by means of the "thought of his mind" (*noou phreni*) and to do so without moving about from place to place, since that would be unseemly for him. Thus, while the members of Xenophanes's audience would have appreciated that Xenophanes's "one greatest god" was in some ways like the Zeus whom they revered, when they had given the matter some thought, they would soon realize that the god Xenophanes had described differed in important respects from the shaggy-haired deity who looked down upon the world from his Olympian home.

10. Cf. *hupermenès*, *Iliad* II, 350; *kratos esti megiston*, *Odyssey* V, 4; *hupermenei*, *Theogony* 534; *kratei te megistos*, *ibid.* 49, all said of Zeus.

11. Cf. *kudiste megiste*, *Iliad* II, 412; *kudiste Iliad* IV, 515; *Odyssey* III, 378; *kudiste megiste*, *Theogony* 548, said of Zeus and Athena.

12. Hussey, "The Beginnings of Greek Science and Philosophy," identifies a belief in divine perfection and completeness in every possible respect as the starting point for Xenophanes's theological reflections. However, these were not among Zeus's traditional attributes, nor could they generate all of the attributes Xenophanes wishes to ascribe to the divine ("unseemly for him to move about," for example, does not appear to be implied by either "complete" or "perfect").

13. The question of the relationship between Xenophanes's god and the cosmos is vastly more complicated than I indicate here. For an extended discussion of the matter see Palmer's "Xenophanes' Ouranian God in the Fourth Century," 1–34. Ann Mathie has pointed out to me that the conception of the "one greatest god" as related to the cosmos only by "shaking all things by the thought of his mind" sits uncomfortably with the assertion made in B38 that "if god had not made yellow honey, they would think that figs were far sweeter." So either God is more involved in the affairs of the cosmos than B25 suggests or else not every remark about "God" or "gods" should be taken as having theological implications.

In the same reforming spirit, and at about the same time, Heraclitus declares that “the one and only wise thing, is both willing and unwilling to be called by the name of Zeus” (B32), suggesting that the power that controls the entire cosmos is like Zeus in some respects but unlike him in others. And when it comes time for Anaxagoras to explain how the cosmos came to be in its present form, he too will follow Xenophanes in asserting the existence of a divine mind who, as Anaxagoras would have it, started the great mass of disorganized cosmic material rotating. Toward the end of the fifth century B.C., one of the characters in Aristophanes’s *Clouds*, who has enrolled in Socrates’s “Thought Shop” or “Thinkateria,” will sum up the teachings of the “new science” with the proclamation that “Zeus is out and Vortex is King.” But none of the early Greek philosophers would have expressed their views in such provocative language. Xenophanes and his Ionian cohort were seeking not to overthrow belief in the gods, but rather to correct popular misconceptions of the gods’ nature and roles. For Xenophanes, this would require, among other things, a different and more complex understanding of the meaning of the traditional epithet “greatest among gods and men.”

IV. THE PROSPECTS FOR HUMAN KNOWLEDGE

In the third major area of his thought, Xenophanes offers a series of remarks on the topics of human inquiry, opinion, and the prospects for knowledge. In what are the earliest recorded epistemological reflections in Western thought (B34) he states:

And no man has been nor will there be anyone who knows the sure truth
(*to saphes*)

About such things as I say about the gods and all things.¹⁴

For even if one succeeded better than others in speaking of what comes to pass, Still he himself would not know. But opinion (*dokos*) is fashioned for all. (B34)

These difficult lines have been variously interpreted ever since antiquity, but their core message, which is to say, Xenophanes’s distinctive brand of “skepticism,” is signaled by the appearance of the term *to saphes* in line one. In archaic Greek, *saphês* designated what is “surely known” to an individual insofar as he or she has been put in a good position to ob-

14. Alternatively: “About the gods and such things as I say about all things.”

serve it first-hand.¹⁵ In the generation following Xenophanes, Herodotus will also speak of direct experience as the key to achieving “clear or sure knowledge”:

Moreover, wishing to get clear knowledge (*saphes ti eidenai*) of this matter whence it was possible to do so I took ship to Tyre in Phoenice where I heard there was a very holy temple of Heracles. There I saw it (*eidon*), richly equipped with many other offerings. . . . At Tyre I saw (*eidon*) yet another temple of Heracles called the Thasian. Then I went to Thasos, too, where I found a temple of Heracles built by the Phoenicians . . . Therefore, what I have discovered by inquiry plainly shows (*ta men nun historêmena dêloi saphêôs*) that Heracles is an ancient god.¹⁶

Thus when Xenophanes denies in B34 that anyone has known or will ever know *to saphes*, we should understand him to be saying that no one has grasped, or ever will grasp, the sure truth (concerning the nature of such things as he discusses) on the basis of his or her own personal experience. The scope of the topic as described in B34.2—“what I say about the gods and all things”—immediately confirms this reading, inasmuch as nothing could be at a greater remove from the direct experience of mortal beings than the actions of the gods and the totality of events taking place throughout the cosmos. As Xenophanes elsewhere explains (B14–16), mortals fashion their understanding of the gods not as a consequence of direct experience of divine operations, but on the basis of their own generic human traits. The considerations mentioned in B34.3–4 reinforce this negative conclusion by pointing out that even if, in “the best case scenario,” one were to speak truly about events as they happen, that person would still lack knowledge, since no one’s experience of events as

15. Chantraine, *Dictionnaire étymologique de la langue grecque*, 991, cites the Hittite form *suppi*: “pure, clear” and holds that *saphês* and its cognates “exprime l’idée d’évidence, de clarté avec une vue objective.” The adjective form *saphês* does not appear in Homer, but the adverbial *sapha* occurs frequently in connection with knowing, with the meaning of “knowing well” or “knowing for sure,” typically on the basis of a direct and clear view of the relevant circumstances. For example, when Ajax comes out from among the ranks to challenge Hector to a duel he proclaims: “Hector, now indeed you will know *sapha* one on one/What kind of leaders there are among the Danaans” (*Iliad* VII, 226–27). It seems a reasonable conjecture that from the original meaning of “clear” or “directly evident” emerged the related meanings of “know for sure,” “know in detail,” and “know with precision or exactitude.”

16. Herodotus, *History* II, 44. Cf. also the use of *saphês* in the *Homeric Hymn to Hermes* (201–11) and in the scout’s report to Eteocles in Aeschylus’s *Seven against Thebes* (39–41 and 66–68).

they occur can justify a claim concerning the nature of things as they exist at all places and times. In B₃₄, then, Xenophanes appears to have (1) embraced the traditional view that, during their brief lifetimes, mortal beings witness only a small portion of a vast cosmos; (2) assumed the usual connection between having direct access to events and knowing *to saphes* about them; and (3) drawn the logical conclusion.¹⁷

Other Xenophanean remarks are entirely consistent with what the empiricist spirit expressed in B₃₄. A *testimonium* from Hippolytus (A₃₃), for example, gives us a picture of Xenophanes the scientific inquirer who draws on the discovery of fossilized remains of sea creatures at widely separated inland locations to support a theory of periodic worldwide flooding and drought:

. . . Xenophanes thinks that a mixture of the land with the sea comes about, but that in time (the land) becomes freed from the moisture. And he asserts that there are proofs for these ideas: that shells are found inland and in mountains, and he says that in quarries in Syracuse imprints of fish and seals were found; and in Paros the imprint of coral in the deep of the marble and on Malta slabs of rock containing all sorts of sea creatures.

Other fragments and *testimonia*—concerning Ethiopian and Thracian conceptions of the gods (B₁₆), Egyptian religious practices (A₁₃), the invention of coinage by the Lydians (B₄), mountains and volcanoes in Sicily (B_{21a} and A₄₈), and eclipses reported in different regions of the world (A_{41a})—fill out our picture of Xenophanes the Ionian scientific inquirer, a practitioner of what Plato would call *historia phuseôs* (*Phaedo* 96a) or “natural inquiry in the form of travel and direct observation, or the knowledge gained from such inquiry.” In the well-known fragment B₁₈, sometimes (though implausibly) read as an early expression of a faith in

17. This reading of B₃₄ is defended in Hussey, “The Beginnings of Epistemology,” 22–23, and in Lesher, *Xenophanes of Colophon-Fragments*, 166–69. It also bears some resemblance to the view defended in Heitsch “Das Wissen des Xenophanes,” 193–235, inasmuch as it sees the scope of Xenophanes’s claim as comprehensive rather than concerned only with perceptual knowledge (as had been proposed by Fränkel). However, Heitsch takes B₃₄ to be rooted in Xenophanes’s belief in the relativity or subjectivity of all human thought (as seen, for example, in his account of conceptions of the gods as rooted in human traits). By contrast, I do not believe that Xenophanes held that every human belief represented a merely subjective perspective; indeed, I believe that he intended for his accounts of the natural realm and of the divine to be accepted as objectively correct (cf. the admonition in B₃₅: “let these things be believed as like the realities”).

human progress, Xenophanes identifies “inquiry” or “seeking,” rather than divine revelation, as the source of human understanding:

Indeed not from the beginning did gods reveal all things to mortals,
But in time, as they seek, they discover something better. (B18)

On a more negative note, in B38 Xenophanes appears to be commenting on the extent to which human opinion is shaped by local conditions:

If god had not made yellow honey, they would think
That figs were much sweeter. (B38)

The remark is about figs and honey, but the implicit message might well have been much broader, to the effect that no perceptual judgment, perhaps no human judgment of any kind, can be wholly free of subjective bias. Xenophanes’s overall assessment of the prospects for human knowledge, then, seems decidedly mixed: as mortal beings undertake wide-ranging inquiries they will, in due course, “discover (a) better,” but no one will ever achieve sure knowledge, at least concerning matters that lie beyond our direct experience.

In each of three areas—the basic constituents of the physical universe, the nature of the divine, and the sources and limits of human knowledge—the individual elements of Xenophanes’s thought link up with one another in readily identifiable ways. It does not follow, however, that we can confidently credit Xenophanes with each and every one of these theoretical connections. There is, after all, the fallacy Richard Robinson once termed “misinterpretation by inference”—the mistake of thinking that insofar as some author S held that p, and p implies q, that S must have held that q.¹⁸ The truth of “Xenophanes believed that p, and p implies q” does not guarantee the truth of “Xenophanes believed that q.” At the same time, it is most unlikely that Xenophanes was wholly unaware of all the implications just identified. He was, after all, far more familiar with his own thoughts than we moderns will ever be. We also know that from time to time he reflected on how the views he expressed in one area related to assertions made in another. In B34.1–2, for example, he reflects on how far any mortal being can hope to know the sure truth concerning “such things as I say about the gods and all things,” which is to say, how far his epistemological conclusions have some bear-

18. Robinson, *Plato’s Earlier Dialectic*, 2.

ing on the outcome of his theological and scientific inquiries. At a minimum, he would also have realized that his explanation of “all things” in terms of earth and water put him in a good position to explain a wide range of phenomena (his use of the term *kai* [“also”] in the “this also is cloud” part of B32 reveals that the rainbow was only one of many meteorological phenomena being linked to clouds); that the various capacities attributed to the one greatest god were direct consequences of an attribution of supremacy in power; and that gaining information about events and states of affairs in different regions of the world was fully in keeping with the empiricist manifesto he had delivered in B34.

According to Xenophanes, then, the only things we mortals can know for sure are the events or states of affairs we happen to meet with over the course of our brief lifetimes; all else must remain a matter of opinion or conjecture. In addition, whatever degree of understanding we can achieve will come about only gradually (“in time”) and through our own labors (i.e., “by seeking” in the form of travel and direct observation), and it results in the discovery of only “something better.” The general impression we are given is that *human* knowledge, to the degree it comes at all, does so only gradually and after considerable expenditure of effort. Just the opposite, of course, holds true for the “one greatest god,” who as B23 put it, is “completely unlike mortals in either body or thought.”¹⁹ Unlike human beings, who are stuck with their bodily organs of sense and thought, “the whole (of it) sees, thinks, and hears”; and unlike human beings, who have to travel about to different corners of the globe in order to acquire their knowledge, the divine never “moves about from place to place.” In short, the ultimate reason why we mortals have to acquire our knowledge as we do, and why we know as little as we do, is that we are mortals and not gods. Xenophanes’s contemporary Alcmaeon had already explicitly drawn the contrast:

The gods possess knowledge of the sure truth (*saphêneia*) but [it is given] to men to conjecture from signs (*tekmairesthai*).²⁰ (DK 24B1)

19. The point has been made by Sarah Broadie: “The distinction between knowledge and mere belief, the human second best, bears out his description of the greatest god as not at all like us in body or in thought.” See Broadie, “Rational Theology,” 212.

20. The text in DK reads *peri tôn aphaneôn, peri tôn thnêton saphêneian men theoi echonti, hôs de anthrôpôis tekmairesthai*, but the initial phrases are often omitted. I follow LSJ and others in assuming *dedotai* (“it is given”).

Xenophanes's epistemology, in short, appears to have been driven largely by his theology.

Xenophanes's theology also appears to have had important implications for his way of understanding the nature of the cosmos. What he put forward, as we have seen, was a view of the physical cosmos in which a single pair of physical substances (earth and water, more specifically: clouds) and a small set of regular forces or principles (movement, evaporation, and compression) accounted for a wide range of phenomena. Many celestial objects and events long regarded as rich in religious significance—the sun, moon, comets, meteors, eclipses, lightning, thunder, the rainbow, St. Elmo's fire—are identified as clouds of different kinds, moving and being moved about in different ways. And again, in sharp contrast with all these, there is the divine who is “greatest among gods and men,” “unlike mortals in body,” wholly unmoving and unmoved, who is able to impart movement to the cosmos in its entirety by means of his thought alone. One might say (as I have said elsewhere) that “the demythologized naturalism of Xenophanes's scientific outlook neatly complements his denaturalized theology,”²¹ but there is a more basic point to be made: to a significant degree Xenophanes's cosmology, like his epistemology, *appears to have been driven by his theology*. Since the divine must be absolutely supreme in its power, then any merging or mingling of the divine with the physical would represent a diminution of its powers and a narrowing of its range of action that would be wholly out of keeping with its inherent nature.²² And a realization of the necessary non-physical character of the divine would have reinforced Xenophanes's view of the conditions that constrain human knowledge: the divine must be unlike mortals in both body and thought, having neither mortal voice nor clothing, and therefore “not from the outset” would truth have been revealed to mortals. Moreover, since the events taking place in nature are really only so many different rearrangements of earth and water, created and destroyed in accordance with a set of physical forces, we should not expect to find embedded in these physical phenomena any hidden indications of divine intentions and wishes. Both directly and indirectly,

21. Leshner, *Xenophanes*, 5.

22. Anaxagoras will state this point explicitly in his B12: Mind must be the purest of all things, since being mixed with any kind of material stuff would hinder and prevent it from controlling the cosmos as it now does.

then, we human beings are left to carry on as best we can with the resources the gods have put at our disposal. As he puts it in the final line of B34: *dokos d'epi pasi tetuktai*: “opinion has been fashioned for all.”

The surviving portions of Xenophanes’s poetry may reasonably be thought to have embodied an integrated understanding of the cosmos and the divine and a view of how far human beings can discover the sure truth concerning matters in either domain. It is not obvious, however, that every one of Xenophanes’s views, as expressed in the surviving fragments and reported in the ancient *testimonia*, can be placed within a surrounding matrix of related ideas.²³ In particular, it remains unclear how the various critical observations on the behavior of his fellow citizens related to his science, theology, and epistemology. His invitation to his fellow symposiasts to “hold always the gods in high regard” (B1) may reflect his belief in a god of maximal goodness (as well as power), but his assertion that “there is no use” in the poets’ stories of divine misconduct seems rather to reflect a social concern: tales of divine misconduct tend to legitimize and thereby encourage antisocial conduct among the folk. Similarly, his criticisms of the practice of showering victorious athletes with gifts and free dinners (see B2), his disparaging references to the gold-ornamented and perfume-drenched Colophonians (see B3), and his call for modest food and drink while celebrating models of civic virtue (see B22), all reflect a concern for the continued well-being of the city. It may be that in these verses we hear Xenophanes the moralizing poet and heir to the didactic tradition of Hesiod and Solon, rather than Xenophanes the philosopher and predecessor of Heraclitus, Parmenides, and all the rest of us.

23. Broadie, “Rational Theology,” 209, suggests that the successes Xenophanes and his Milesian predecessors had enjoyed in explaining natural phenomena may have led him to think that reason could also illuminate the separate topic of the gods. She also suggests that his conception of a single greatest god may have been inspired by the single physical *archê* [the basic substance] identified by the Milesian scientists. See *ibid.*, 212. It seems equally possible, however, that Xenophanes developed his theological proposals not as a result of his successful scientific theorizing but rather as a direct response to the crudities and absurdities in the stories about the gods told by Homer and Hesiod.

6 ∞ Parmenides, Early Greek Astronomy, and Modern Scientific Realism

SUMMARY

“Doxa,” the second part of Parmenides’s metaphysical and cosmological poem, is expressly disparaged by Parmenides himself as “off-track,” “deceptive,” and “lacking genuine credence.” Nonetheless, there is good evidence that “Doxa” included some astronomical breakthroughs. The study presented here dwells on fragments B10, B14, and B15 from the

This chapter incorporates, with revisions, material excerpted from my book, *The Route of Parmenides*, 2nd edition, revised and expanded (Las Vegas: Parmenides Publishing, 2008—hereafter *Route*), pp. xxxvii–xlviii, as well as from my article “Xenophanes’ Contribution to the Explanation of the Moon’s Light,” *Philosophia* (Athens) 32 (2002): 48 and 52–54. I acknowledge the kind permissions, respectively, by Parmenides Publishing and by the Academy of Athens, for use of the excerpted material. An earlier version of the entire essay has been published in *Parmenides Venerable and Awesome: Proceedings of the International Symposium*, ed. Néstor-Luis Cordero (Las Vegas, NV: Parmenides Publishing, 2011), 167–89. It is that version which is reprinted here, with further additions and changes, and again with the kind permission of Parmenides Publishing.

This essay originated as a lecture, presented October 19, 2007, at the Catholic University of America, and again, October 30, 2007, at the Coloquio Internacional, “Parménides, venerable y temible,” Universidad Nacional de San Martín, Buenos Aires. Other presentations in lecture form were as follows: December 2007, at the Università degli Studi di Napoli, Federico II; February 2008, at the University of Crete, Rethimno (for the latter, in my own Modern Greek translation); and April 2011 at the Universidad Complutense de Madrid, under auspices of the Sociedad Ibérica de Filosofía Griega (in translation by Beatriz Bossi). I thank the Catholic University of America and the other four sponsors respectively for hosting the lecture events, and I thank the audiences in all five venues for their helpful comments and questions. My special thanks to Beatriz Bossi, whose careful and elegant Spanish translation helped me detect points of unclarity or ambiguity in the English text. For thoughtful and challenging exchanges on earlier drafts, I thank Patricia Curd, German Sierra Roderó, and Thomas K. Seung.

“Doxa,” and especially on the term *aidēla*, interpreted as “causing disappearance,” in *Bio*.3. The aim is to bring out the full astronomical import of Parmenides’s realization of four related and conceptually fundamental facts: (i) that it is the sun’s reflected light on the moon that explains lunar phases; (ii) that it is the sun’s glare which, as the sun moves in its annual circuit, causes the gradual seasonal disappearance of stars and constellations, and that the absence of such glare explains their seasonal reappearance; (iii) that it is likewise the sun’s glare which causes the periodic disappearance, alternately, of the Morning Star and the Evening Star, and it is the absence of such glare that allows, alternately and respectively, for the reappearance of each of these stars; and (iv), a ready inference from (iii), the realization that the latter supposedly two stars are an identical luminary.

In seeking to make sense of the paradoxical antithesis of “Truth” versus a disparaged yet scientifically informed “Doxa,” the present study explores two modern analogues: Kant’s doctrine of the antithesis of “things-in-themselves” (or “noumena”) versus “appearances” (*Erscheinungen* or “phaenomena”); and the twentieth-century doctrine of scientific realism, notably propounded by Wilfrid Sellars. The latter model is judged as more apt and conceptually more fruitful in providing an analogue for the relation between “Truth” and “Doxa.”

ASTRONOMICAL KNOWLEDGE BEFORE PARMENIDES: THE MODERN ESTIMATES

By the middle of the last century, serious challenges had already been posed, and then continued being posed in subsequent decades, to older estimates by historians of science and historians of philosophy concerning the extent and depth of astronomical knowledge attained by Parmenides’s predecessors—i.e., by the Milesians, by Pythagoras, and by the early Pythagoreans. In the light of these challenges,¹ the older esti-

1. For Pythagoras and his schools, see Burkert, *Lore and Science in Early Pythagoreanism*; for the early Ionians, and more generally, see Dicks, *Early Greek Astronomy*, esp. chs. 1–4. The accounts both by Burkert and by Dicks have been criticized as hyper-skeptical in one or another respect. But the new standard—established in the second half of the twentieth century by these and other historians of early Greek science—a standard of cautious-critical canvassing of the sources for early Ionian philosophy and for Pythagoras and early Pythagoreanism, is no doubt salutary and has generally prevailed: cf. note 4 below.

mates of the contributions of pre-Parmenidean philosophers to astronomy now appear rather sanguine and exaggerated. Unfortunately, the exaggeration in these older estimates has had a lingering negative impact on the scholarship concerning the immediate successor to the Milesians, Xenophanes of Colophon, and likewise on the analysis of Parmenides's "Doxa." For if, as some scholars have argued, the sixth century B.C. natural philosophers had already achieved some major astronomical breakthroughs—such as articulating a spherical model of the universe, knowledge that the moon is illuminated by the sun, some inkling of the optical mechanism of solar eclipses, grasping the distinction between the celestial equator and the ecliptic—the ostensibly more primitive "cloud astrophysics" of Xenophanes was bound to appear to modern readers, at best, as a scientifically irrelevant exercise in philosophical satire, or, at worst, as absurdly retrograde.² Correspondingly, the higher the estimates were of Milesian and Pythagorean scientific accomplishments, the lower was the motivation to search Parmenides's "Doxa" for content of significance for the history of science. Moreover, given Parmenides's explicit disparagement of the content of the "Doxa" as "deceitful" (B8.52 *apatēlon*), it could readily be assumed that any scientifically fecund elements found in the "Doxa" represented doctrines that had already been established by Parmenides's predecessors.

By the standard, however, of today's more cautious assay of pre-Parmenidean science,³ both the cloud astrophysics of Xenophanes and the "Doxa" in Parmenides's poem ought to be viewed as constituting part of the record of early exploratory thrusts and gradual conceptual gains that ultimately led, in the second half of the fifth century, to the more sophisticated grasp of the fundamentals of astronomy attributed (among natural philosophers) to Anaxagoras and Philolaus, and (among astronomers) to Meton and Euctemon of Athens and to Oinopides of Chios.⁴ Accordingly, the "Doxa" may no longer be taken as merely polemical.

2. For an interpretatively more sympathetic account of the natural philosophy of Xenophanes, see my studies: "X Is Really Y: Ionian Origins of a Thought Pattern"; "La Terre et les étoiles dans la cosmologie de Xénophane"; "Xenophanes' Contribution to the Explanation of the Moon's Light"; and "The Cloud-Astrophysics of Xenophanes and Ionian Material Monism."

3. For a fine example of balanced approach (neither sanguine nor hyper-skeptical) to the accomplishments of earliest Greek science, see White, "Thales and the Stars." For another example, in this instance of wider compass, see Graham, *Explaining the Cosmos*.

4. See Dicks, *Early Greek Astronomy*, 55–59, 66–71, 87–89; Vlastos, *Plato's Universe*, 36–40.

Rather it now appears more likely that its astronomical tenets either represent scientific discoveries made by Parmenides himself or reflect his own engaged grappling with quite recent discoveries made by others.⁵ To be sure, Parmenides had fundamental philosophical reasons—which I discuss in the second half of this essay—that motivated his marking these tenets as “deceitful” and as not worthy of “genuine credence” (B1.30 *tais ouk eni pistis alēthēs*).⁶ But as I shall show in what follows, there is impressive inferential nexus in the astronomical tenets of “Doxa”; and this nexus is something Parmenides, philosophical enthusiast for strict logic that he was, must have found enthralling and even congenial.

THE CLUE IN *ERGA AIDĒLA*

When Parmenides has the goddess (who presents the scheme of the world of “Doxa”) announce at B10.3 that she will explain (cf. *hoppothēn exegeōnto*) the “works (*erga*) of the sun,” he puts in her mouth in that same line the rare and curious adjective *aidēlos*, *-on*. Pierre Chantraine, in his definitive etymological dictionary,⁷ lists, s. v., three senses, already found in Homer and also attested for later authors:

- a. “not to be countenanced” (“dout on ne peut supporter la vue”);
- b. the active sense, “causing disappearance, destructive” (“qui fait disparaître, qui détruit”), which is supported by the ancient commentators with glosses such as *aphanistikos*, *olethreutikos*, and which is the required sense (“le sens qui s’impose”) when the adjective qualifies *pyr*, “fire”;
- c. the passive sense, “what cannot be seen” (“secret, obscur”).

5. In the original edition of *Route* (New Haven: Yale University Press, 1970), chap. 9 (reprinted in Part I of the revised edition; also earlier in abridged form as “The Deceptive Words of Parmenides’ ‘Doxa’”), I emphasized the aspects of irony and ambiguity, both literary and philosophical, that allow “Doxa” to provide an important semantic commentary on potentially misleading terms used in “Truth.” (For example, the sense in which “what-is” is *pleon*, “full,” in “Truth” must not be equated with the sense of “full” in “everything is full of Light and Night” in “Doxa.” See *Route*, 261.) I still think that the play of ambiguity and irony is relevant and important; but, as noted in the “Preface and Afteward” of the revised edition (pp. xxxvii–xxxviii), it is of even greater importance not to underestimate the proto-scientific (especially astronomical) content in “Doxa.”

6. Unless a DK chapter number is shown, all references preceded by the letters A or B in this essay are to the corresponding sections of chapter 28 (Parmenides) in DK: “A” for testimonia; “B” for fragments of Parmenides’s poem.

7. Chantraine, *Dictionnaire étymologique de la langue grecque*.

In the Parmenides context, sense (a) may be contributing a subdued nuance. The sun's brilliant light is "not to be countenanced"; it blinds. Semantic-rhetorical-poetic play involving "foreground" and "background" meanings is precisely what we should expect in the "Doxa."⁸ For reasons that will be clear presently, I do not believe that the passive sense (c) plays any role in B10.3. But there can be little doubt, given both the general use of the adjective and the context in which it occurs in Parmenides, that sense (a) is the one in the foreground: "making unseen, i.e., causing disappearance," hence even "destructive, annihilating"—the sense well-attested in Homer when the adjective is paired with *pyr*, "fire," in the latter's function of "consuming" things. Certainly in Parmenides's use of the adjective at B10.3, the active sense is corroborated and reinforced by the term *erga*, "works."⁹ It would seem that the unusual adjective keys here on its subject as an *explanans*, not as an *explanandum*, as a cause, not as an effect. Let us look at the full context. For the moment, I leave the word at issue untranslated in its plural form *aidēla*:

You shall learn the *aidēla* works of the pure torch (*katharas lampados*) of the brilliantly shining sun (*euageos ēelioio*), and how they came about (*hoppothen exegenonto*). (B10.2–3)

Or, because *euageos* might be taken either as masculine, and thus attaching to "sun" (which is how it is construed in the translation just given), or as feminine, attaching to "the torch," the translation might be slightly different:

You shall learn the *aidēla* works of the pure, brilliantly shining torch (*euageos katharas lampados*) of the sun (*ēelioio*), etc. (B10.2–3)

The ambiguous syntax is unproblematic, and it may be viewed as another instance of that rhetorically charged ambiguity which characterizes this

8. See my *Route*, ch. 9. The latter chapter also appears, in condensed version, as "The Deceptive Words of Parmenides' 'Doxa'."

9. I judge it quite unlikely that the adjective can bear the sense of "always bright" or of "very bright" ("toujours clair," "bien clair"), as is proposed and argued for by Bollack, *Parménide: De l'État au Monde*, 264 and 266–67. Bollack leans on either of two rather remote possibilities: that *aidēlos* might stand for *aeidēlos* (*ai* for *aei*: as in *aidios*, "eternal"; or in *aizēos*, "robust"); or that it should somehow bear the sense of *arizēlos* or *aridēlos*, "clear, easy to recognize." Besides, there would be pointless redundancy in having "very bright" (*aidēla*, B10.3) just four words after "brilliantly shining" (*euageos*, B10.2).

part of the poem. Still, on either syntax, how does the sun's action result in "making things unseen"?

The noun "torch" firmly points us in the direction of Homer's *pyr aidēlon*, a fire that consumes and annihilates—notably "the torch of war," fire used as a weapon. Accordingly, it has been suggested, and I too entertained that possibility previously, that the reference is to the scorching, parching, withering action of the sun either in a catastrophic event (one thinks of the sun's running off-course in the Phaethon myth), or simply in the worst of a Mediterranean heat wave.¹⁰ But the adjectives "pure" and "brilliantly shining" would be incongruously mild in references to catastrophes. Indeed, before the advent of modern physics, observers and natural philosophers would hardly have viewed the scorching and parching involved in a heat wave as a process that is "secret, obscure." Rather, they would have seen it as a transparently obvious process: one in which both explanandum and explanans are manifest; not as one that calls for "explanations"—whereas it is precisely "explanations" (cf. *hoppothen exegenonto*) the goddess promises to deliver.

There is, however, a way in which the "torch of the sun," unlike ordinary fire, "renders things unseen" without physically burning them. And since the wider context in this same fragment is one of astronomy (the stars, the sun, the moon), it is unlikely that the explanandum (the effect) envisages catastrophic and extreme occurrences, whether experienced or mythical; it is more likely that it envisages events of celestial periodicity. The question asked shortly before can now be asked with greater precision. What is the action of the sun which is significantly tied to effects of celestial periodicity? The answer is obvious: it is the sun's "making unseen" in the course of blotting out, successively and periodically, other heavenly bodies by virtue of its glare.

There is a manifold of such *erga*. First, and most obviously, there is the diurnal disappearance of the stars. Immediately before Parmenides, Xenophanes had thought stars smolder by day and then flare up by night.¹¹ The "Doxa" offers the more sophisticated explanation: the disappearance is an illusion; the stars become invisible because of the sun's glare. Then, too, there is a corresponding effect of dimming that is sea-

10. See *Route*, 239.

11. See my essay "La Terre et les étoiles," esp. 346.

sonal rather than diurnal. From remote prehistoric times, humans had noticed that constellations and conspicuously bright single stars rise earlier and earlier, and set earlier and earlier, from week to week (indeed from one night to the next). This is the slow change in the appearance of the night sky that allows us to speak of the stars of winter, of spring, of summer, of fall. It is also the phenomenon that provides the oldest and most reliable method of marking the seasons and the passage of a full year: by noting the first appearances or disappearances of prominent stars or constellations—the method familiar to the ancient Greeks from Hesiod’s *Works and Days*. This slow westward advance of all the fixed stars (a motion different from that of their nightly passage from east to west) is, so the “Doxa” tells us, another illusion. It results from the annual progression of the sun in the *opposite* direction, eastwards, through the band of the zodiac. It is not that the stars constantly outpace the sun in their common diurnal course. No, it is rather the dazzling luminosity of the sun which, day-by-day, and season-by-season, “makes unseen, blots out, dims” successively new (longitudinal) bands of the sky as the sun drifts eastward in its annual circuit through the zodiac.

And there are more such *erg’ aidēla*, more dimmings by the sun’s overwhelming glare, that have explanatory implications in astronomy. The Evening Star’s eastward movement, away from the sun, makes that star periodically visible; its subsequent retrograde westward drift, toward the sun, eventually and once again renders it invisible. Correspondingly, it is the Morning Star’s movement ahead of the sun (westward, retrograde) which, at some stage, makes it visible, and subsequently it is the drift back toward the sun (eastward) that once again renders the Morning Star invisible. Quite obviously, these *aidēla erga*, “acts of dimming,” are inferentially connected with the realization—first attested for Parmenides—that the Evening Star and the Morning Star are the same celestial body (A40a).

Of course, there are also other bright stars in the sky that are lost in the sun’s glare and which, like the Morning Star and the Evening Star, fail to reappear with that unfailing regularity with which the fixed stars make their seasonal re-appearance. Could it not be the case that these seemingly irregular appearances and disappearances result from “acts of dimming” by the sun that affect numerically identical stars? Thus the breakthrough realization that Morning Star and Evening Star are

the same celestial luminary brought Parmenides to the threshold (and I leave it open as to whether he did or did not cross that threshold) of the further breakthrough realization that another four special stars, the ones eventually recognized by the ancient Greeks as “planets” (sun and moon being the first two of seven), were luminaries distinct from the fixed stars.

THE MOON AND ITS LIGHT

The sun’s glare—obviously for us, but not as obviously before Parmenides—affects the visibility of the moon. In this case, the dimming is very closely connected with the great discovery, for which the “Doxa” offers the first secure attestation, that the moon gets its light from the sun. In the Aëtius doxography we are told expressly that Parmenides held that the moon is illuminated by the sun (A42). The same is stated indirectly, in poetic yet fairly transparent terms, in fragments 14 and 15. Once again, it is worth dwelling on the details of wording. I take up the two texts in the sequence of fragment numbers:

νυκτὶ φάος περὶ γαῖαν ἀλώμενον ἀλλότριον φῶς

Daylight into the night (or “by night” or “for the night”), a light (alternate sense: “a fellow”) from somewhere else, wandering around the earth . . . (B14)

αἰεὶ παπταίνουσα πρὸς αὐγὰς ἡελίου.

Always, always gazing toward the shining beams of the sun . . . (B15)¹²

I have provided a double translation for *phōs* so as to convey Parmenides’s clever poetic play with ambiguity: ἀλλότριος φῶς, “a fellow from elsewhere, a stranger” (Homeric formula);¹³ and ἀλλότριον φῶς, “a light from elsewhere.”¹⁴ I have also retained—departing in this respect from all modern editions of the Parmenides fragments—the reading νυκτὶ φάος, which is the only reading that appears in the manuscripts.¹⁵ The

12. The doubling in the translation of *aiei* aims to capture a special metrical effect, concerning which see below.

13. Masculine noun *phōs*, with either grave or acute accent (φῶς or φῶς).

14. Neuter noun *phōs* with circumflex.

15. The context in the ancient source (Plutarch), as well as both philosophical and philological considerations, fully supports the reading of the manuscripts. See my study “The Light of Day by Night: *nukti phaos*, Said of the Moon in Parmenides B14,” in *Presocratics and Plato*:

venerable emendation (accepted over nearly half a millennium) *νυκτιφάεις* goes back to Joseph Scaliger in the Renaissance.¹⁶ But it is unnecessary and misguided. Parmenides is speaking of a property of the moon that applies to it *aiei*, “at all times,” not just with respect to those parts of the lunar cycle (late waxing gibbous, full moon, and early waning gibbous) during which it is *nyktiphaes*, “shining during the night.” The point that the moon is illuminated by the sun is made twice in B14: by speaking of its “light from elsewhere”; and by observing, most aptly, that the borrowed light of the moon—even at early waxing-crescent or late waning-crescent—brings *phaos*, “the light of day,” into the night.¹⁷

Moreover, there is significant astronomical knowledge implied in the choice of preposition in B14. Parmenides does not say *hyper gaian*, “above the earth,” but rather *peri gaian*, “around the earth.”¹⁸ This indicates that he has grasped that the moon’s diurnal course, and, by implication the sun’s diurnal course as well, are not arcs but complete loops, part of each loop lying above and part lying below the earth. There is also astronomical significance in his describing the moon as *alōmenon*, “wandering.” His choice of adjective points to his awareness of a distinct and important aspect in the variability of the “inconstant moon”: its points of moonrise and moonset on the horizon keep shifting, from one diurnal period to the next.

Another striking detail in B15 is the metrical effect of two spondees before the main caesura (—|—|—|—). Unmistakably, this puts heavy emphasis on the adverb of time *aiei*, “always,” the two-syllable word that occurs in the first foot of the hexameter line—which is why I have translated “always, always” above. Given this metrical reinforcement, *aiei* serves to encapsulate seven crucial facts about the orientation of the moon vis-à-vis the sun. I list these here, using italics to highlight the component of each observation that corresponds directly to the “always, always” of B15:

A Festschrift in Honor of Charles Kahn, ed. Richard Patterson, Vassilis Karasmanis, and Arnold Hermann (Las Vegas: Parmenides Publishing, 2012), 55–88.

16. See Cordero, “La Version de Joseph Scaliger du poème de Parménide.” I accepted (uncritically, as I now realize) that emendation in *Route*, even in the revised edition: see *Route*, 10, 224–25.

17. The repetition, far from being pleonastic, is thematically and poetically felicitous. See my study “‘The Light of Day by Night,’” 83–86.

18. In this sentence and in what follows in this section I incorporate remarks I have offered in “Xenophanes’ Contribution to the Explanation of the Moon’s Light,” 48 and 52–54.

- α. When, at first crescent, the moon reappears after its two to three days of monthly disappearance, it does so in the western sky, soon after sunset. In its relatively short time of visibility, the horns of the lunar meniscus point eastward, i.e., *the convex edge of the thin crescent faces the setting sun*.
- β. As the moon waxes into first quarter, it is seen progressively higher in the sky at dusk, and it shines progressively longer before moonset. But the *convex side* of the waxing meniscus *continues to be oriented in the direction of the sun*, toward the region of the horizon in which the sun has disappeared.
- γ. Later yet in the waxing phase, in the days before and after half-moon, the moon is now far enough from the sun and bright enough to be visible even before the sun has set. The non-waxing edge of the moon, opposite the direction in which the moon is growing, continues to be oriented toward the sun. The effect of *facing the sun is maintained*.
- δ. The full moon rises as the sun sets; the full moon sets as the sun rises. The disks of the two luminaries are *in direct opposition*, “*face-to-face*,” an impression that is heightened at moonrise by the familiar intuition (for observers at middle-northern latitudes) of a human face on the moon.
- ε. As the moon wanes, rising later and later in the night during the early days of third quarter, the effect of facing the sun is not as obvious after sunset and for most of the night. Toward the end of third quarter, however, by night, it is evident that the non-waning edge of the moon is now facing east, “longingly anticipating” (cf. *paptainousa*), as it were, the sun’s return to the sky at the end of night.¹⁹ In the absence of the sun, the “always” in B15 now assumes primarily extrapolative rather than observational character.

19. Karl Popper has very perceptively detected a hint of erotic sentiment in *paptainousa*, “gazing.” See Popper, *The World of Parmenides*, 68. In Greek, as in many other Indo-European languages (though not in Popper’s mother tongue, German), *Selēne* or *selēne*, “Moon-goddess/moon,” is feminine, and *Hēlios* or *hēlios*, “Sun god/sun,” is masculine. If I may elaborate on Popper’s astute observation by referring to the scheme of seven lunar phases distinguished in (α)–(η) here, the strongest “longing” occurs twice in the course of the synodic month: first, as the moon is being pulled away from her “lover,” after astronomical conjunction (new moon) in the first quarter (α) and (β); and then again as reunion with her lover (astronomical conjunction) is increasingly anticipated in late third quarter and in fourth quarter (ε) to (ζ). For other insightful aspects of Popper’s highly original discussion of Parmenides B14 and B15, see below.

ζ. After sunrise, during the third quarter, the moon is still visible in the sky; and for the rest of the day till moonset the luminous part is *again on that side of the lunar disk which faces the sun*.

η. In the last days of fourth quarter, the waning meniscus rises toward the end of the night or at dawn, just ahead of the sun. In its progressively diminishing time of visibility, before the risen sun's glare blots out the moon, the horns of the meniscus point away from the sun, i.e., the convex edge of the thin crescent is *oriented toward* the region of the horizon *where the sun has just risen or will be rising*.

A modern manual for navigators and outdoorsmen records the same facts, with none of Parmenides's poetic conceits, through prosaic repetition of the word "always":

New crescent moon (waxing) *always* close behind the sun. . . . When full moon is rising the sun is *always* setting. . . . When the full moon is setting the sun is *always* rising.²⁰

Of special interest is the contrast between (ε) and what is recorded for the other six phases. As noted above, (ε) constitutes an extrapolation, based on the observations made in (α)–(δ) and in (ζ)–(η): through the dark part of the night, well after sunset and long before dawn, the moon is still "gazing" at the sun.

Anyone who has realized that these six observations and the one extrapolation admit of no exception has either grasped, or is on the way to grasping, the fact that the moon gets its light from the sun. The "always" of B₁₅ thus has double astronomical significance. It collects suggestive observations that ultimately led to the correct explanation of the moon's light. But it also makes the inferential leap to two theoretically powerful generalizations: the moon is directly opposite the sun not only at moonrise/sunset at full moon but also when the moon is high in the sky at night at or near (before or after) full moon; the sun must, therefore, at least at those same times, be passing directly *under* the earth.

The connection between the doctrine of B₁₄ and B₁₅ and the reference to *erg' aidēla* in B₁₀ is now clear. Just as the sun makes the moon visible by casting its light on it, that very same *ergon* makes it impossible—certainly for ancient observers—to see the moon under the fol-

20. Gatty, *Nature Is Your Guide*, 218. I have added the italics.

lowing conditions (and for modern observers, who can avail themselves of binoculars and telescopes, we would have to say not “impossible” but extremely difficult with the naked eye):

1. One or two days either before or after new moon.
2. When the sun is still high in the sky before dusk, in the early days of first quarter.
3. At moonrise during the first quarter.
4. At moonrise for about the first half of the gibbous phase before full moon.²¹
5. After sunrise in the late days of fourth quarter.
6. At moonset in the fourth quarter.

Xenophanes had departed only slightly from the naïve pre-scientific belief that from time to time the moon dies and is subsequently reborn. Indeed, he appears to have exploited both the aspects of variability of the “inconstant moon” and the six circumstances, noted immediately above, under which the moon is absent from the sky, to argue that there is no single moon but a plurality, successively, of “moons.” Each “token” of the moon-“type” is a special cloud-formation, one that either congeals out of vapors into visibility or is dissipated and thus lost from view. By contrast, Parmenides’s “Doxa” connects facts about the moon’s non-visibility (observations cited here under [1]–[6], above) with that very trenchant observation recorded in B15: “[The moon] always gazing at the bright beams of the sun.”

THE FULL ASTRONOMICAL IMPORT OF B14 AND B15

Karl Popper²² and Daniel W. Graham²³ have rightly hailed the tremendous conceptual import of Parmenides’s realization that the moon gets

21. On a clear day, in the earlier days of second quarter, a sharp-eyed and systematic observer may be able to spot moonrise in early afternoon. But even on a cloudless day, the combination of strong sunlight and the inevitable haze low in the eastern horizon makes this observation difficult and unlikely. Before the last days of second quarter, for a “naked-eye” observer, the moon first comes into view—or, as Xenophanes theorized, is constituted out of vapor—somewhere above the eastern horizon.

22. Popper, *World of Parmenides*, 68–145 passim, esp. 68–70, 80, 84–85.

23. Graham, *Explaining the Cosmos*, 180–81; cf. also his “La Lumière de la lune dans la pensée grecque archaïque,” 366–70.

its light from the sun. For, as both of these scholars have shown, the discovery not only leads logically to the twin inferences I have already mentioned (viz., the passage of both moon and sun under the earth) but also ushers in an entire cluster of six logically interwoven and mutually supportive inferences:

- i. the moon has spherical shape;
- ii. the moon is a solid, inherently dark (opaque) body;
- iii. the moon passes under the earth;
- iv. the sun passes under the earth;
- v. the orbits of both luminaries are not arcs (let alone straight lines, as Xenophanes had thought) but complete circles;
- vi. the orbit of the sun is higher than that of the moon.

And this theoretically powerful cluster of inferences invites and encourages two further hypotheses and extrapolations:

- vii. the earth too is a sphere;
- viii. the universe is spherical.

For there is credible evidence in the testimonia that the latter two doctrines, (vii) and (viii), were also introduced or represented in “Doxa.”²⁴ What is more, once (i)–(vi) are connected with the observation that the moon’s path across the heavens stays close to that of the sun’s annual eastward drift (the ecliptic), the correct explanation of solar and lunar eclipses is nearly inevitable. (We have no testimony, however, that the correct explanation of eclipses was offered by Parmenides; that honor, according to our sources, goes to Anaxagoras.)²⁵

This complex of astronomical doctrines is no potpourri of views held by predecessors; the doctrines constitute a well-woven inferential fabric. Even more remarkably—this time with credit to Popper alone for having noticed and exploited this feature of “Doxa”²⁶—the two constitutive forms, Light and Night, are the warp and woof that run through that inferential fabric. The whole world of “Doxa” is indeed one of play of Light and Night. On the side of Night, we have solid, opaque, inherently invis-

24. See Diogenes Laërtius IX.21–22 (= DK28A1). Cf. Kahn, *Anaximander and the Origins of Greek Cosmology*, 115–16; Graham, *Explaining the Cosmos*, 181–82.

25. Anaxagoras DK 59A42. Cf. Graham, *Explaining the Cosmos*, 221.

26. See above note 19.

ible bodies. Light that is cast upon them makes such bodies extrinsically visible, as light is reflected. And yet, paradoxically, Light also produces effects of extrinsic invisibility, in two ways. First, it casts shadows when it is blocked by opaque bodies, the congeners of Night, thus restoring other such opaque bodies to their intrinsic invisibility. And, second, even on the side of pure, unmixed (cf. *katharon*) Light, the glaring strongest light (that of the sun) blots out lesser lights, thus rendering them invisible.

THE RELATION OF “DOXA” TO “TRUTH”:

HOW RELEVANT IS KANT?

Given the explanatory potential of the observational astronomy in “Doxa,” the topic of the relation between the two parts of Parmenides’s poem needs to be re-examined, specifically from the angle of scientific content. Nothing that I have said in what precedes and nothing that will be said in what follows should be taken as mitigating the very sharp contrast Parmenides posits between “Doxa” and “Truth.” In the latter, he deduces a set of at least four “constraints” on the *eon*, “being, what-is, the real”—otherwise put, four criteria that *eon*, the subject at issue, must meet, or four formal or defining attributes it must bear: (a) “unborn and imperishable”; (b) “indivisible,” “all-of-it-together-one” (*homou pan/hen*), “continuous” or “cohesive” (*syneches*); (c) “motionless” or “unchanging,” or (what is more likely) “immovable, unchangeable”; (d) “fully actualized, perfect.” Some readings of Parmenides would add one or more of three additional constraints or specifications: (e) non-temporal, outside time; (f) unique, solitary; (g) spherical. And yet, in spite of the famous or notorious attempts by his pluralist successors in cosmology to reconcile the world-image that is prompted by the familiar, ordinary intuitions that draw on the testimony of the senses, it is evident that no entities of that familiar world-image could possibly meet even the first four of the constraints. The contrast between “Truth” and “Doxa” is stark; the logical gulf that separates them insuperable.

In speaking of a “world-image prompted by familiar intuitions,” I am deliberately avoiding the language of “appearances.” It is of paramount importance to note that the “Doxa” is not intended as a phenomenology of the “given,” as a purely descriptive account of appearances.²⁷ And even though

27. I stress this point in ch. 8 of *Route*. Others have made the same point: most recently Néstor-Luis Cordero in *By Being, It Is*, 33 and 152–54.

“Light” and “Night,” the primary constituents in “Doxa,” are referred to as *morphai*, “forms, (visual) aspects,” Parmenides nowhere says or suggests that he intends these as *morphai tou eontos*, “(perceptible) forms of what-is/of the real.” Most strikingly, he does not speak of *phainomena* but rather of *dokounta* (B1.31). The latter term has a deep logical connection with the verb-phrase *dokei moi*, “it is acceptable/appeals to me,” hence “it seems to me,” and also with that phrase’s etymological ancestor, the verb *dechomai* or *dekomai*, “I accept.” The *dokounta*, accordingly, must be things that are “taken (to be thus and so),” or things “deemed *acceptable*,” or “approved,” or “assumed”—not things simply “given” to our senses.

Indeed, the *dokounta* of Parmenides have something of the conceptual richness of Kant’s “*phaenomena*” (note the Latinizing transliteration, with “-ae,” used by Kant) or *Erscheinungen*. There is some danger that the general use of the English term “phenomena” may here prove misleading. For we find the term “phenomena” used both in translations of the Greek term *phainomena* (in the standard modern transliteration with alpha iota), for contexts in which that Greek term could bear a purely phenomenological or phenomenalistic sense, but also in translation of Kantian “*Phaenomena*”/*Erscheinungen*. The latter is a theory-laden term, thus properly corresponding in Greek to *dokounta*, “things deemed to be so.”²⁸ To avoid confusion I shall henceforth use the spelling “phenomena” (without capitalization, and with quotation marks omitted) when I refer to Kant.

Comparisons between Parmenides and Kant have at various times been introduced in discussions of Parmenides—though by some scholars only so that any such comparison may be ruled out or discouraged as “anachronistic.”²⁹ In the second half of the twentieth century, the relevance and suggestiveness of the Parmenides-Kant comparison was strongly promoted by Karl Popper, in connection with his appreciative reading of the scientific content of the “Doxa.”³⁰ The comparison is in several respects quite apt:

28. And, of course, as students of Kant know well, the ordinary use of *Erscheinungen* in German shows the same ambiguity that is found in the general use in English of “phenomena” (as distinct from Kant’s quite technical use of “Phaenomena”).

29. Burnet, *EGP*, 182–83.

30. Popper, *World of Parmenides*, 143–44: “Burnet once said . . . that we must not (as Theodor Gomperz did) interpret Parmenides as a Kant before Kant: . . . But this is exactly what we must do.” Cf. 81–82, 98–99, 128n26, 134n76.

- a. In Kant we have a sharp contrast between the realm of “noumena” or “things-in-themselves” and the world of phaenomena (*Erscheinungen*). In Parmenides we have a similarly sharp contrast between the realm of “what-is” or “the real” and the world of “Doxa.”
- b. The world of phaenomena in Kant is conceptually structured: it constitutes a system; and it affords the possibility of empirically based science. Similar comments apply to the *diakosmos*, “world order,” of the “Doxa.”
- c. Failure to distinguish properly between noumena and phaenomena gives rise, according to Kant, to contradictions, “paralogisms,” “antinomies.” There is more than a little resemblance here with the predicament of Parmenidean “two-headed (*dikranoi*) mortals” who wander on a *palintropos keleuthos*, “a route that turns back on itself” (B6.5, 6.9).
- d. The Kantian realm of phaenomena is constituted by forms, structures, and categories that are projected by human sensibility and human understanding. An act of human projection is likewise the source and origin of “Doxa”: B8.53 “They resolved (*gnōmas* . . . *katethento*) to name two forms.”

But there are also some major disanalogies. For Kant, noumena are altogether unknowable and beyond understanding, whereas for Parmenides “what-is” is pre-eminently the object of knowledge and understanding. Moreover, nothing that applies to the realm of noumena could serve to explain or make intelligible the structures or features that characterize the world of Kantian phaenomena. Parmenides, by contrast, does invite—albeit programmatically—a transfer of properties from “what-is,” his counterpart of Kantian noumena, to *dokounta*, his counterpart of Kantian phaenomena, the very move that is prohibited by Kant. The deductions of B8 are specifically intended to serve as criteria of reality, as constraints on any project of cosmological inquiry.³¹ So understood, these constraints do function rather like Kantian “categories,” which for Kant apply not to noumena but exclusively to the world of phaenomena. In Parmenides, again by contrast, the criteria and constraints apply in the first instance and primarily to the counterpart of Kantian noumena,

31. This is not a universally accepted interpretation of Parmenides; but it is one that I have supported in other studies. See esp. *Route*, 134–35; also references in next note.

to the “what-is”; but they also apply programmatically, or jussively to the *dokounta*. This is what I take to be the import of B1.31–32:

... how it would have been right [*chrēn* counterfactual, as most commonly in the imperfect of this modal verb] for *dokounta* to be *dokimōs* [by the best of tests and criteria] if only they just had being in every way [I read *per onta*, not *perōnta*, and I construe the participle as hypothetical].³²

It is also of paramount importance that in Kant there is no “rivalry” between phaenomena and noumena. Even though Kant speaks of the latter as “transcendent” (i.e., transcending human sensibility and cognition), he envisages no evolutionary, historical, epistemological, or idealized circumstances in which noumena may come to “replace” phaenomena. The rhetoric of Parmenides’s goddess, by contrast, presents the realm of “what-is” certainly as superior to, and indeed as overthrowing—ontologically and epistemologically—the world of “Doxa.”

A BETTER MODERN ANALOGUE

If the comparison with Kant fails in these respects, there is at least one other modern philosophical model that lends itself for comparison with Parmenides; and in this case, I find the comparison even closer and more successful. I have in mind a system from the latter half of the twentieth century, one significantly inspired by Kant: the “scientific realism” of Wilfrid Sellars.³³ Corresponding to Kant’s contrast between noumena and phaenomena, and to Parmenides’s contrast between “Truth” and “Doxa,” we have in Sellars the contrast between the “Scientific Image” and the “Manifest Image.”³⁴ The Scientific Image presents the world as the latter is revealed and exhibited by the latest (twentieth-century and forward) and best-defended scientific theories. Saliently characteristic of

32. *Route*, 203–18. Cf. my comment on B1.31–32 in my review of Patricia Curd’s *Legacy of Parmenides* in “Parmenides and the Pluralists,” 125.

33. For introductory or general accounts of the philosophy of Wilfrid Sellars, see Willem A. de Vries, *Wilfrid Sellars* (Chesham, Bucks: Acumen, 2005); James R. O’Shea, *Wilfrid Sellars* (Cambridge: Polity Press, 2007); Johanna Seibt, *Wilfrid Sellars* (Paderborn: Mentis, 2007—in German). On the Web: Willem deVries, “Wilfrid Sellars,” *The Stanford Encyclopedia of Philosophy* (Fall 2011 Edition), Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/fall2011/entries/sellars/>.

34. Sellars, *Science, Perception and Reality* (hereafter *SPR*), ch. 1, passim.

the Scientific Image is that it “postulates *imperceptible* [my emphasis] objects and events for the purpose of explaining correlations among perceptibles,” and may therefore also be referred to as the “postulational” or “theoretical” image.³⁵ The Manifest Image, the foil to the Scientific Image in Sellars’s system, is no primitive worldview; nor is it a phenomenalist scheme of sense-contents that are immediately “given”—Sellars famously attacked the “Myth of the Given.”³⁶ Prominent categories in the Manifest Image are “persons, animals, lower forms of life and ‘merely material things’ like rivers and stones.” The “original” and fundamental category in the Manifest Image is that of persons; and “impersonal things and impersonal processes” are conceptualized as persons “in a pruned or truncated form.”³⁷ Moreover, most of what Sellars refers to as “merely material things” (what, in his lectures that I heard as student, he spoke of as the “stuffing” components of reality, in contrast to structuring principles or to structured or configured objects) present themselves within the Manifest Image as “ultimately homogeneous.” By way of example, “[t]he manifest [pink] ice cube,” Sellars writes, “presents itself as something which is pink through and through, as a pink continuum, all the regions of which, however small, are pink.” Indeed, he generalizes, “colour expanses in the manifest world consist of regions which are themselves colour expanses, and these consist in their turn of regions which are colour expanses, and so on.”³⁸ This is in stark contrast to the theoretical objects postulated by the Scientific Image, for which the governing principle is one of non-homogeneity: the parts or regions of a theoretical object T are not themselves Ts (e.g., atoms are not made of atoms, electrons are not made of electrons, genes are not made of genes).

With strong emphasis and with much repetition, Sellars proclaims that there is an inevitable “clash” between the two images. (And the words or phrases I quote from Sellars, in this paragraph and all others

35. *SPR*, 19, 7.

36. *SPR*, chs. 3 and 5.

37. *SPR*, 9, 13. “Original” envisages quite strictly the anthropological origins of the Manifest Image. The latter, Sellars emphasizes, while it incorporates elements of the “original” image, is progressively refined and develops a scientific (even though not properly “postulational”) component. See further on this below.

38. *SPR*, 26 and 35. In place of “ultimately homogeneous,” in characterizing this pervasive feature of the Manifest Image, many philosophers today would prefer the more precise Aristotelian term “homoeomerous.”

that follow, are the ones that bear the stress in their original context, even when Sellars does not mark them with italics.) Sellars states specifically that the Scientific Image is a “rival” to the Manifest Image; that the Scientific Image is “superior” to the Manifest Image and has “primacy” over it; that only the Scientific Image affords a “complete” explanation; that the Scientific Image gradually “replaces” the Manifest Image; that ultimately, and in principle (i.e., except for practical purposes and with respect to all contexts in which norms and values are at play), the Scientific Image is destined to replace the Manifest Image, so that the latter (again in principle) totally “disappears”; and that the Manifest Image may properly be judged as “false” or “unreal.”³⁹ Even more remarkably, apropos the comparison I am drawing here with Parmenides,⁴⁰ Sellars makes statements such as the following:

On the view I propose, the assertion that the micro-entities of physical theory really exist goes hand in hand with the assertion that *the macro-entities of the perceptible world do not really exist*. . . .

[T]he objects of the observational framework *do not really exist*—*there really are no such things*.⁴¹

Kant, then, was right, according to Sellars, to this extent: beyond the world of phenomena, transcending it, is the ultimate reality of the noumena. The latter, for Kant, famously comprises also the realm of autonomous moral agents. But setting aside considerations of ethical conduct and normativity (which in Sellars’s system are handled separately), Sellars insists that what Kant would consider non-autonomous noumena are not “unknowable things in themselves, but simply the world as constructed by scientific theory,”⁴² a world comprising “scientific objects about which, barring catastrophe, we shall know more and more as the years go by.”⁴³

I find the analogy between “Doxa” and the Manifest Image quite

39. *SPR*, 14, 20, 25, 27, 29, 32, 38.

40. Without referring to Sellars, Cordero comes at one point remarkably close to this Sellars-inspired conception of the relation between “Truth” and “Doxa.” Bringing forward the example of water, Cordero remarks: “only the scientist grasps its inner structure, its *logos* . . . and expresses it in a formula: H_2O A lay, nonscientific viewpoint believes that water is ‘just’ a liquid, colorless, tasteless, and odorless element” (*By Being, It Is*, 155).

41. *SPR*, 96, 126. Italics in the original.

42. *SPR*, 97.

43. Sellars, *Science and Metaphysics: Variations on Kantian Themes*, 173.

striking. Persons or “truncated persons” populate the world of “Doxa”; and the “merely material things” (to borrow the phrase used by Sellars) that are the prime constituents of the world of “Doxa,” Light and Night, are marked by that property of “ultimate homogeneity” which signals the clash between the Scientific Image and the Manifest Image in Sellars. And here is another significant point of the comparison. At the start of her expounding of the “Doxa,” Parmenides’s goddess states that she will “disclose/declare (*phatizō*) this whole truth-like framework (*diakosmon eoikota*), so that no mortal may surpass you (*parelassēi*) in knowledge (or ‘through knowledge,’ or ‘in judgment/discernment,’ *gnōmēi*)” (B8.60–61).⁴⁴ The implication, as many students of Parmenides have rightly noted, is that there are better and worse ways of articulating the framework of “Doxa,” and that what the goddess offers is (presumably) the best. Sellars correspondingly observes that “there is a correct and incorrect way to describe this objective image which we have of the world in which we live, and it is possible to evaluate the correctness or incorrectness of such a description.” He also observes that “much of academic philosophy can be interpreted as an attempt by individual thinkers to delineate the manifest image.”⁴⁵ Finally, and most importantly, he stresses that the Manifest Image is, like the Scientific Image, an “idealization,” and that “the conceptual framework [of] the manifest image is, in an appropriate sense, itself a scientific image.” For “[i]t is not only disciplined and critical; it also makes use of . . . aspects of scientific method,” notably “correlational induction.”⁴⁶ The crucial difference, of course, is that the Scientific Image is “postulational”: the entities it introduces (like the entity or entities introduced by Parmenides in “Truth”) have wholly and purely theoretical character and status.

Anachronism has a bad name in the history of philosophy, because its practice often serves the purpose of making extravagant and gratu-

44. I am adopting the simple emendation *gnōmēi* (correcting in this respect what is said in *Route*, 13 and n15, and 226n15). As many have observed, Parmenides here uses the language of chariot racing. The act of *parelaunein*, as though of “one racer passing another,” needs to be envisaged as taking place between “you” (the *kouros* being addressed) and any other single mortal; not between “you” and an abstract entity, a *gnōmē*.

45. *SPR*, 14. Sellars also notes that “the so-called ‘analytic’ tradition . . . under the influence of the later Wittgenstein, has done increasing justice to the manifest image, . . . isolating it in something like its pure form” (15). He adds that this exhibits continuity with the tradition of “perennial philosophy” (scil., Aristotelianism, Thomism, common-sense realism).

46. *SPR*, 14, 15, 19, 7.

itous claims of anticipation of modern theories by ancient ones. But in the present instance, the comparison between Parmenides and either Kant or Sellars has a more modest heuristic purpose and function: to explore conceptual structure by modeling an ancient theory on a modern one. I believe that there is more of potential gain and benefit than of loss and harm in this sort of comparative analysis. The disparaging, even condemnatory, language Parmenides's goddess uses in reference to the "Doxa" comes across as incomprehensibly paradoxical. How, we may ask, could the same philosopher who gave us "Truth" expound in detail and with earnest engagement the cosmology of "Doxa"? After branding "Doxa" as shaped by opinions "in which there is no true/genuine trust/credence" (B1.30 *pistis alēthēs*), after warning that "Doxa" is formulated in "a deceptive scheme of words" (B8.52 *kosmon . . . epeōn apatēlon*), how could Parmenides make "Doxa" the vehicle either of his own scientific doctrine or of the best scientific thinking of his day? I, for one, find that the comparison with Sellars's scientific realism can serve to remove the paradox and to make the relation between "Truth" and "Doxa" intelligible. Sellars characterizes the Manifest Image as the product of millennia of conceptual sophistication, and he recognizes it as "scientific" strictly within its empirical ambit. In fact, a large (perhaps the largest) part of Sellars's philosophical oeuvre aims at doing "increasing justice to the manifest image." And yet, the same Sellars does not hesitate to dismiss the latter with such words as "false," "unreal," "disappearing," "non-existent" when what is at issue is not its "refinement," or "increased sophistication" but rather the global comparison and the ontological choice between the Manifest Image and the Scientific Image.

In our own time, the scientific realism of Sellars prepares us for the extraordinary, truly mind-bending developments that have unfolded and continue to unfold in the physical and biological sciences and in mathematics—in the twentieth century and beyond it. As the Scientific Image gains in scope and explanatory power, the theoretical objects and principles it postulates become ever more imagination-defying, counter-intuitive, and even thought-defying. And here is what I see today, in the perspective of 2013, as Parmenides's greatest bequest, not only to his contemporaries and Greek successors, but more broadly to philosophy, to science, to humanity. The Manifest Image in its history, over centuries and even over millennia, comprises glorious achievements and break-

throughs in science and the sciences—all still within the framework of the Manifest Image. In Parmenides's time there were major achievements in *historiē*, "empirical investigation," that led to the astronomical breakthroughs presented or cited in "Doxa." Nonetheless, we today have been compelled to recognize, as Parmenides urged his contemporaries to recognize with respect to the *eon* and "Truth," that the theoretical objects and principles of the Scientific Image are bound to defy human imagination and ordinary modes of thought. In the Parmenides context, no entity with which we are familiar, no entity of the manifest world, satisfies even those four fundamental constraints on the *eon* that are generally accepted by interpreters as having been put forward in B8.⁴⁷ Parmenides was rash, no doubt, when, borrowing the voice of a goddess, he proclaimed his deduction final and foolproof. But Kant too was rash, as Sellars has argued, when Kant proclaimed that all noumena (not just those that involve our identity as moral agents and appraisers of value) lie for ever beyond the reach of postulational science.

47. See above, p. 104.

7 ∞ Where Are Love and Strife? Incorporeality in Empedocles

I. THE PROBLEM

Empedocles insists that the forces of Love and Strife are necessary for the mixtures and separations that produce the visible cosmos (B17; esp. lines 19–20); he also seems to give them distinct and different spatial locations in the different stages of the cycles between their triumphs (B35, B36). If we analyze the local mixtures that constitute sensible things, we will find various ratios of earth, water, air, and fire (B73, B98), but Love (and, apparently Strife) cannot be discovered by this kind of empirical analysis, and this is not because they are too small to be seen (B17.25). So we face the question: where are Love and Strife? To answer the “where” question, we need to answer the “what” question first: what *are* Love and Strife? A common (but not universal) view is that they are body-like elements, metaphysically equal to the four roots, earth, water, air, and fire, and also of a similar corporeal nature.¹ But why suppose that Love and Strife are bodily?

This paper argues that, while Love and Strife indeed share foundational metaphysical status with the roots, they are not material, and they

1. See, for instance, Burnet, *Early Greek Philosophy*, 32 and *KR*, 330 (no discussion of the question appears in the corresponding chapter—rewritten by Schofield—in *KRS*). McKirahan, *Philosophy before Socrates* (hereafter *PBS*), 260–61, is agnostic on the question, but seems to think that they are matter-like, because of the spatially-tinged language Empedocles uses to describe their action and because they occupy different places in the universe at different times. Sedley, *Creationism*, accepts the materiality of Love and Strife. Brad Inwood, David Sedley, and Martha Nussbaum have affirmed their acceptance of this view in the discussion on the occasion of my presentation of “Divinity, Intelligibility, and Human Understanding in Presocratic Thought.” See also Nussbaum, “ΨΥΧΗ in Heraclitus, I and II.”

have no spatial locations. This is not a new interpretation. M. R. Wright claims that Love and Strife are not material, citing (among other evidence) Empedocles's insistence that we must grasp them with *nous* rather than through perception (as in B21), and Catherine Osborne also denies that they are corporeal. I have made similar claims about Love and Strife in several places. Nevertheless, there are those who find these claims obviously false. Formulating and defending the non-corporeal interpretation involves challenging some long-held views about early Greek thought, as well as attempting to clarify some remarkably murky notions. An influential view maintains that Love and Strife must be bodies or stuffs because the Greek thinkers before Plato had no clear conception of immateriality and could conceive no existence other than bodily nature. If this is true, Empedocles could not have treated Love and Strife as incorporeal forces.

Here are six claims that I think are true, each of which is incompatible with the corporealist view.

1. Xenophanes's god does not have a body, and it is non-material.
2. Although the *logos* in Heraclitus is signified by fire, the *logos* itself is not to be identified with a material thing, nor is whatever it is in us that is our capacity to understand the *logos*.
3. Parmenides's what-is (*to eon*) is not a sphere (solid or otherwise); indeed, to qualify as a genuine being on Parmenidean grounds, something need not be corporeal at all.
4. Parmenides does not think that thought (the use of *noos* or our capacity to *noein*) or its object are to be identified with body (except accidentally). The proper use of *noos* is not limited to sensory experience.
5. Anaxagoras's *Nous* is not corporeal.
6. For Empedocles, Love and Strife are immaterial forces.

What these claims share is the idea that there are some basic things in Presocratic philosophy that are not corporeal, or as I prefer to say, are not *stuffs*. There are two different versions of corporealism that I wish to challenge. The first is that the forces of change and motion in Presocratic theories are corporeal. The second is that mind or understanding and its objects are to be understood as corporeal processes and things.²

2. The chronological range here is from Xenophanes through the later Presocratics, including the Eleatics Zeno and Melissus, as well as Anaxagoras and Empedocles. In this story,

It is crucial to note that I am not claiming that there are no Presocratic sources of motion that are material; nor should I be understood to be arguing that no Presocratic had a materialist view of mind or thought and its objects. Clearly these claims would be false. Rather, what I reject is the view that there are no incorporeal entities in early Greek thought because incorporeality or things that are not stuffs could not have been conceived of by the Presocratics. For the purposes of this paper, I shall concentrate on the particular case of Love and Strife as sources of change in Empedocles. I shall argue that they should be understood as immaterial forces and that the arguments marshaled against understanding them that way fail.

Two preliminary points:

1. I have been using the term “incorporeal” (and its cognates). One might also speak of materialism in pre-Platonic thought. Both of these terms (and their cognates) appear, often interchangeably, in those critics who accept the corporeal interpretation of the Presocratics. I do not think that it makes a great deal of difference which terms one uses.³ If one thinks that the use of a concept depends on the presence of a word, then “corporeal,” “incorporeal,” “matter,” “material,” and “immaterial” are all equally suspect, for the corresponding terms are missing in extant Greek texts of the time.⁴ I shall mostly use “corporeal,” for “body” at least appears in Greek writings of the relevant period, but I shall try to make no assumptions about conceptions of corporeality or incorporeality in those texts. There are references to body or shape (Xenophanes B14, B15, B23, for instance), to thinking and understanding (e.g., Heraclitus B40, B113 and Parmenides B3), and to soul (e.g., Heraclitus B36, B45, B85, and B115). The problem is how to understand these references.

2. I shall avoid using the term “physical.” “Physical” and “corporeal” are often used interchangeably, particularly by those expressing the view that the corporeal or material exhausts all that there is. An example ap-

Anaxagoras is a transitional figure, often cited as glimpsing or moving toward a mind/body distinction. See *HGP*, vols. I and II. Yet even on this story, Anaxagoras’s cosmic *Nous* is often interpreted as being a particularly diaphanous body; see Sider, *Fragments of Anaxagoras*, 131, and, most recently, Sedley, *Creationism*, 12, and Warren, *Presocratics*, 132.

3. This is not true in the case of medieval thought, where one can coherently claim that something is both incorporeal and material (e.g., angels).

4. Renehan, “Incorporeality,” 107, defines the notion this way: “Let ‘incorporeal’ mean, quite simply, ‘not having a body,’ and immaterial ‘not possessing or composed of matter.’”

appears in this claim about Melissus: “[W]hen Melissus said that what is has no σῶμα, he meant that it does not have a body of the type possessed by a person or animal, not that it has no *bodily or physical* nature whatsoever” (italics mine).⁵ One way to express the corporealist view is to claim that the real is the physical. In contemporary philosophy, this has come to be called *physicalism*. The notion seems to be that everything that is real can be reduced to an explanation in terms of modern physics. Physicalism is, as T. Crane and H. Mellor say,

... a kind of monism, opposing the dualist’s distinction between two kinds of substance: matter and mind. As such, it is descended from *materialism*: the view that everything is matter—for instance, the view that nothing exists but collections of atoms in the void—as opposed say to Cartesian dualism, which held that as well as matter (extended substance) there is also mind (thinking substance). Many physicalists take their doctrine to be a modern version of materialism: defending the hegemony of modern matter against the mysteries of mental substance and of mind/matter interaction.⁶

Yet, as Crane and Mellor point out, the very notions of physicalism at play in contemporary philosophy are often unclear and confused, and this is true of the notions used by interpreters of ancient philosophy as well. Simply to assert that the physical (or natural, in the ancient sense of *phusis*) is identical with the bodily or corporeal is to beg the question that I am raising. Here is a possible counterexample: pre-Platonic atomists would certainly claim that both atoms and void are parts of nature, hence physical. But surely void is not to be equated with body. The whole point (one might rather exaggeratedly say) of atomism is to claim that there is a part of nature that is not to be identified with body. Void is immaterial and incorporeal. Nor, I take it, is void to be identified with empty space, which contains atoms and in which the atoms move.⁷ This makes atomism no less (and no more) mechanistic, and it makes it no less physicalist

5. Palmer, “On the Alleged Incorporeality of What Is in Melissus.” In correspondence, Prof. Palmer confirms that here, in the context of his discussion of Melissus, the “or” is epexegetical. Warren, *Presocratics*, 132, says of Anaxagoras’s *Nous* that, although it is very different from everything else, “it is still, however, something physical.”

6. Crane and Mellor, “There is No Question of Physicalism,” 185–86.

7. See, for instance, Sedley, “Vacuum.” The status of space in pre-Platonic thought is complicated: for a survey, see Algra, *Concepts of Space in Greek Thought*. In Chapter 1, Algra provides a clear and sensible discussion of the problems of writing about such basic concepts as space or place in early philosophical thought.

in the sense that it attempts to give a naturalistic account of nature. For these reasons, I shall attempt to avoid the terms “physicalist” or “physical” in what follows (although I shall speak of “nature” and “the natural”).

II. CORPOREALISM: THE ALLEGED IMPOSSIBILITY OF IMMATERIALISM

Here is a version of the claim I wish to examine: “Of the first philosophers, most thought that the principles which were of the nature of matter were the only principles of all things” (Aristotle, *Metaphysics* A.3.983b6–7). In Book I of the *Metaphysics*, Aristotle argues for the deficiencies in his predecessors’ principles for explanation, and his account of the earliest thinkers as concerned with material explanation has lingered in claims that, for instance, the Milesians were material monists. Later scholars have also interpreted early Greek thought as failing to reach Platonic and Aristotelian sophistication about the corporeal and incorporeal. Here, for example, is J. E. Raven:

Quite the most striking aspect of the whole history of pre-Socratic speculation is, to my mind, just this: that whereas, with the exceptions of the Milesians at one end of the story and the Atomists at the other, every single one of the pre-Socratics was *striving after* an incorporeal principle, their minds were yet so firmly possessed by the *preconception* that the only criterion of reality was extension in space that one and all they ended in failure.⁸

What particularly interests me in discussions about Presocratic corporealism, as we might call it, is the claim that the early Greek thinkers were striving for something and failing to reach it, and could not have conceived of something immaterial. In discussing the Pythagoreans, Guthrie makes this claim briefly and forcefully: “the only form of existence so far conceivable is bodily substance; hence it [void or air in Pythagoreanism] is thought of as a particularly tenuous form of matter.”⁹ Guthrie’s claims about early Greek thought have been echoed by others (Burkert, Palmer, Sedley, Nussbaum, Inwood) and extended to almost all the Presocratics.

How do we know whether or not early Greek thinkers could *conceive*

8. Raven, “The Basis of Anaxagoras’ Cosmology,” 133. Italics mine.

9. *HGP*, vol. I, 280. It should be noted that Guthrie maintains that Anaxagoras’s *Nous* is not corporeal, although Guthrie does attribute material natures to Empedocles’s Love and Strife.

of something? Why think that such a claim about them is true? The authorities to which many have pointed recently are Robert Renehan's arguments about the concepts of soul and immateriality, and it is to his thesis that I now turn.¹⁰

Put roughly (the refinements will come later), the argument is this: the notion of soul before Plato is certainly that of a corporeal thing. We have no good evidence for the use of ἀσώματος or related terms in any context before Plato; ὕλη (*matter*) is Aristotelian (although there may be hints about it in the *Timaeus*). No one before Plato explicitly says that *soul* is immaterial (ἀσώματος). All existence (for the early Greeks) is bodily existence, so the soul must be something bodily. This is because the Greeks did not and could not have conceived of something other than body.¹¹ The argument goes from the absence of words to describe soul, through a presupposition about bodily existence, to the inconceivability of the non-material.

A first statement of Renehan's view can be found in "The Meaning of ΣΩΜΑ in Homer." The particular details of his argument need not detain us at the moment. What is relevant is that, in arguing for his own view, Renehan cites Guthrie on the absence of a word for "matter" in early Greek thought: Guthrie says that the Milesians had no word for matter "since they knew of no other form of existence . . ." Renehan's approving comment is, "Here is a concept for which the early Greeks had no word precisely because it never occurred to them to question the concept. It was taken for granted."¹² This is basically the same view as that of Raven, quoted above. In a later paper, "On the Greek Origins of the Concepts of Incorporeality and Immateriality," Renehan expands his argument, but it depends crucially on these two claims.¹³

10. See Renehan, "The Meaning of ΣΩΜΑ in Homer," and "On the Greek Origins of the Concepts Incorporeality and Immateriality."

11. Here is an example (Renehan is discussing air): "A substance which seemed barely to share qualities of solid matter, air must have appeared not only to the common man but to some speculative thinkers—who still had no explicit concept of, or word for, immateriality—a reality set apart and special." Yet, Renehan stresses, air is still material. See Renehan, "Incorporeality," 111–12.

12. Renehan, ΣΩΜΑ, 274; the words quoted from Guthrie are a parenthetical comment on *HGP*, vol. I, 82.

13. Renehan's specific target in one part of the paper is the claim (by Gomperz) that both the word and the concept ἀσώματος go back as far as the sixth century. I do not dispute Renehan's philological reasons for rejecting the claim about the word.

There are, I argue, three flaws in Renehan's argument. First, a general point about the strategy of Renehan's claim: it seems to stress the wrong thing and so miss the point. While it may be the case that early Greek thinkers did not think of *soul* as immaterial, nothing at all follows about the *general* conceivability of something that is not corporeal.

Second, there is the claim that early Greek lacked a word for *matter*. In response, we might look no farther than Renehan himself. In his argument against Snell about the Greek $\sigma\acute{\omega}\mu\alpha$, Renehan rebukes Snell for using just such an argument. Snell had claimed that in Homer, $\sigma\acute{\omega}\mu\alpha\tau\alpha$ are *dead* bodies because there are no uses of $\sigma\acute{\omega}\mu\alpha$ in Homer to mean living body. Renehan himself correctly points out that we cannot decide that something is or is not the case because of the absence of a word, or a set of words.¹⁴ In reply to Snell, Renehan says, "It is very questionable whether absence of a word necessarily implies a total absence of the corresponding concept. Language lags."¹⁵ Yet Renehan's own claims about immateriality and incorporeality are ultimately based on the absence of certain *words* in early Greek texts.

Third, like Raven and Guthrie, Renehan assumes that "the Greek mind" accepted unquestioningly the idea that existence entails extension in space:

... the Greeks considered it [the notion of extension in space] so natural and essential an attribute of all reality that it simply did not occur to them at first to deny spatial extension to Being even when they were struggling to divest it of body. Since in ordinary thought bodily matter is that which is extended in space, this attitude was one potent source of confusion when speculation about non-material Being began.¹⁶

This is where the problem really lies. The culprit is the presumption that for the early Greek thinkers, to be is to be matter or body extended in space.¹⁷ So, let us consider this presupposition.

14. In discussions at a conference on the *Timaeus* in September, 2007, both Sarah Broadie and Anthony Long questioned how much weight to give to the presence or absence of a word; Broadie suggested that the attempt to portray notions for which there is not yet vocabulary is not a rare occurrence in early philosophy (including Classical and Hellenistic Greek philosophy).

15. Renehan, "ΣΩΜΑ," 274.

16. Renehan, "Incorporeality," 118.

17. Again Renehan uses a linguistic support. He writes, " $\sigma\acute{\omega}\mu\alpha$ was responsible for another confusion of thought, in my judgment the decisive one. All physical bodies . . . partake of such sensible properties as weight, shape, extension in space, not insofar as they are *bodies*, but in-

The corporealists certainly assume the truth of their claim. It is this that drives the assertion that Parmenides's what-is must be a solid sphere, this that supports the claim that Love and Strife are corporeal entities, and this that leads scholars to claim that Anaxagoras's *Nous* must be corporeal or material in some sense. I want to argue that we have no good reason to think that this presupposition is correct. What we have to do is examine the evidence and see where it leads us; but that evidence must be examined as impartially as possible.

Consider the case of Parmenides: in B8 Parmenides explores the connection between thought and what-is. What-is is completely graspable by *noos* and completely understandable. What-is is perfectly and completely what it is. He explains:

Further, since there is an outermost limit, it is completed,
like the bulk of a well-rounded sphere from every side
evenly matched from the center everywhere; for neither somewhat larger
nor somewhat smaller here or there may it be;
for there is neither what-is-not, which might prevent it from reaching
the same, nor is there any way in which what-is could be
here more or there less than what-is, since it is all inviolate;
for, equal to itself from every direction, it lies equally in the bounds.

(B8.42–49)

Note that Parmenides does not say that what-is is a sphere. Rather, he says that its perfection of completeness (its being *τετελεσμένον*) is like that of the expanse of a ball.¹⁸ What this means, as Mourelatos persua-

sofar as they are *matter*. In the fifth century *σῶμα* still bore a predominantly literal meaning—human or animal figure; at the same time the nature of matter was imperfectly understood. There was as yet not even a word for it. The consequence of this state of things was that it was possible to conceive of Body and Matter as two distinct entities. So long as *σῶμα* had a rather restricted meaning and matter was both vaguely conceived and nameless, no thinker was in a position, either linguistically or conceptually, to perceive clearly that a denial of Body necessarily involved a denial of properties which Body had not *qua* Body but *qua* Matter” (ibid., 119).

One might reply (using the corporealists' own argument) that, just as the early Greeks had no word for *matter*, neither was there a word for *space* in the relevant sense. There is certainly a word for *empty*, but to say that a bottle is empty is not to imply that it is full of space. For complications with respect to this particular case, see Algra, *Concepts of Space*, 15–16 and 39–40. The corporealists should not respond that the notions were so obvious and so universal that there was no need for such words. For if that argument works for matter and space, it might just as well work for immateriality or incorporeality, and that is exactly what the corporealists want to deny. But, as we have seen, such a response has no real value.

18. The perfect here gives the state of having been completed; it is non-temporal.

sively argued more than thirty-five years ago, is that for Parmenides what-is is “perspectively neutral”: no matter how one thinks of what-is, one thinks always of the same thing. One always grasps in thought something that has no internal differences that could change its character regardless how one thinks of it.¹⁹ Some commentators still insist on the corporeal view of Parmenides. Renehan is one of these, David Sedley another.²⁰ But that interpretation attributes to Parmenides an incoherent view. On this account, what-is is a perfect material or extended sphere held by the force of Necessity. Parmenides himself says that there is no what-is-not to prevent it from being in the same state all through. If we take that in a corporeal sense, we have to say that there is no void, no empty space. If that is true, what is the ball of being resting in or on? It cannot be unlimited in extension; that would be inconsistent with Parmenides’s careful arguments that what-is is limited, held in. It cannot be something that is, yet different from what-is: that would be what-is-not. So, if what-is is corporeal, Parmenides contradicts himself. But that seems unlikely in a philosopher who is so quick to use *reductio* arguments. It seems particularly unlikely that Parmenides would choose as the culminating image of the goddess’s oration one that committed her to a contradiction.²¹ This is one case where the corporeal assumption drives us to an interpretation that would be otherwise unacceptable.

19. Mourelatos, *The Route of Parmenides*, 122–30. I have also argued further for this in Curd, *The Legacy of Parmenides*, and this view is also accepted by others. A careful discussion of and concurrence on the metaphorical view is McKirahan, “Signs and Arguments,” 210–14; Warren, *Presocratics*, 98–99 also opts for the non-literal interpretation.

20. Renehan in “Incorporeality,” Sedley in “Parmenides and Melissus.” Sedley on the relevant lines: “This certainly *sounds* like a literal geometrical description of its shape” (Sedley, “Parmenides and Melissus,” 121; Sedley’s italics).

21. Sedley is unwilling to accept the notion of the sphere as a simile in Parmenides: “Unless someone can find a plausible metaphorical interpretation of ‘larger’ and ‘smaller,’ one that leaves Parmenides with a real argument here, we have little choice than to take them in their literal spatial sense” (Sedley, “Parmenides and Melissus,” 121). But a literal reading of “larger or smaller” also raises problems, for a literal, corporeal, sphere is inconsistent with the denial of divisibility. It can be divided into larger or smaller parts; even if it is not literally divided, it can be so in thought. Even if what-is is simply extension without matter, it must be limited, so there must be non-extension (or what-is-not) outside it. Yet the unreality of what-is-not is specifically what Parmenides denies. It seems the only way to give Parmenides a coherent theory is to move beyond the corporeal-extensionist-materialist interpretation. In *Creationism*, Sedley remarks, “the onus of proof is on anyone who wishes to deny the literal reading” of the sphere in Parmenides (32n5). McKirahan’s arguments and conclusions suggest otherwise. It is also worth comparing Plato’s *Symposium* 211b3–5; the Beautiful itself becomes neither more nor less (or,

What is misleading is the notion that *matter* or *extension* is such an obvious notion to the early Greeks, and that their problem lay in learning how to think of the immaterial. Look again at this claim: “their minds were . . . firmly possessed by the preconception that the only criterion of reality was extension in space” (Raven); this makes the early Greek thinkers Cartesians. (Cartesians without soul, but that’s part of Renehan’s point about the missing immateriality of soul.) Discussions of the Milesians make a similar point. These material monists think of some matter (water, *apeiron*, air) as an underlying reality (substance) that *transforms* into other things while (at least on the monist view) somehow maintaining its own special watery or airy character. This is an Aristotelian interpretation: the underlying *subject* that gains or loses *properties*. These subjects occupy space and are moved through it by the action of matter itself (the hylozoism that Guthrie, for instance, attributes to the pre-Parmenidean thinkers). Thinking of things as subjects in this way already involves conceiving them as combinations of matter and form—the subject, what is to be enformed, the properties enforming the subject in certain ways. This matter/form view holds at every level: whether of Aristotelian primary substances (ensouled bodies), or simple alterations as when the man becomes musical by, as “matter,” taking on a new “form.”²² I doubt that this is correct as an interpretation of early Greek philosophy. Rather, I think of the Presocratic basic things generally as stuffs and powers: the hot, earth, the cold, fire, water, the moist, etc., all mixed up together. There will be certain differences among the theories (earth and water play special roles for Xenophanes at the level of the Earth, cloud higher up; for Heraclitus the opposites and their processes, as controlled by *Logos*, are basic). For Aristotle, *form* and *matter* are congruent terms: matter is co-extensive with form.²³ Thinking this

neither greater nor smaller) no matter what happens to the things partaking of it (μηδὲν ἐκεῖνο μήτε τι πλέον μήτε ἔλλατον γίνεσθαι μηδὲ πάσχειν μηδέν). Since the Beautiful itself is clearly not corporeal and is clearly not subject to becoming, this must be read metaphorically. (I recognize that Plato says explicitly that the Beautiful is not body, so the non-metaphorical interpreters will not see this as reliable evidence. Yet this passage in the *Symposium* is steeped in Parmenidean references, and I take Plato himself to be reading Parmenides metaphorically here.)

22. See Frede, “Individuals in Aristotle”; his views are further developed and the point expanded by Mann, *The Discovery of Things*.

23. Ryan, “Pure Form in Aristotle,” suggests that form without matter is impossible in Aristotle. The unmoved mover is *ousia*, pure actuality. As unmattered it cannot *have* form, much less be pure form.

way invites one to study *material* matter and *immaterial* form in their own right—to write the *Metaphysics*, perhaps. But this is not what the Presocratics did. Parmenides offers an example: his cosmological model is the mixing of ingredients to produce the natural world.²⁴ This example stands, whether or not one takes the *Doxa* as serious cosmology, a critique of cosmology, or an extended jest; and once Parmenides offers mixture as a model, it becomes the standard explanation of the coming-to-be and changing of the things that the world presents to our senses. The problems that post-Parmenidean thinkers face are (1) how to explain the processes of mixture and separation, and (2) how to produce structure from mixture.²⁵ This is not to deny that these stuffs (and perhaps even the opposites) are corporeal, but I deny that these are to be thought of as *matter*, in the sense of an uncharacterized extended something waiting to be characterized.

Further, I do not think that the Presocratics conceive of their stuffs as things *in space*. The very concept of space is one that both Plato and Aristotle wrestle with as something new and very difficult, and not at all intuitively obvious. The empty (*to kenon*) is not space. In pre-Platonic atomism, the void is what separates atoms, it is not a container for atoms. It is moved just as the atoms are, like the interstices in a sponge or, as Sedley suggests, the vacuum in a flask.²⁶ Rather, the stuffs (whichever stuffs a theory requires) are what there is, and their mixtures produce the world that we perceive. An excellent example of this is to be found in Anaxagoras B17:

Anaxagoras says clearly in the first book of the *Physics* that coming-to-be and passing-away are combining and dissociating, writing this: “The Greeks do not think correctly about coming-to-be and passing-away; for no thing comes to be or passes away, but is mixed together and dissociated from the things that are. And thus they would be correct to call coming-to-be mixing-together and passing-away dissociating.” (B17 = Simplicius *in Phys.* 163.18)

The two problems, of process and of structure, are faced by all later thinkers (including Plato) before Aristotle, who finally introduces spe-

24. Consider B12 and the goddess who supervises mixture.

25. See Mourelatos, “Quality, Structure, and Emergence” and Curd, “The Metaphysics of Physics.” There are similar questions to be asked about the status of Platonic particulars (see Mann and also Silverman, “Timaeon Particulars”).

26. Sedley, “Vacuum.” See also Algra, *Concepts of Space*, 46–51.

cific sorts of causes to explain them. It is these problems that lie behind the move to immaterial forces in most of the claims with which I began this paper.²⁷ These problems become particularly acute after Parmenides, but I think that they are present in theories before Parmenides and that devices like Xenophanes's god and Heraclitus's *Logos* are their attempts to deal with them. Early thinkers (and here I mean Heraclitus, Anaxagoras, Empedocles, and the pre-Platonic atomists) see structure as a function of ratios and proportions of ingredient stuffs. If this is so, then their theories are going to be concerned with problems of the arrangement of stuffs in appropriate proportions, rather than questions about matter as such. Thus, the germ of the idea of the immaterial in the Presocratics will be found in their accounts of process, change, and structure, rather than in their accounts of *soul*. Concentrating primarily on immaterial or incorporeal soul as the source of this notion takes us in the wrong direction. To be sure, in those theories that do include the soul, soul might be thought of a (corporeal or incorporeal) source of change and arrangement; but as such, soul is an instance of the larger questions about the sources of change, arrangement, and organization.²⁸ The major questions, then, are about the forces for moving and arranging stuffs. I turn now to Empedocles and his attempts to solve these problems.

III. THE ROLES OF LOVE AND STRIFE IN EMPEDOCLES

I begin with B17, where Empedocles lays out most clearly the foundations of his theory:

But come, attend to my story, for learning will augment your mind
(φρένας):
for, as I also said before, declaring the limits of my story,
I shall tell a double tale: For at one time they grew to be one alone
from many, at another, again, they grew apart to be many from one.

27. The others have to do with *noos/nous* and its objects. I take them up in the other part of this study.

28. For instance, the single use of *psychē* in Empedocles (B138) is a reference to life, which is "drawn off" or ended, with a bronze knife, presumably by causing loss of blood. See Wright, *Empedocles*, 288. The shedding of blood is the terrible source of the fall of *daimōns*. See Osborne, "Sin and Moral Responsibility." Empedocles apparently does not treat soul as the source of organization, motion, or character (as motivating actions), but he is certainly interested in all of these problems.

Fire and water and earth and immense height of air;
 and baneful strife apart from them, equal in every way,
 and love among them, equal in length and breadth.
 You, gaze on her with your thought (νόφ), and do not sit with stunned eyes.
 And she is thought even by mortals to be inborn by nature in their limbs,
 and by her they think kindly things and complete unified works,
 calling her by the names Joy and Aphrodite.
 No mortal man has known her as she whirls among them. (B17.14–26)

First, Empedocles names four basic things: the roots fire, water, earth, and air (line 18). He then adds strife (νεϊκος) and love (φιλότεος) to the list. The way that these two are added suggests that they are different in kind from the roots. In B21, Empedocles expands the discussion of Love and Strife:

But come, gaze on this witness to my earlier words,
 if anything in the previous [words] was defective (λιπόξυλον) in form
 (μορφῆ):
 the sun bright to see and hot in every way,
 the immortals [heavenly bodies], drenched in heat and in shining light,
 rain, in all things dark and chilling;
 and from earth flow out things rooted and solid.
 In rancor all become multi-formed and asunder,
 but in love they walk together and yearn for one another.
 From these everything, as many as were and as many as are and will be
 hereafter
 sprouted, trees, and men, and women,
 beasts, and birds, and water-nourished fish,
 and long-lived gods, first in their honors.
 For these very things are, and running through each other
 they come to be different shape; for the mixing (κρῆσις) changes them.
 (B21.7–8)

Love and Strife are active, pushing and pulling the roots into and out of arrangements. (These include the two great cosmic arrangements of the Sphere at the triumph of Love and the complete segregation of the roots at the triumph of Strife). Empedocles claims that all the contents of the cosmos are reducible to the four roots. The mixture of the roots alters their appearance, so that the multitudinous forms on earth and in the cosmos are manifested. Love and Strife each cause both mixing and separation:

Love brings together things that are unlike, and thus separates things that are like; Strife separates unlikes and brings together likes. With only one of these at work in the cosmos, there would be either the sphere or complete separation, but the cycles in between would not occur.²⁹

It is clear that Love and Strife are the sources of mixture and separation, and that as such they act over time and are distinct from those things on which they act. What is open to question is their natures. Are they of the same kind as the roots, or are they, as I have already suggested, of a different, immaterial or incorporeal kind? Brad Inwood, the editor of the influential Phoenix Presocratics Series' *Empedocles* volume, is adamant about their material status:

Like the four roots, love and strife are conceived as physical stuffs. As yet, no Greek had articulated a conception of incorporeal being, and what evidence there is in Empedocles suggests a physical view of these "gods." Fragment B17.19–20 and the phrase ἴσα τε πάντα ἀτάλαντον ἀπάντη has a roughly similar meaning. Love may, according to B17 be invisible to the eyes, but that of course proves nothing about corporeal status, any more than the injunction to "gaze on her with your understanding." She is, moreover, held to be part of our mortal limbs (line 22). Several references to her role in compounding things suggest that her binding power is like that of glue, that is, she enters into the compounds which she binds together. Strife and love both engage in spatial movements (B35 etc.). There can be no serious question about their corporeality. If Empedocles is vague about the meaning and implications of corporeality and speaks at times as though love or strife was an incorporeal power, that must be put down to the conceptual naivety of his day. It is unreasonable to expect a clear conception of the corporeal and its nature until the incorporeal is invented to contrast with it.³⁰

I quote Inwood's claim at some length, because it clearly reflects the Renehan view, as shown by his talk of conceptual naivety and the particular passages of Empedocles that he cites as evidence. He argues that the passages to which he refers support his corporeality interpretation; yet

29. Although Love and Strife are each sources of separation and mixture, this is consistent with Empedocles's preference for one (love) over the other (strife), at least from the perspective of a mortal human being. For a minority view on the goodness of Love, and hence its preferential status for Empedocles, see Kingsley's *Ancient Philosophy, Mystery, and Magic* and "Empedocles in the New Millennium."

30. Inwood, *The Poem of Empedocles*, 48. I have removed the Inwood numbering and left the DK numbers.

these are the same passages that Wright cites in support her own non-corporeal view. (Wright takes the passages metaphorically, citing Parmenides's use of the sphere analogy.) Inwood's argument rests on two points. The first is the influential view: the inconceivability claim. Until the incorporeal is invented (which no one had yet done), the corporeal remains inconceivable. The second is his claim that Love acts as a glue, "entering into compounds," and must thus be understood as a bodily agent. I have already argued that the inconceivability claim cannot decide the issue, and I have tried to show how Presocratic thinkers could begin to see the need for something radically different in kind from the basic stuffs. That leaves Inwood's glue argument to be evaluated.

The claim is that Love is an attaching stuff, Strife a dissolving stuff. When Love is added to some of the roots, they stick together, just as adding glue to two pieces of paper will make them sticky. When Strife is added, the bonds dissolve, as happens when rubbing alcohol dissolves the residue left by a gummed tag on a cup. There are three problems here.

1. If Love and Strife are stuffs like earth, water, air, and fire, then it would seem that their own activity is in need of some further explanation. Fire is manifest as light and heat where it is present (B21), but it does not mix with other things or move around except under the influence of Love and Strife.³¹ So, what moves the glue stuff to certain places rather than others? Why does the dissolving stuff operate now *here* and now *there*? (This is a form of Parmenides's question in DK 28B8.9–10.) Interpreting Love and Strife as stuffs just pushes this question back a level. If the glue stuff is not self-moving, then what moves it? If glue stuff is self-moving (as it were), why not just put the motions into the roots? Consider the glue on the scraps of paper: unless the two pieces are pushed together and held, the glue will not bond them. What Empedocles needs are forces of attraction and repulsion that explain why this mixture appears here and now and remains mixed. Love and Strife as stuffs cannot provide that explanation. Can the mere presence of Love-stuff be sufficient to separate likes and bond unlikes? Consider a flour, salt, water paste. The presence of water is not enough to bond the salt and flour into paste: there must be the force of a mixing motion (the liquid and the dry stuffs must be made to run through one another). That force is not inher-

31. I discuss the question of self-motion and the roots below.

ent in the ingredients, for leaving the ingredients alone in a bowl will not produce the paste; it must come from outside as it were, imposed on the stuffs to mix them sufficiently.

2. As I mentioned above, Love not only mixes ingredients together, she separates them apart. It is because of Love that all the earth does not stay together (segregated with its own kind), but is mixed with the other kinds of roots to form the multitudes of mortal things. Strife may dissolve mortal things, but it also mixes each of the roots and causes each to cling to its own kind. Why should this happen, given the (*ex hypothesi*) stuffy or corporeal characters of Love and Strife? On the stuffs view, it becomes difficult to explain this: we would not normally appeal to solvent stuff to explain why like things *hold together*, nor would we appeal to glue-like stuff to explain why like things are *separated from* each other. Yet, Love and Strife can serve as fairly good explanations here: it is the attractive power of Love that can cause unlikes to mix (and separate from their own kind) and it is the repulsive power of Strife that can break mixtures (of different kinds) and can cause like ingredients to cling to one another.³² No one who has ever experienced the emotions of love and hate in personal or political circumstances needs convincing of this.

3. How, on the stuffs model, can Empedocles explain the strengthening and weakening of Love and Strife at different phases of the cycle? As we shall see, he uses spatial language to speak of the waxing and waning of Strife and Love, but if Love and Strife are stuffs, he can only explain the cycle by changes in the concentrations of the two. Yet the language of the fragments does not suggest this. Rather, it is the forceful dynamic power of Love and Strife that Empedocles stresses:

For these very things are and running through each other
they become men and all the other clans of beasts,
at one time coming together in love into one kosmos,
and at another each being carried apart separately by the hatred of strife,
until growing together as one they come together, subdued, into the whole.
(B26.3–7)

It is the hatred of strife (its emotive and motive power) that carries things apart. There are no particles of the solvent Strife carrying particles of

³² Because Empedocles's world is a plenum, any breakup of a mixture will result in another mixture.

fire or water away. Moreover, we must face the question of how such solvent particles could do their work—by being bonded to the particles of the roots so that the roots can come apart from each other? What would then bond strife to the other roots? We would seem to need a further bonding stuff, and then yet another.

These three problems suggest that the corporeal interpretation cannot make sense of Empedocles's view. If we reject that interpretation, and do not worry about when and how Empedocles could have come to have a notion of the incorporeal, but rather think about the problems that Empedocles faces in terms of arrangement and structure, we have good reason to reject the corporealist or stuffy analysis of Love and Strife and to accept the forces interpretation of Wright and others, with its attendant commitment to something that is not of the same stuff-kind, something that we could call incorporeal. We need to explain why the four roots (the Empedoclean stuffs) are arranged and structured as they are. Empedocles has his own answer and arrives at it by his own method: look at the world around us, generalize, and expand. The arranging and structuring are attributed to the actions of Love and Strife. When *we* are moved by Love and Strife, it is not because some stuff has been added to our composition. (There is no love potion at work.) Rather, Love and Strife are forces that move us to act.

And the kindly earth received into its broad-chested hollows
two (of the eight parts) of the brightness of Nestis
and four of Hephaistos; and these became pale bones
fitted together by the marvelous glues of harmony. (B96)

But if your conviction (πίστις) about these things is at all defective
(λιπόξυλος):

how from mixing of water earth and aether and sun
forms and colors of mortals could come to be

(those which now have come to be), fitted together by Aphrodite. (B71)

. . . as when *opos* (juice of the fig tree) bolted and bound white milk. (B33)

Empedocles appeals to propulsive and repulsive forces that arrange the roots, forces that act as we do when we are motivated by desire and repulsion. These passages invoke agency, and agency is not (at least *prima facie*) to be explained by adding more stuffs of the same kind:

Just as when painters adorn votive offerings—
 men well taught by cunning in their craft (εὖ δεδαῶτε)—
 who when they take the many colored paints in their hands,
 mixing (μείξαντε)³³ in harmony more of these but less of those,
 out of them making (κτίζοντε) shapes resembling all things,
 bringing into being trees and men and women
 and beasts and birds and water-nourished fish
 and long-lived gods best in honors.
 So in this way do not let deception overcome your mind
 [to think] there is any other source for mortal things, as many as are
 seen, countless, perishable,
 but know these things clearly, having heard the story from a god. (B23)

The pigments (roots) are a crucial part of the analogy, to be sure; but what makes the analysis work is the action of the painters, who are cunning and, knowing the materials, can force them to separate from their likes and blend with their unlikes to produce the many shapes. Here is the appropriate forceful action of agents on the stuffs that can arrange and structure them.³⁴ Consider again a pair of fragments that we examined above:

But if your conviction (πίστις) about these things is at all defective
 (λιπόξυλος):
 how from mixing of water earth and aether and sun
 forms and colors of mortals could come to be
 (those which now have come to be), fitted together by Aphrodite. (B71)
 . . . as when *opos* (juice of the fig tree) bolted and bound white milk. (B33)

We can read B33 as an example of the process referred to in B71. The curdling of milk (a liquid) by adding fig tree juice (also a liquid) results in

33. Text as in *DK*.

34. Both Trépanier, “Empedocles on the Ultimate Symmetry of the World,” 35–36, and Ierodiakonou, “Empedocles on Colour,” 4n2, point out that the dual constructions in this text imply two artists at work, i.e., both Love and Strife. Sedley, *Creationism*, 59 with n87, follows, although there are disagreements among the three about the significance of there being two painters. Empedocles’s explanation here is not the only one possible: Democritus had a different answer, one that is partially corporealist (leaving out the problem of void). The random motions of atoms of different sizes and shapes produce the world that we perceive; this is the result of necessity. Plato and Aristotle were famously unimpressed by that answer, precisely because it cannot account for repeated arrangement. This is not merely Plato’s complaint about Anaxagoras transferred to Democritus; one can argue for teleology and development without requiring the presence of the Form of the Good.

a changed texture—solid curds or cheese. The example shows, as no argument could in the absence of any sort of molecular analysis, that the mixing of ingredients can result in something quite new and different in kind, as long as the ingredients are of a kind to mix and are propelled together in the appropriate way. Other fragments use illustrations to show that the sort of explanation that Empedocles proposes is indeed possible. In a number of cases, Empedocles invokes the image of Aphrodite (or Kypris) as a mechanic; in B87 (which probably connects with material in B85 and B86 about the development of eyes) he says that “Aphrodite wrought them with bolts of love” (γόμφοις ἀσκήσασα καταστόργοις Ἀφροδίτη).³⁵ In addition to the bolts, there are also glues. B34 speaks of gluing barley meal with water, and at B96, one of the “recipe” fragments, Empedocles describes the formation of bone:³⁶

And the kindly earth received into its broad-chested hollows
two (of the eight parts) of the brightness of Nestis
and four of Hephaistos; and these became pale bones
fitted together by the marvelous glues of harmony. (B96)

Moistened earth is “fired” much as pottery is; the formula for bone would be $E_2W_2F_4$ and the high proportion of fire accounts for both the hardness and the paleness of bone.³⁷ The mention of the “glues of harmony” makes explicit the metaphorical character of both the glue and the action of Aphrodite. There is no literal glue, there is no material Harmony itself, just the mixing of the roots which have tendencies to combine in certain ways. This is supported by a parallel passage at B73, where Kypris is mentioned as the motive force: “as when Kypris, being busy producing forms, moistened earth in rain, and gave it to quick fire to harden.” “Giving it to fire to harden” (in B73) suggests that in B96 the hardness of bone is produced by the heat of the predominant ingredient, fire, but the fire must be nudged into mixing by Love.

The peculiar character of each root, which it can pass on to mixtures, is referred to in B21, and B17.27–28. Differing ratios and degrees of mix-

35. See also B95 (also part of the discussion of the formation of eyes, according to Wright), where things “grew together in the hands of Kypris.”

36. The other explicit recipe is B98, which gives instructions for making flesh and blood.

37. Note that bone does not contain air. The doxographers claim that it is the preponderance of fire that accounts for hardness and paleness: see Simplicius *in de Anima* 68.11–14; Philoponus and Sophonias agree. See Wright, *Empedocles*, 210.

ture are responsible for the differing characters of the mortal things that come to be by this process. In B98 flesh and blood have the same recipe: earth, water, air, and fire in equal proportions; yet the texture of flesh and blood differ, implying different particle sizes for the ingredients, and that there can be more or less thorough mixtures.³⁸ The roles of Love and Strife are irreplaceable: for it is in their actions as propulsive and repulsive forces that the whole system gets underway and is maintained. The most complete mixture is that of the roots in the Sphere, where no strife is operative.

Inwood raises an objection to this sort of account. Perhaps the roots are material stuffs endowed with their own motion; thus there is either no need at all for Love and Strife in the theory, because their roles as forces becomes redundant, or even if we need Love and Strife as causes of cosmic motion, there is no impediment to Love and Strife being material entities with their own peculiar motions of gluing and dissolving.³⁹

I make the following response. First, I think we must be very careful in attributing inherent motion to the roots. Inwood offers as evidence B35.6 (the roots voluntarily came together), and the comment in B53 that “[air] chanced to run this way then, but often in another . . .” Inwood’s claim is that “it is only in the context of the overall pattern of the cycle and of the specific blending of the roots into a given compound that love and strife appear to take on the role of efficient causes.” Yet one is inclined to ask what other sorts of change there are? The cosmic changes are the direct effect of the activities of Love and Strife. The cosmic whirling begun by the action of Love and the breakup of the sphere caused by the action of Strife are the forces at work throughout the cosmos. That whirl, and the local actions of Love and Strife within it, control all change

38. I have discussed this issue in Curd, “Metaphysics of Physics,” 151–52. We can see the difference if we think of mixtures in cooking of the same ingredients in different proportions or even mixtures of those ingredients in the same proportions but using different sized chunks.

39. Inwood, *Poem of Empedocles*, 29: “. . . it seems that the roots themselves are endowed with the ability to move on their own; Aristotle’s tendency (A37) to present the roots as inert material causes, and love and strife as active efficient causes, is an exaggeration. Nowhere does Empedocles make love and strife the exclusive or even the principal causes of motion—in-
deed he usually speaks of the roots as moving and mixing on their own [B35.6] under love and strife, as ‘learning’ to do this or that, as having a tendency to combine with like elements, and so forth; it is only in the context of the overall pattern of the cycle and of the specific blending of the roots into a given compound that love and strife appear to take on the role of efficient causes.”

and motion. The things that happen by chance (that headless necks acquire limbs, that air runs in this direction and then that) are those that *seem to us* as observers to be chance, but we are observing only a small part of the cosmos and only a small part of the cycle that we take to be the whole:

For narrow devices are spread over the limbs,
 and many wretched things burst in, and these blunt their meditations.
 And after observing a paltry portion of life in their living
 quick-dying, like smoke they are lifted up and wafted away to their doom
 (δίκη).

Each one persuaded only by that which he has chanced to meet,
 they are driven in all directions, yet each exults in having seen the whole;
 In this way, these things are neither seen nor heard by men,
 nor grasped with the understanding (νόω) . . . (B2)

We assume that the point of the cosmos (as it were) is to produce us, but according to Empedocles this is a mistake.⁴⁰ There is an oracle of necessity: the cosmos unfolds and cycles as it does because Love and Strife play the roles that they do, not because the cosmos aims at the production of human beings. As stuffs, the roots may have certain characters (earthy, airy, etc.) that manifest themselves as tendencies to move and react in different ways. But without the forces of Love and Strife these tendencies would not manifest in the motions that we see that are the evidence of the great cycles.

With this in mind, I think we can see that B35 does not imply that the roots are self-moving in a way that would obviate the need for Love and Strife:

When strife reached the lowest depths
 of the whirl and love got to be in the middle of the eddy,
 there all these come together to be one alone,
 not all on a sudden, but willingly coming together each from another place.
 As they are being mixed, countless clans of mortals poured forth:
 but many stayed unmixed, alternating with those being mixed,
 those that strife still holds high up. For it has not yet blamelessly
 moved out entire to the farthest limits of the circle,
 but some of it [Strife] stood fast in the limbs, while some had moved out.

40. I discuss this in Curd, "On the Question of Religion and Natural Philosophy."

And as far as ever it had run ahead, so far went
 the gentle-minded immortal attack of blameless love.
 Suddenly, the things which before learned to be immortal grew mortal,
 and pure things that before were unmixed mingled their paths together.
 As they were mixed, unnumbered clans of mortal things poured out,
 fitted together in forms of all sorts, a wonder to behold. (B35.3–17)

Further, this passage indicates the roles of Love and Strife as local causes, as well as cosmic:

This is clear in the bulk of mortal limbs
 at one time all the limbs come together⁴¹ into one by love,
 those who have obtained (λέλογχε) a body in the flower of blooming life;
 at another time again, severed by evil strifes
 they wander, each of them asunder, round about the breakers of life.
 It is the same for shrubs, and fish in their watery houses
 and mountain-laired beasts, and winged tumbling birds. (B20)

Rather than removing Love and Strife, this passage seems to put them right where they should be: at the center of any explanation of the ordered processes of the cosmos. So, there is no good reason to regard the roots as having their own sufficient motion, and so no grounds to view Love and Strife as stuffs with inherent motive forces.

IV. WHERE ARE LOVE AND STRIFE?

Another potential problem for my non-stuffy interpretation of Love and Strife is that Empedocles often uses spatial language in picturing the action of the two:

Moreover, when strife had been nourished great in its limbs
 and leapt into its honors, as the time was accomplished
 that has been driven through by a broad oath, for each in turn. (B30)

While they were joining together strife retreated from them towards the
 extremity. (B36)

When strife reached the lowest depths
 of the whirl and love got to be in the middle of the eddy,
 there all these come together to be one alone,

41. Simplicius: συνερχόμεν; the papyrus, now followed by Inwood: συνερχόμεθ'.

not all on a sudden, but willingly coming together each from another place.

(B35.3–6)

. . . Similarly all these things through each other

. . . other places . . .

in the middle we [they?] come to be one alone.

But when Strife . . . passed over the depths . . .

. . . and love in the middle of the whirl

. . . all these come together to be one alone. (B17.54–59 = Strasbourg a(ii)

15–20)⁴²

Obviously, the language is highly metaphorical. Indeed, unless one were already committed to the corporeality of Love and Strife, it would be difficult to take all these passages as evidence for the material nature of the two. The talk of withdrawal, presence, and so on speaks to the waxing and waning of the force or influence of Love and/or Strife.⁴³ That influence is not dependent on the physical presence of a stuff, for, as I have argued, it is not as stuffs that Love and Strife can play their roles. Undoubtedly Empedocles regards the formation and breakup of the Sphere and the cycles in between as actual real events. The Sphere itself is a complete mixture of all the roots, absolutely harmonized so that no differences could be perceived in principle, even had there been any perceivers (compare with Anaxagoras's original mixture). Although love and strife are *physical*, in the sense of belonging to the natural world, they are not corporeal stuffs with locations and local movements.

My account is inconsistent with an interpretation of the *daimons* as bits or particles of Love. That interpretation makes the *daimones* immortal, survivors of both the complete mixture in the Sphere and the complete separation under Strife.⁴⁴ If the *daimones* are particles of Love, then Love must be stuff-like, so that there can be particles of it. There are two

42. Here is the translation by Martin and Primavesi, *L'Empédocle de Strasbourg*, 135, 137, from their reconstructed text: "And in just the same way all these thing [i.e., the elements] were running through one another, and having been driven away, each of them reached different and peculiar places, self-willed; and we were coming together to the middle places, so as to be only one. But whenever strife has reached the depths, thus violated, of the whirl, and Love has come to be in the midst of the eddy, then under her [i.e., Love], all these things unite so as to be only one."

43. See Graham, "The Topology and Dynamics of Empedocles' Cycle."

44. This view was proposed by Cornford in his *From Religion to Philosophy* and has been followed by Kahn, "Religion and Natural Philosophy"; O'Brien, *Empedocles' Cosmic Cycle*; and Martin and Primavesi, *L'Empédocle de Strasbourg*, 83–86.

parts to this claim. First, that the *daimones* are immortal (surviving the Sphere and the separation), and second, that there is textual evidence for the identity of the *daimones*: there are places in Empedocles's text where he claims that "we" are moving into the Sphere or into the depths of strife. The relevant "we" is the *daimones*. I reject both of these interpretations; here I can only mention some claims that I have argued for elsewhere. The *daimones*, like everything else except the four roots and Love and Strife, are not immortal in the proper sense: they are long-lived, but just like the long-lived gods, they are temporary mixtures of the roots. Like all such mixed things, they are mortal and perish at the extremes of the cycle. They may (and do) outlast their human bodies (Empedocles says that he himself has been a boy, a bush, a fish, a bird), but they are not immortal in Empedocles's special sense. There is, then, no reason to claim that they must be bits of love because, otherwise they would not be immortal. Second, I do not accept the first person plurals in the text that Primavesi, and others, rely on to support their claims. In no case are those first person plurals the only manuscript readings; we are not forced to accept them.⁴⁵ The plurals are usually accepted because of the view that the *daimones* are immortal; we then find evidence of this in the plurals, and construct the "bits of love" account to square with that assumption. None of this is necessary.

So where does all this leave us? My conclusions are these: Love and Strife are part of the natural world; they are fundamental entities in Empedocles's theory of what there is. (I take that theory to include both the so-called "physical" and the so-called "religious" aspects of his theory.)⁴⁶ They are physical but not material, not stuffs. The texts of Empedocles do not require us to interpret them as stuffs, and more importantly, there are good reasons not to so interpret them. Moreover, and this is part of the larger project of the paper, there is no historical or conceptual impossibility in this interpretation. Greek thinkers before Plato were not "incapable of conceiving anything other than matter." In making such a claim, it is we who have failed to think correctly about them.⁴⁷

45. See Curd, "A New Empedocles," and Laks, "Reading the Readings."

46. I take it that the "how many poems" question is irrelevant to this claim.

47. This is a revised version of the talk I gave at the Catholic University of America in October 2007 as a part of the lecture series "Early Greek Philosophy: Reason at the Beginning of Philosophy." I am grateful to the department for inviting me and to the audience there for questions and suggestions; I learned a lot from them and had great fun in the discussions.

APPENDIX: A SHORT EXCURSUS ON SENSATION

Perception takes place through the roots. “By earth we see earth, by water, water; by air, wondrous air; yet again, by fire annihilating fire; love by love, and strife by destructive strife” (B109; see also Aristotle *De Anima* A.2.404b8–15 (the context for B109), and A86 for the testimony of Theophrastus). This could indicate that perception is reducible to the stuffs and hence is to be explained entirely corporeally. B109.3 is especially relevant here, as it asserts that it is by love that we see (ὀπώπαμεν) love, and by strife, strife. Thus, Love and Strife must have the same corporeal status as the roots.

Empedocles’s theory of perception deserves a much fuller treatment than is possible here.⁴⁸ There is no question that the mechanism of perception requires corporeal components. Perception is the effect of effluences from the roots in a sensible object (which is a mixture of the roots) on the perceiving individual (also a mixture of the roots). My seeing a red pomegranate depends on the effluences from the pomegranate entering commensurate pores in my eyes (A92 = Plato, *Meno* 76c4ff.). Yet, though I see red by, in some sense, the red in my eye (the same four ingredients that make up the pomegranate make up my eye), there is no commitment to the reality of red on a par with the roots (as there seems to be in Anaxagoras). Color is the effect of the combination of the roots, and so is the eye itself.⁴⁹ Thus, there is no question that it is through the

Dean Kurt Pritzl, OP and Professor Jean DeGroot were generous with help and hospitality before and during my visit. (I am only sorry I was not able to attend all the other sessions that term.) The presentation from which this paper grew is the first part of a larger project (in progress) of developing an account of divinity, thought, and intelligibility in the Presocratics. Working on the talk for the fall of 2007 and then revising the paper have helped me see even more clearly how complicated these issues are and how big a project I have undertaken. The presentation at CUA began as an attempt to respond to questions raised by Brad Inwood, who was the commentator on a paper on thought and intelligibility that I gave in Chicago the year before in 2006. His comments thus led me into the larger project on the problems of thinking about early Greek conceptions of stuffs and forces. Although I disagree with his views on this question, I always benefit from discussions with Brad Inwood: his intelligent and generous (though persistent) comments, questions, and disagreements have been an inspiration to me for many years. I have also discussed the project of which this paper is a part with several of my colleagues, and I am happy to acknowledge debts to Jeff Brower, Jan Cover, and Martin Curd. (Some of my views have changed since this paper was presented and revised for publication.)

48. A complete project on the question of corporeality in early Greek thought will require treatment of both thought and perception.

49. Ierodiakonou, “Empedocles on Colour,” is an excellent discussion of these issues.

agency of the roots that we perceive the roots, and Empedocles notes this by using dative constructions throughout B109. Yet the seeing that Empedocles has in mind in B109 seems to be more than a physiological process, for we have been assured by Empedocles that no mortal has seen Love. As Ierodiakonou points out, Aristotle quotes B109 in the context of a discussion of those who speak about understanding and perception, and he does not limit himself to just seeing. She concludes, “We do not therefore have to assume that B109 deals exclusively with vision, rather than perception quite generally, or some kind of awareness.”⁵⁰ Our awareness of Love and Strife as such is not the direct and unmediated result of effluences, but is rather a reasoned conclusion we reach through experience of their activities in us and the world. Our sensory awareness of color, on the other hand, is not a conclusion we draw, but a direct effect of the effluences.

Anaxagoras has a similar account of vision as the double production of the object seen and the eye. See DK 59A92, and Curd, *Anaxagoras*, 228–29.

50. Ierodiakonou, “Empedocles on Colour,” 29. It is important to note that Ierodiakonou’s discussion is not focused on the status of Love and Strife; yet she says of B109, “it would not make sense to talk about literal seeing in the case of Love and Strife” (29).

8 ∞ Anaxagoras

Science and Speculation in the Golden Age

I. INTRODUCTION

On February 17, 478 B.C., shortly before noon, the sky in Athens began to grow dark. The winter sun became dim and its bright disk narrowed to a crescent. Suddenly it went completely dark, except for a narrow ring of fire at the circumference. The eclipse could be seen clearly only in reflections from water or pinhole projections, but it was visible to those who looked. The people of Athens were witnessing a rare solar eclipse; this one an annular eclipse in which the sun is not completely obscured. Traditionally, such an event was understood as a dire portent from heaven and struck observers with foreboding. But a new spirit of discovery was in the air, ever since the philosopher Thales had allegedly predicted a solar eclipse that was seen in Asia Minor roughly a century earlier. The present eclipse in Athens would usher in a new era, because for the first time someone looking up at it understood what was happening.

There had been a number of ingenious explanations of eclipses advanced by philosophers in the century since Thales's "prediction," but none had even come close to a correct understanding. Now, a young refugee from Ionia, across the Aegean sea from Athens, had a hypothesis about what could make the sun grow dark in a solar eclipse, and what could make the moon grow dark in a lunar eclipse. Standing in the rubble of Athens—for the great city had recently been demolished by Persian invaders—he made calculations that confirmed his hypothesis. Then he went down to the port city of Piraeus day after day for weeks or months

and collected information from travelers and correspondents. When he was done, he knew he had made a first-rate discovery.

The young man with the hypothesis was Anaxagoras of Clazomenae, who at about twenty-two years of age worked out a problem that no one in the history of the world had ever solved, and he proved his hypothesis empirically, on the basis of his own observations and those of others—or so I will argue in the course of trying to explain the thought of this remarkable philosopher. Anaxagoras spent thirty years in Athens at the time of the Golden Age. His name became synonymous with esoteric knowledge, a kind of philosophical and scientific icon of his time, the nerdy intellectual, like Einstein today. But in the course of time, the book he wrote was lost, his theories were transmitted in a muddled form, and his contributions were obscured. The challenge in studying Anaxagoras, as in the case of most Presocratics, is to understand him in his historical context, and also to appreciate him as a thinker in a kind of timeless context as well, as someone with whom we might want to have a philosophical conversation.

The basic facts of Anaxagoras's life are these: He grew up in Clazomenae in Ionia; he spent thirty years in Athens, where he became renowned as a philosopher and a friend of the leading intellectuals of the city, most notably the great statesman Pericles. He then fled from an indictment and spent the remainder of his life in Lampsacus in northern Greece. There is a controversy over whether Anaxagoras was in Athens from about 480 to 450 B.C., or from about 460 to 430 B.C.¹ As my story about the eclipse indicates, I think it had to be the former, which agrees better with the reports we have of his life. His name is also firmly associated with a meteor that fell in northern Greece in 467, and his theories were known to the playwright Aeschylus, who mentioned them in plays written before 460. So without getting into the minutiae of his biography, I will assume that he spent the early years of his career in Athens.

1. Diogenes Laertius 2.7 = DK 59A1. For the earlier dates, Taylor, "On the Date of the Trial of Anaxagoras"; O'Brien, "The Relation of Anaxagoras and Empedocles"; Woodbury, "Anaxagoras and Athens"; for versions of the latter view, Mansfeld, "Chronology," who gives dates of 456/5–437/6 B.C., cf. Curd, *Anaxagoras*, 131; Sider, *The Fragments of Anaxagoras*, 6, gives the dates 464–434 B.C.

II. ANAXAGORAS AND THE PARMENIDEAN CHALLENGE

Anaxagoras belonged to the Ionian philosophical tradition, which focused on cosmology. How did the world arise, what was it made of, and what was the cause of natural phenomena? A series of philosophers, from Thales on, had addressed these questions and laid a kind of conceptual foundation for scientific inquiry. But there was one figure who had challenged this tradition: Parmenides of Elea, in southern Italy. He had argued that what-is cannot come to be, so we can ascribe to reality only timeless attributes. Anaxagoras evidently knew Parmenides's work. It is usually assumed that Anaxagoras, along with some contemporaries such as Empedocles and Leucippus, was desperately trying to save cosmology from Parmenides's devastating attack. Certainly he repeats and approves of Parmenides's dictum that nothing can come from what-is-not. But neither he nor Empedocles (nor, I think, Leucippus) ever disagreed with Parmenides on this fundamental point. Nor does Anaxagoras ever defend the possibility of cosmology against Parmenides's apparent rejection of the enterprise. Why not? How could Anaxagoras accept Parmenides's principles and ignore their implications for cosmology? Because Parmenides himself ignored those implications, or at least Anaxagoras thought he did. Remember that the last part of Parmenides's poem was the *Doxa*, or Opinion section, which was in fact an elaborate cosmology that in some sense applied his own principles. If one reads the *Alêtheia*, or Truth section, in light of the *Doxa*, or Opinion section, one sees the cosmology there as a new, improved version of what had been done poorly and unreflectively by earlier cosmologists. So Parmenides's challenge is not to abandon cosmology, but to put it on a theoretically sound basis. Now that may not be what Parmenides had in mind; modern commentators usually take the Opinion section as a kind of anti-cosmology intended to show the futility of the enterprise—and they may be right.² But the poem was new and difficult, and it may have struck the first generation of readers as offering a recipe for cosmology rather than a disavowal of it. And it does appear that Parmenides went to a lot more trouble to develop his cosmology than he needed to, if his object were merely to show how vain the project was. Perhaps he really did try to create a better cosmology, and if

2. E.g. KRS, 351; PSP, 316–17.

so, he succeeded both theoretically and empirically (as will be explained below). So brilliantly did he succeed, in fact, that the next generation of cosmologists used Parmenides's cosmology as a model and archetype.

In light of Parmenides's success, Anaxagoras must have felt justified in following Parmenides's recipe for a cosmology. We start from a question: given that nothing can come from what-is-not, what is the most economical way to account for the phenomena of the world? In his cosmology, Parmenides posits two changeless and self-identical realities, light and night. Other objects can arise from the mixture of these two realities, just as a cake can result from a mixture of eggs, milk, and flour when heat is applied. On this model, nothing *real* comes to be or perishes, but a set of real things gets rearranged to produce different phenomena. The phenomena come and go, but the real things are always present. Thus, we can account for all phenomena in terms of a set of basic realities that have Parmenidean properties: *they* do not come into being or perish, they are all alike, they do not change, and they have limits. But what are the basic entities?

Parmenides gets by with two: light and night, the former rare, hot, and light, the latter dense, cold, and heavy. There is, however, a potential problem with Parmenides's chemistry: when we mix together these two things, we get properties that seem different from any that the two basic elements possess. Parmenides's theory can explain how something can be of an intermediate density or hotness, but how can it explain something's being blue or salty? How do we explain the existence of something like flesh or blood? There seems to be an emergence of new properties, and perhaps even of substances, and this looks like a case of something's coming to be out of nothing.

To avoid problems of emergence, Anaxagoras proposes a theory in which everything that will ever appear in the world is already present in the beginning. Thus, present in the primeval chaos are not only the properties of rare and dense, hot and cold, light and heavy, etc. but also aether and earth, and everything else we can imagine. Well, not quite everything: Anaxagoras seems to account for all the materials and properties of the world, but not necessarily the natural kinds of discrete things, such as dogs, cats, and people, although he may have some provision for them, as will be mentioned later. But within the realm of properties and stuffs, he seems to recognize all of them as present. His is not an economical

ontology, but it does avoid emergence as far as possible. If a mist arises from the sea and forms a cloud, and the cloud becomes a thunderhead and spews a thunderbolt, Anaxagoras can say that the fiery content of the thunderbolt was already present in the sea. It just became concentrated in the meteorological process and eventually flashed out from the cloud. Nothing came to be in an absolute sense: the fire was there all along—it just became *manifest* to the senses in the final stage of the process. Here then is cosmology (and meteorology) without coming-to-be.

In order to account for phenomena like these, Anaxagoras develops four principles. They are:

- NB** No Becoming: Nothing (no basic entity) comes to be or perishes.
- UM** Universal Mixture: Everything is in everything, i.e., every phenomenal object contains every real entity.
- QP** Quantitative Predominance: That entity which is most plentiful in a phenomenal object imparts its character to the whole.
- ID** Infinite divisibility: Every phenomenal object is infinitely divisible.³

NB comes from Parmenides and sets the requirements that the other conditions must fulfill. **UM** ensures that any object has all elements in it. **QP** tells us how one of the elements comes to manifest itself to the senses. **ID** is necessary because if there were some smallest parts, there would be some stretches of matter than could not include all the elements. But if there are no smallest parts, then no matter how small the sample, there can always be a smaller portion of any entity in it. On this model, concentrations of entities can change, but no area is devoid of any entity, or alternatively, no entity can be fully extracted from any phenomenal substance.

Anaxagoras conceives of the world as a big mixture of all the elements. In the primeval chaos, nothing is distinct from anything else; each thing is completely and utterly mixed with everything else. But there is a mechanism for separating things out that makes different kinds of things group together in different places, and through this mechanism, differ-

3. See Kerferd, "Anaxagoras and the Concept of Matter," and Graham, "Postulates of Anaxagoras."

ent phenomenal substances emerge: earth here, water there, air there, fire there. But however much different phenomenal substances emerge, it remains true that everything is everywhere in the world. Thus, a stretch of water does not just contain water: it contains earth, air, fire, and everything other element. Anaxagoras holds that while concentrations of elements change, trace amounts of everything are always present, and he needs to say this because he must leave open the possibility that some types of change will occur such that the water, for example, will dry out, or become muddy, or salty. He does not want to allow the possibility that some substance can appear out of nothing, so he stipulates that there is always something of everything everywhere.

Furthermore, if, say, water appears somewhere it was not before, the change involved will not be a pure genesis, that is, a coming to exist. The water already existed. The change in question will just be an increased concentration that makes the previously latent water manifest to the senses. The change is a minimal kind of change. Thus, with Anaxagoras we have a very lavish ontology in which almost every kind of phenomenal substance we can recognize is an element—not only are earth, water, air, and fire elements, as they are for Empedocles, but also wood, flesh, hair, gold, iron, etc. It is possible that he thinks of qualities as substance-like too: hot and cold, wet and dry, light and heavy, hard and soft may be substance-like entities that are mixed with all the other things. Anaxagoras is willing to multiply entities in order to forestall radical change, since if every entity is everywhere, then change is a mere redistribution of quantity. Water, just like every other element, becomes concentrated in certain areas and diluted in others. Nothing comes from what-is-not, so that **NB** is preserved. Indeed, **UM**, **QP**, and **ID** are principles that serve to maintain **NB**.

Previously I said that every kind of phenomenal substance is an element, but that can't be quite right because every phenomenal substance is a mixture of everything, and an element must be simple. We must, then, make a distinction between, say, the wood in a desk and elemental wood. Corresponding to every phenomenal stuff that we recognize, there is an elemental reality. On Anaxagoras's theory, however, the element is never actually found in its simple state, for it is always mixed with other things. Thus, there seems to be a practical problem about identifying elements. Moreover, there also seems to be a theoretical problem: if *A* is composed

of A and B and C, how can we say that we have analyzed A, if A is still on the right side of the equation? Anaxagoras has, I think, a simple answer to both questions: elemental A is a theoretically pure version of phenomenal A, and if you want to know what pure A would be, it is just like that (pointing to A). There is no need to behold a completely pure version of A, because phenomenal A is just the manifestation of elemental A, having all its properties and no others. While phenomenal A contains B to Z, *they* do not manifest themselves, and we may ignore them in our sensory acquaintance with A. To put it another way: whereas we usually analyze a compound to isolate its previously mysterious elements, here the elements are not mysterious at all. They are just the phenomenal stuff conceived of as unmixed.⁴

So, according to Anaxagoras, there are many basic realities, or elements. It is often said that he has an infinite number of them.⁵ What he says is that in the primeval chaos they were boundless in quantity and in smallness. The word for “boundless,” *apeiros*, can mean “infinite,” but at this early time, it is not obviously so precise, and he may only mean to say that there is an indeterminately large number of them. According to his axioms, all elements mix together everywhere such that the predominant element (or elements) determines the character of the whole.

III. MIND AND COSMOGONY

There is, however, one other entity besides the elements, which we have not discussed. It is Mind (*Nous*), which has its own rules of engagement. It is finer than any element. It does not mix with the elements, for if it did, it would lose its purity and power. But it does somehow enter into some phenomenal substances, notably into living things. Thus Anaxagoras presents us with an ontological divide between mind and matter. Earlier philosophers had had some conception of soul as the source of life and mind as the intellectual aspect of soul. But no one before Anaxagoras had obviously treated mind as a reality in its own right, something substantial. Anaxagoras does present mind as a distinct reality with its own nature and behavior. His mind is not immaterial, for it dif-

4. See Graham, “Was Anaxagoras a Reductionist?”

5. E.g. KRS, 378.

fers from other realities more in degree than in kind. It is finer than the elements, but still material; it has location, though it is not everywhere; it interacts with the elements, but not promiscuously, nor on equal terms. He wants mind to have power over matter, even if it is not fully distinct from matter.

Part of almost every Presocratic cosmology is a cosmogony, an account of how the world in which we live came into existence. Since Anaximander, philosophers had started from some sort of primeval state and explained how things had changed so as to produce the kind of world we experience, with an earth, a sun, moon, stars, clouds, weather phenomena, animals, and plants. In Anaxagoras's cosmogony, mind plays a special role. Initially, things were all mixed together in such a way that nothing was distinct. Mind then began a rotational motion, which produced a great whirlpool of matter. The action of this whirlpool or vortex caused the elements to separate out into stretches of earth, water, air, and so on, with earth at the center. Some material gathered together in the surrounding whirl to produce heavenly bodies. At this point, the vortex acted as a giant centrifuge in which things were separated out by their density. But however mechanical the later stages of the process might have been, the process started with a push from Mind, a kind of cosmic agent or first efficient cause. Thus not only does mind account for the autonomy of living things, but it somehow rules in the universe. Anaxagoras goes so far as to say that mind knows everything past, present, and future, and it acts so as to bring about certain future states of affairs.⁶

This is the beginning of a teleological account of the world, which Plato and Aristotle so prized. Yet both Plato and Aristotle were disappointed with Anaxagoras's account after the initial push, and when they looked for an account of why the cosmic mind had acted so as to produce this or that state of affairs, they found nothing, or hardly anything.⁷ Since we do not have the body of Anaxagoras's cosmogony, we have to accept his readers' assessment. Apparently, he makes only a general claim about the competence of mind and then goes on with telling how matter behaves in its own right. He provides a glimpse of teleology but does not exploit it to account for the present state of the world.

6. See Leshner, "Mind's Knowledge."

7. Plato, *Phaedo* 97b–98c; Aristotle, *Metaphysics* A.3.984b8–22 and A.4.985a10–21.

Anaxagoras envisages a flat earth, held in place by a cosmic vortex motion that keeps massy heavenly bodies aloft. If the vortex were to fail, the stars would fall from the sky. But the vortex will not fail. In fact, it is expanding its reach outward to the farther reaches of the universe. The stony heavenly bodies stay in motion, although it is possible that sometimes, owing to collisions or some celestial turbulence, some bodies can fall from their place aloft to the earth. And this, as we shall see, is one place where Anaxagoras's theory meets experience. Before Anaxagoras, all philosophers seem to have viewed the heavenly bodies as made up of fire and/or air and/or mist or cloud. Thus they were light bodies of the sort that float in the atmosphere. But Anaxagoras's bodies are earthy or stony and they need the centrifugal force of the cosmic whirlwind to keep them aloft. Why the sudden shift from lighter-than-air to heavier-than-air bodies?

To answer this question, let us return to Anaxagoras's immediate predecessor, Parmenides. Today Parmenides is most famous for his criticisms of cosmology. But it appears that in the first generation after he published his book, he was equally famous for his own "deceptive" cosmology, in which he produced at least three remarkable astronomical insights: the first was to say that the morning star was the evening star. The morning star appeared before the rising sun and the evening star with the setting of the sun. Today we understand these as appearances of the planet Venus at different stages of its orbit. The Babylonians knew about this identity more than a millennium before Parmenides, but apparently no Greek philosopher learned it from them. The second insight was to say that the moon gets its light from the sun. Today this is common knowledge. But before Parmenides no one in Greece, or for that matter Babylonia or Egypt or India or China, any of the scientifically advanced civilizations, had ever made this connection. The third insight was to say that the earth was a spherical body. Before Parmenides and for some time after him, almost every philosopher viewed the earth as a flat disk or plate, or perhaps an extended plane. Parmenides alone viewed it as a sphere, and within a little more than a century Aristotle would provide astronomical proof of this conjecture. The other great civilizations had no clue of this truth until long after the Greek discovery. The Greeks, on the other hand, came to accept the new view, and even measured the circumference of the earth with tolerable accuracy in the century after Aristotle.

Now it was the second insight that would make a significant difference for Anaxagoras's cosmology.⁸ He agreed with Parmenides that the moon gets its light from the sun. Once you hear this account, you can easily verify it. All you have to do is to watch the phases of the moon for a month as they change, in connection with the position of the moon relative to the sun. When the moon is 180° from the sun, it is full; when it is near the sun, it disappears as it is covered in shadow. When it is 90° from the setting sun, it is a half moon facing the sun on the right (west); when it is 90° from the rising sun, it is a half moon facing the sun on the left (east). The phases are correlated with the position of the moon relative to the sun, and that is all that is needed to account for the observed changes of the moon.

But when you know that, you know other things too. In the first place, you know that the moon must be spherical, or approximately so. For it is only a sphere that will produce shadows of the right shape for the phases of the moon. A flat body would produce only a gray or a white circle depending on the angle. Heraclitus's bowls would in fact produce the wrong shapes to the eye.

Furthermore, Xenophanes and Heraclitus both held (though for different reasons) that the sun is new every day. But when the moon is full, it shines all night long; if the sun illuminates the moon, then the sun must still be shining too. It does not disappear or go out, but it continues in existence, and we can even infer its position by reference to the moon. We thus know that it is going under the earth, that is, under the horizon, and circling around below earth from its point of setting in the west to its point of rising in the east. One further point is that, once we recognize the sun as the cause of the moon's light, we can infer the position of the moon relative to the sun. The moon must lie below the sun and nearer the earth because it is engulfed in shadow at the new moon. If the moon were higher than the sun, it would have phases, but it would never grow completely dark; it would be full at both the middle of the month and the end of the lunar month.

There is another possible inference to be made: If the moon loses its light, it must do so because something is blocking the sun's light to it,

8. Anaxagoras continued to believe in a flat earth; see Aristotle, *On the Heavens* 293b33–294a4, Martianus Capella 6.590, 592. We do not know if he had anything to say about Venus.

since it borrows its light from the sun. So if we understand a lunar eclipse as a loss of light, it now seems obvious that the eclipse is caused by some body blocking the sun's light. The largest heavenly body, according to Anaxagoras, is the earth. So a lunar eclipse is plausibly understood to be caused by the interposition of the earth between the sun and moon. Less obvious is the cause of solar eclipses. But by parity of reasoning, a solar eclipse could in principle be caused by the interposition of a body between the earth and the sun. Now the moon, we know, is below the sun. So it could in principle block the sun's light. But of course if the new theory of the moon as a dark, solid body, is correct, then at the end of every lunar month and the beginning of the next, the moon is lurking near the sun. We can see by observing both bodies when they are in the sky together that they are roughly the same size. So the moon could, in principle, obscure the sun. On this model, a solar eclipse could happen only between lunar months.

A lunar eclipse, by contrast, could happen only in the middle of a lunar month, at the time of the full moon. At that time the sun is on the far side of the earth from the moon and the earth could in principle block its light. Thus the theory of eclipses becomes a kind of problem of geometry, once we recognize that the moon gets its light from the sun. And indeed, this is the theory that Anaxagoras held about lunar and solar eclipses. Lest you think it trivial, let me point out that the theory of eclipses follows from the theory of the moon's light only with some further assumptions and a bold leap of imagination. Parmenides apparently did not make the connection himself. But Anaxagoras and his slightly younger contemporary Empedocles did. This is a piece of scientific progress that is unique to the Greek tradition. Greek scientists would teach it to the Babylonians and Egyptians, and not vice versa.⁹

Let us now return to the eclipse of 478 B.C. Having observed the eclipse, Anaxagoras could verify several points of his theory. His theory predicted that a solar eclipse would occur during the time of the new moon at the beginning of a Greek lunar month. And it did. His theory predicted that the moon would cover the sun, causing an occultation. He could see a circular disk blocking the sun, which would eventually cover

9. See Wöhrlé, "Wer entdeckte die Quelle des Mondlichts?"; Panchenko, "Eudemos Fr. 145 Wehrli and the Ancient Theories of Lunar Light"; Graham, "La lumière."

all but the periphery of the radiant body. Since the moon appears about the same size as the sun, it is the only body that could cause the occultation. Furthermore, he could *see* that the sun was larger, for the moon failed to block the periphery of the sun. It might be several times larger, based on the laws of perspective, which Anaxagoras had studied. But in any case, it was certainly larger. Thus he could confirm his theory in several respects and also make judgments of the relative sizes of the heavenly bodies which are apparently almost identical in their diameters as seen from earth.

Now let's look at a report of Anaxagoras's astronomy from the Christian bishop Hippolytus:

The sun and moon and all the heavenly bodies are fiery stones carried around by the revolution of the aether. . . . The moon is below the sun and nearer to us. (8) The sun exceeds the Peloponnesus in size. The moon does not have its own light, but gets it from the sun. The revolution of the stars carries them under the earth. (9) The moon is eclipsed when the earth blocks it, or sometimes one of the bodies below the moon; the sun is eclipsed when the moon blocks it at the time of the new moon. The sun and the moon make their turnings when they are deflected by the air. The moon makes frequent turnings because it cannot overcome the cold. (10) He first correctly explained eclipses and illuminations. He said the moon was earthy and had in it plains, <mountains> and valleys. (*Refutation of All Heresies* I.8.6–10 = A42)

All the features that follow from Parmenides's insight are present here. There is, however, one feature that seems oddly specific. Why does Anaxagoras say the sun is larger than the Peloponnesus, referring to the large peninsula that forms southern Greece? Why pick out a geographical formation on the earth?

There were two eclipses that were visible in Greece during the maturity of Anaxagoras, that of 478 and that of 463 B.C. Their paths can be reconstructed by running the clock backwards with a computer program (which must also adjust for the gradual slowing down of the earth's rotation and the gradual increase of the moon's orbit). The eclipse of 478 went right over the Peloponnesus (and Athens as well), whereas the eclipse of 463 covered only northern Greece. According to Anaxagoras's theory, the eclipse cast a shadow on the earth. Indeed, we can even read of this point in the poetry of his contemporary Empedocles:

It [the moon] did away with [the sun's] rays
to the earth from above, and it obscured the earth
as much as the width of the bright-eyed moon. (B42)

In other words, the width of the shadow cast on earth is equal to the size of the moon's diameter. If the moon were close to the earth and the sun far away, the size of the moon's shadow would approximate the moon's area. Of course in reality the moon is 250,000 miles away, and its shadow forms a cone that narrows considerably, leaving an umbra much smaller than the moon. But with appropriate assumptions the inference makes sense. If Anaxagoras shared Empedocles's view, he could go down to the port of Piraeus and question the travelers who had put in and sent queries to star-gazers in the region. That is, Anaxagoras could have simply engaged in a very ordinary kind of inquiry the Ionians called *historiê*. Where did you come from? Did you see the eclipse? Was the sun completely blocked out? By doing this in a busy seaport and corresponding with other stargazers, he could find out that the eclipse was visible all over the Peloponnesus, but only partially visible in northern Greece. The footprint of the moon covered the Peloponnesus and Attica, but not much else in mainland Greece. Had Anaxagoras been in his home city of Clazomenae, he would have seen the eclipse also, but he could not have inquired of travelers from the Peloponnesus, for there was a war going on. Athenian warships had recently liberated the coasts of Ionia and were attacking and pillaging the Persian-held territory in the vicinity in retaliation for the invasion of Greece. There was no regular communication across the Aegean. Anaxagoras could have made inquiries from Clazomenae, but his point of reference would have to be Ionia or some landmarks of the eastern Aegean. His actual point of reference indicates both when and where he made his observations. Incidentally, we have an even more precise account of his comparison than the one Hippolytus gives us. According to Plutarch, "Anaxagoras [says that the moon] is as large as the Peloponnesus" (*The Face in the Moon* 932a = A2). Thus the moon is the size of the Peloponnesus, the sun larger.¹⁰

This is not the only spectacular observation connected with Anaxagoras. About the year 467 B.C., a fiery meteor descended over northern Greece in broad daylight and crashed to earth near Aegospotami. It was

10. See Graham and Hintz, "Anaxagoras and the Solar Eclipse."

an object of wonder and became a tourist attraction for at least five hundred years. The remaining rock was about the size of a wagon and blackish in hue. It immediately became associated with the name of Anaxagoras. It was said that he had predicted the fall of the meteor. According to Pliny it fell about the time a comet was seen in the sky.¹¹ Now it is impossible to predict a meteor. But it is possible that the report is a garbled account of a theory that predicted the possibility of meteors. In any case, what is remarkable about the stone of Aegospotami is that it seems never to have been associated with a mythological event. Zeus or some Olympian deity did not launch the boulder. Apparently Anaxagoras's theories were well enough known to cause Greeks in distant places to think of them when unusual phenomena occurred. It was a spectacular confirmation of a scientific theory about the heavens. Here in fact is a case of an empirical fact becoming part of the background against which theories were evaluated. The stone of Aegospotami comes up in later theories; for instance, Diogenes of Apollonia cited it in his account of heavenly bodies, which he says are "like pumice stones," that is, like volcanic rocks.¹² Whereas earlier theorists could be said to have speculated about the constitution of heavenly bodies without evidence, Anaxagoras and his followers could claim, with some justification, to have a piece of celestial material from which to construct their theories. If early Greek cosmological theories were weak in empirical content, the theorists could be opportunistic in finding evidence for them and testing them against whatever data they had at their disposal.

There is another one of Anaxagoras's scientific theories worth mentioning: two earlier thinkers had offered explanations of the Nile floods in Egypt. Every summer, about the time of the summer solstice, the Nile would flood. This was a strange phenomenon to the Greeks, because they were used to rivers flooding in the winter or early spring, when rainstorms are frequent and melting snows fill the rivers to overflowing. In these cases, the cause of flooding was obvious. Why would the Nile flood in the midst of the burning heat of an African summer? Thales had said the floods were caused by the etesian winds, the strong northern winds that started blowing about the same time, which caused the river wa-

11. Pliny, *Natural History* 2.149–50 = DK 46A11; Plutarch, *Lysander* 12.1–2 = DK 46A12.

12. Aëtius II.13.5 = DK 51A12.

ters to back up. Hecataeus said waters flowing from the ocean in the far south filled the Nile. Anaxagoras proposed a unique account. The Nile must be fed by snows in high mountains. When the sun melts the snows, they fill the river and cause it to flood. This theory became fashionable among the literary elite in Athens. It is mentioned in several places by the playwright Aeschylus, as well as by the later playwrights Sophocles and Euripides. Herodotus considers this theory beside those of Thales and Hecataeus.¹³ In fact, the Nile *is* fed by melting snows from high mountains in southern Africa, but that is not what causes it to flood, but rather monsoon rains in the Ethiopian highlands. In any case, the theory shows the range of Anaxagoras's interests, and also the extent of his influence. Aeschylus mentions his theory in plays written before 460,¹⁴ and Herodotus seems to have known of it when he was traveling up the Nile in his youth. Herodotus criticizes the view as absurd, given the heat of the African desert. In any case, clearly Anaxagoras's theories were among the most discussed theories of the fifth century and were well-known to the Athenian and Ionian intelligentsia.

IV. THE ANAXAGOREAN LEGACY

Anaxagoras's thought grew out of the debate about reality and nature that goes back to the sixth century and takes on new urgency with Parmenides's criticisms. Clearly, Anaxagoras was a pluralist in the nascent field of metaphysics: he believed in a plurality of real beings, and indeed, in an indefinitely large number of elemental stuffs. In another sense, he prefigures later dualisms in which mind is opposed to matter as a fundamentally different kind of thing. But Anaxagoras is not yet a dualist, and his Mind seems to be a special kind of matter that is autonomous and independent in its operations. His account of interactions between elements is one of mixture, whereby every element is present in any stretch of the actual mixture that constitutes the world, just as it was present in the primeval chaos before the ordered world emerged.

Anaxagoras's theory of matter was destined to be superseded by another theory proposed during his lifetime, that of atoms and the void

13. Herodotus, *History* II, 20–22.

14. Aeschylus fr. 300 N, *Suppliants* 497, 561.

proposed by Leucippus. Matter, it turns out, is not continuous, but consists of small particles of matter (or is it energy?) surrounded by empty space. Anaxagoras's chemical theory was destined to be superseded by another theory, also proposed during his lifetime, that in which elements in whole number ratios combine to produce compounds with properties different from those of the elements. This theory was proposed by Empedocles, who recognized only four elements: earth, water, air, and fire. Today we know that none of Empedocles's elements is a simple substance, but we also know that there are ninety-two stable elements which combine to yield an unlimited number of compounds. We must recognize that, in the early fifth century B.C., these three theories were initial answers to the question of how a cosmos could arise from chaos, but none of them had any experimental evidence in its favor. As we know, the theory of chemical elements was not established until the nineteenth century, and the atomic theory was not actually proved scientifically until the early twentieth century. Yet it is interesting that modern science was still working with theories proposed by Greek philosophers twenty-plus centuries earlier. Not surprisingly given their curiosity, the Presocratic philosophers had explored a wide array of theories of matter well before instruments and methods were available to test them.

This situation of theoretical proficiency combined with observational ineptitude leads most scholars of early Greek philosophy to conclude that the Presocratics were incapable of making contributions to science. In effect, they echo the words of one of the earliest modern prophets of science, Francis Bacon:

That wisdom which we have derived principally from the Greeks is but like the boyhood of knowledge, and it has the characteristic property of boys: it can talk, but it cannot generate; for it is fruitful of controversies but barren of works. (*The Great Instauration*, Preface)

It is the almost universal judgment of scholars that the Presocratic philosophers developed a scientific conception of the world, but without making any real contributions to science itself. In the case of astronomy, however, I must beg to differ with the judgment of history. The insight Parmenides had about the source of the moon's light quickly bore fruit in the form of multiple explanations of relationships among the heavenly bodies. In particular, Anaxagoras derived from Parmenides hypotheses about the heav-

enly bodies which he actually tested and verified. After Parmenides, Anaxagoras, and Empedocles accepted Parmenides's account of the moon's light, no other new hypothesis was subsequently offered by any Greek philosopher. It was so evidently true that it has been accepted from Anaxagoras's time down to the present day.

Furthermore, Anaxagoras's account of eclipses was brilliant and correct. Anaxagoras seems to have tested his theory in measuring the shadow the moon left on Greece by the eclipse of 478 B.C. Empedocles accepted this theory, and again no new theory of eclipses was offered. In the fourth century B.C., Aristotle cites Anaxagoras's theory (without mentioning who its author was) as a paradigm of scientific problem solving.¹⁵ It has remained the sole viable theory of eclipses from the fifth century B.C. until the present. This kind of theoretical and observational success is what we are wont to call a scientific discovery, and I think we should recognize Anaxagoras (along with Parmenides, of all people) as one of the founders of scientific astronomy. Astronomy subsequently became part of the *quadrivium*, the fourfold scientific component of the seven liberal arts recognized in Greek education. It became, as is generally recognized, the first empirical science, and it was put on the secure path of a science not by Plato or Eudoxus, but by Parmenides and Anaxagoras. If that is so, early Greek philosophy was not barren of works, but amazingly fruitful.

Scientific philosophy began with two eclipses: that of 585 B.C., which Thales allegedly predicted and thereby drew attention to the new way of thinking, and that of 478 B.C., which, I have argued, Anaxagoras used to test a new and correct theory of eclipses. Let us now go to another eclipse, a lunar eclipse that took place during World War I. In the desert of Arabia a young British army officer took out his almanac and noted the event, scientifically predicted for July 4, 1917. When the Turkish troops at an enemy outpost ran outside and desperately beat on pans to drive off the evil spirit devouring the moon, his Arab fighters ambushed them and captured their outpost.¹⁶ The British officer was T. E. Lawrence, whom history knows as Lawrence of Arabia. It is one of the great ironies of history that the land that produced both Thales and Anaxagoras had so completely forgotten their accomplishments.

15. Aristotle, *Posterior Analytics* B.1, 2, and 8.

16. *The Seven Pillars of Wisdom*, ch. 54.

Less than two years later, in 1919, the almanacs predicted a solar eclipse that would be visible only near the equator, on May 29. Sir Arthur Eddington led a British expedition to Principe Island while another team went to Sobral, Brazil, to study the eclipse, but not because there was anything particularly novel about the event itself. Rather, the scientists went to test a new scientific hypothesis that said the sun's mass could distort the fabric of space and time and hence bend the light from a star behind the sun. During the eclipse light from stars near the sun's position would become visible. Eddington went and got his confirmation. In a conference of the Royal Society held on November 6, 1919, Eddington announced the results of his observations. The light from a star behind the sun had been deflected. Newton was out; a little-known physicist from Berlin had rewritten science. The next day the headlines in London trumpeted the name of Albert Einstein. And once more an eclipse marked the dawn of a new era of knowledge.

9 ∞ Bacon's Third Sailing

The "Presocratic" Origins of Modern Philosophy

I. INTRODUCTION

Notwithstanding his legendary interpretations of Aristotle and his protracted engagement with Plato, Heidegger was not in any obvious sense of the word a dialectical thinker. His philosophizing does not typically proceed, zigzag fashion, in an ascent from and descent back to that which Socrates and his successors regarded as first for us, philosophers and non-philosophers alike, namely, the twilight world of common or reputable opinion. From the heights or depths of the *Seinsfrage*, in truth, the starting point of classical dialectic is hard to distinguish from *Uneigentlichkeit*, *das Gerede*, and *das Verfallen des Daseins*. And yet the philosopher from the Black Forest would never have risen to the public prominence that was his for so much of his career had he not managed on occasion to speak not only about, but also to everyday human cares and conceits. Consider his preoccupation, especially visible in his later years, with "the question concerning technology." What greater proof could there be of the relevance of his philosophy to common life? Admittedly, there is nothing in the least common-sensical about his tracing of the origin of the modern technological state to the metaphysics of Plato and Aristotle, or his appeal to the Presocratics for help in facing up to its dangers. But then we cannot reasonably expect a philosopher, no matter how respectable or commonplace his point of departure, simply to endorse the common point of view.

I gratefully acknowledge my debt to the Earhart Foundation for its generous financial support of my work.

Heidegger's interest in Greek philosophy amply attests, in any case, to his need for philosophical interlocutors. Hence the extensive use he makes of the literary form of the commentary, virtually unrivalled by any other modern philosopher of the first rank. Especially notable in this regard are the efforts Heidegger expended upon exegesis of the earliest of the Greek thinkers. For while there is undoubtedly matter enough in their notoriously fragmentary literary remains to occupy philologists and historians for generations to come, a reader might well wonder how a thinker of his stature could have hoped to find in such shards anything of philosophical worth equal to the great many pages he lavished upon them. Not that his attention to the Presocratics is entirely without modern precedent. In writing a history of philosophy from the standpoint of his absolute spirit, Hegel was clearly bound to consider them. And even if Nietzsche shared almost nothing of Hegel's progressivism, he maintained an interest in the birth and first growth of Greek philosophy long after he abandoned his Basel professorship in classical philology. Still, it is difficult to think of another modern thinker for whom the Presocratics hold such philosophical promise as they do for the author of *Being and Time*. That the name of Francis Bacon might plausibly be advanced in this context is more than a little ironic. For of course in Bacon, technology—or as he would have it, the scientific domination of nature for “the relief of man's estate”¹—finds not merely an eloquent herald and apologist, but also, if we are to take him at his word, its philosophical founder.

Evidence of Bacon's interest in early Greek thinking is not hard to come by. Allusions to, anecdotes about, paraphrase or quotations from, and exposition and analysis of various Presocratic philosophers turn up in almost all of his writings, published or unpublished, from all periods of his career. And although a few figures earn the lion's share of his attention, an impressive number would merit multiple entries in a complete index of Bacon's works, with not only Democritus, Heraclitus, and Parmenides, but also Anaxagoras, Anaximenes, Empedocles, Leucippus, Philolaus, Pythagoras, Thales, and Xenophanes all making re-

1. *The Advancement of Learning* (henceforth *AL*), edited by Michael Kiernan, *The Oxford Francis Bacon* (henceforth *OFB*), vol. IV, 32. For Baconian writings not yet available in the *OFB* edition, references will be to Spedding, Ellis, and Heath's *The Works of Francis Bacon* (henceforth *SEH*). I have occasionally modified the translations of Bacon's Latin writings appearing on the facing page of *OFB* volumes, as also of the translations in the *SEH* edition, for which I also provide the appropriate volume and page references.

peat appearances.² To be sure, considerations such as these assuredly do not suffice to show that Presocratic philosophy made a deep or a lasting impression upon Bacon. His contemporaries valued erudition in a writer far more highly than do we, after all; and even by their standards he was exceptionally learned. One of his modern editors, unimpressed by the astonishing array of ancient literary sources Bacon draws upon, calls him the “most magpie of readers.”³ The description is consistent, it would seem, with Bacon’s frank admission that one of the principal uses of “studies” is to provide “ornament” for one’s discourse, as also with his practice of collecting pithy sayings in order to “sprinkle” wherever he willed the “salt” he “extracted from them.”⁴ A case in point is the Heraclitean dictum “a dry soul is wisest and best” (DK 21B118), which crops up again and again throughout Baconian writings, although at no point in function of an interpretation of the philosopher who coined it.⁵ Indeed, Bacon never attempts a commentary upon a single philosophical predecessor, Presocratic or otherwise, despite making various forays into scriptural exegesis and penning an entire volume of allegorical interpretations of Greek and Roman fables.⁶ If he repairs to the texts of the earli-

2. To my knowledge, of those to whom KRS devote at least a partial chapter, Anaximander, Eurytus of Croton, Melissus, and Diogenes of Apollonia are the only Presocratic thinkers whom Bacon never mentions by name. If I am not mistaken, the only other Presocratic of any consequence absent from his writings is Zeno; a Zeno is mentioned in *Novum organum* I §71, *The Instauration magna Part II: Novum organum and Associated Texts* (hereafter *NO*), edited by Graham Rees, *OFB* vol. XI, 112; but there Bacon almost certainly has in mind the founder of Stoicism, and not his Eleatic namesake. Bacon also refers with some frequency to Homer, Hesiod, Herodotus, Hippocrates, and to various sophists, but what if any contribution such “Presocratics” make to his philosophy will not concern me in this essay.

3. Michael Kiernan, “Introduction,” *AL*, lxxxv. For a similar assessment, see Graham Rees, “Introduction,” *Philosophical Studies, c.1611–c.1619*, *OFB* vol. VI, xxxvii. Kiernan does greater justice to his author in the “Introduction” to his edition of *The Essayes or Counsels, Civill and Morall Essays* (hereafter *Essays*), *OFB* vol. XV, xliii, where, borrowing John Dryden’s appraisal of Ben Jonson, he says that Bacon “invaded authors like a monarch.”

4. *Essays*, 152; “Preface,” *Apothegms New and Old* (hereafter *Apothegms*), SEH VII, 123. See also *AL* II, 72–73; *De dignitate et augmentis scientiarum* (hereafter *DAS*), II c. 12, SEH I, 516–17/IV, 314.

5. *AL* I, 8 and II, 107; *Essays*, 84–85; *De sapientia veterum* (hereafter *DSV*) c. 27, SEH VI, 677/754; *NO* I §49, 86 and II §32, 306; *DAS* V c. 1, 616/407; *Apothegms*, 163.

6. The “myths of the poets” are most extensively treated in *DSV*, though Bacon enlarges upon his interpretations of particular ones in *DAS*. Scriptural citations are ubiquitous throughout his writings, but in *DAS* VIII c. 2, 750–69/V, 36–56 he expatiates at some length on the book of Proverbs. In a telling contrast, he devotes all of one paragraph to a consideration of the value of “interpretation and explication of authors, commentaries, scholia, *spicilegia*, and the like” (*DAS* VI c. 4, 709/494).

est philosophers, it clearly is not because he is eager to understand them on their own terms and for their own sake.

A more telling gauge of Bacon's interest in early Greek thought is to be found in *Of the Proficiency and Advancement of Learning* (of 1605), the second part of which inventories the principal deficiencies, as Bacon sees them, in the present store of human knowledge. Among his desiderata is a "collection to be made painfully and understandingly *de Antiquis Philosophiis*"—a piece of Aristotelian idiom for the Presocratics, as the context makes clear—"out of all the possible light which remaineth to us of them." Some eighteen years later, he repeats the same wish in the greatly expanded Latin version of the same work, the *De dignitate et augmentis scientiarum*. And while he plainly had no intention of shouldering the editorial burdens involved in the compilation of the "Calendar of Sects of Philosophie" that he calls for, he does insist in both works on the "diligence and care" that he has exercised in tracking down the least "echo (*auram*)" of the "ancient philosophers."⁷ Had a comprehensive, accurate, and well-organized edition of the remnants of and early witnesses to early Greek philosophy appeared in his lifetime, Bacon would undoubtedly have been one of its most devoted readers.

Yet not even Diels and Kranz would have made him sanguine about the prospects for retrieving an adequate understanding of the Presocratic philosophers on their own terms. In the first place, and as we shall see in greater detail momentarily, he was far from confident about the impartiality and therewith the reliability of those post-Socratic witnesses on whom we are necessarily dependent for the transmission of the legacy of early Greek thought. Still more problematic, in his judgment, is the fact that it is only the *disiecta membra* of the original works that have come down to us,⁸ since "it is the harmony of a Philosophy in itself, which

7. *AL* II, 92; *DAS* III c. 4, 563–64/ 358–59 together with *DAS* II c. 4, 502–4/ 300–301. Bacon's list of documentary sources for the study of the texts and teachings of the Presocratics undergoes both amplification and excision over the years. In *AL*, published in 1605, only Plutarch is named, whereas in the parallel passage in *DAS*, published in 1623, Bacon mentions "the citations of Plato, the confutations of Aristotle, and the scattered notices which we have in other books, both ecclesiastical and heathen (Lactantius, Philo, Philostratus, and the rest)." In two unpublished writings, *Cogitata et visa* (hereafter *CV*) and *Redargutio philosophiarum* (hereafter *RP*), dating from around 1607–1608, he also identifies Cicero, Diogenes Laërtius, and Lucretius (*SEH* III, 569–70 and 602). Differences between these several lists attests, perhaps, to his "diligence and care" in tracking down sources.

8. Making of this necessity an opportunity for the exercise of his virtue, he sometimes acts

giveth it light and credence.” Consequently, the “singled and broken” remains of individual Presocratic texts, especially when “fagotted up together” by later editors, must render the thinking that animated the original works “foreign and dissonant” to us, if not downright “monstrous and incredible.”⁹ On the other hand, the hermeneutical priority of the whole to the part, here vigorously affirmed by Bacon, also affords us a rule for discerning both the reason for his interest in the relics of Presocratic philosophizing and the terms of his most considered judgment about them: it is only on the way to and in light of an understanding of his philosophy as a whole that we could we hope to grasp the sense and significance of his engagement with early Greek philosophy. We should therefore resist the temptation to dismiss Bacon’s displays of his classical learning as stylistic flourishes merely, proof of a bird-like attraction to literary tinsel. What Harold Cherniss says of Aristotle’s account of the Presocratics suits Bacon’s just as well: “There are no ‘doxographical’ accounts in the works of Aristotle, because Aristotle was not a doxographer. . . . For him—as for every philosopher—the doctrines of his predecessors were materials to be remoulded” for his own philosophical “purposes.”¹⁰

II. THE ARGUMENT FROM AUTHORITY AGAINST “THE PHILOSOPHER’S” AUTHORITY

Setting aside for the time being what seem to be merely occasional uses of Presocratic dicta, one can gather the texts in which Bacon deploys the legacy of his remote precursors under two headings. These correspond, roughly speaking, to a distinction governing his philosophical writings generally. Thus, in certain passages or works what we might term methodological questions predominate, questions about the end, starting point, and order of demonstration that governs, or ought to govern, scientific inquiry. In other places, he essays a provisional account of the dynamisms and structures of the natural order as he expects them to be disclosed by the methodologically revitalized science of nature that

as though the fragmented character of the texts of the first philosophers was not by accident, but the result of a prudent decision, like his own in the *NO*, to write aphoristically. See *NO* I §86, 138 with “Preface,” 52 and I §71, 114; also *AL* II, 124 and *DAS* VI c. 2, 665–66/450–51.

9. *AL* II, 92. Essentially the same point is made at *DAS* III c. 4, 564/359; *CV*, 602; *RP*, 570.

10. Cherniss, *Aristotle’s Criticism of Presocratic Philosophy*, 347.

he proposes.¹¹ Where the former emphasis is predominant, Bacon generally does not have recourse to particular claims, conjectures, or arguments of individual Presocratics, but concerns himself rather with what he takes to be the defining marks of Presocratic philosophy as such. Notions, insights, and reasonings derived from specific Presocratic thinkers are more likely to surface in writings wherein he sketches the essential features of a true “interpretation of nature,” to invoke a leading term of his philosophical art. Let us consider, to begin, some aspects of the first, more general use he makes of the patrimony of the first philosophers.

A primary incentive for Bacon’s return to the dawn of Greek philosophy is to enlist its help in a campaign, waged over the entire course of his adult life, to discredit the philosophy of Aristotle. On this point he and Heidegger might be said to be in qualified agreement. But while Heidegger had first to disinter “the Philosopher” before he could properly deconstruct him, Aristotle’s authority was still very widely acknowledged in Bacon’s day, and it would continue to hold public sway for a short time thereafter.¹² This situation does much to explain, if it does not quite justify, Bacon’s remarkable willingness to substitute *ad hominem* attack for reasoned argument, such that the Philosopher’s principal failing was to be blinded by vainglorious ambition. The charge is no more likely to impress twenty-first-century readers than it is to distress them. It interests us insofar as the only evidence Bacon educes for it is Aristotle’s alleged treatment of their common predecessors. Alluding to the biblical definition of a false prophet, he writes, accordingly, that “if anyone in philosophy ever came in his own name it is Aristotle, who is his own authority throughout, and who so despised antiquity, that he scarcely deigns even to name an ancient, except to confute and abuse him.” The “dictator” of the Schoolmen is said to have waged “war” on “all antiquity” in order to “extinguish and obliterate all the wisdom of old.” In emulation of Alexander, “his scholar,” Aristotle aspired to a “despotism of thought” akin to Alexander’s dominion over the nations of the ancient world. Or as Bacon’s favorite trope would have it, the Philosopher secured

11. See “Distributio operis,” *NO*, 28–44. Otherwise stated, “nature” is both cause and effect of Bacon’s science of nature. Graham Rees proposes a similar distinction, for which see, e.g., his “Introduction,” *OFB* VI, xxxvi–xxxvii.

12. See, e.g., *Filum labyrinthi, sive formula inquisitionis* (hereafter *FL*), SEH III 502: “Aristotle . . . (upon whom the philosophy that now is chiefly dependeth).”

his “reign” in “the Ottoman manner,” by first killing all his brothers.¹³

Bacon was hardly the first, of course, to fault Aristotle for treating his forebears high-handedly. What sets his criticism apart is its harshness, joined to the philosopher-jurist’s categorical refusal to substantiate his indictment of his renowned predecessor by referring to passages in the *Physics*, say, or the *Metaphysics* where Aristotle might be said to have misrepresented Presocratic positions to advance a position of his own.¹⁴ Bacon’s insouciance on this point, though typical of his approach to any number of other thinkers, is in this case so transparently inconsistent that one might be tempted to conclude that his dispute with Aristotle was merely a pose. Certainly the tone of righteous indignation that suffuses remarks such as those just cited obscures the substance of his opposition to the Philosopher, as also the magnitude of his own ambition, apparent in his willingness, on other occasions, to invoke Alexander’s imperial conquests in order to indicate something of the nature and scope of his philosophizing.¹⁵ Bacon’s anti-Aristotelianism, we may safely conclude, is highly rhetorical in character.¹⁶ But if that is the case, why does he adopt such incendiary language, and for whom is it principally intended?

Bacon appears at times to temper his *ad hominem* denunciations of Aristotle with assurances that there is room enough at his table for “two sources and dispensations of teachings,” his own philosophy and the

13. *RP*, 567 with John 5:43; *AL* I, 24 and 81 with *DAS* III c. 4, 548–49/344–45; *RP*, 561; *AL* II, 92; *RP*, 565; *CV*, 602; *DAS* III c. 4, 56/358–59; *De principiis atque originibus* (hereafter *DPAO*), *OFB* VI, 205–7; *NO* I §67, 106.

14. See Benardete, *The Argument of the Action*, 1.

15. For evidence of Bacon’s ambition to surpass Alexander the Great, see *NO* I §97, 154 together with Proem to the *Instauratio magna*, 2–4 and I §129, 192–96; also *AL* II, 89 with 29 and 38; *RP*, 584; and *CV*, 600. With his customary brio, De Maistre, reflecting on what he deems to be “Bacon’s singular malady of constantly insulting others for his own faults and his own foibles,” concludes that the Lord Chancellor is “the real Ottoman,” who “would have slaughtered everyone.” Yet De Maistre also allows, possibly with *Sophist* 241d in mind, that “all philosophers . . . are . . . Ottomans.” See his *An Examination of the Philosophy of Francis Bacon*, 139n1. In response to this difficulty, I shall here only note, to anticipate slightly, that Bacon does not really believe that Aristotle is exclusively, or even principally, to blame for the eclipse of early Greek philosophy. Nor does he even think that its disappearance is wholly to be lamented. When faulting Aristotle for his treatment of the Presocratics, Bacon downplays both the extent of his own disagreement with them (more of which below) and his very real admiration, discretely acknowledged in other contexts, for Aristotle’s achievements.

16. On Bacon’s objections to the traditional conception of the distinction between “philosophy” and “rhetoric,” see *AL* II, 93; *Valerius terminus, of The Interpretation of Nature: With the Annotations of Hermes Stella* (hereafter *VT*), *SEH* III 228–29; and *DAS* IV c. 1, 580–81/373, together with Cicero, *De oratore*, III.16 and 19.

philosophy that “now flourishes.” In truth, what enables this irenic gesture is also what explains his refusal to enter directly into the merits of his case against Aristotle, namely, that his disagreement with the reigning philosophical tradition is so profound that he does not think it possible to engage in rational disputation without risk of conceding, in the eyes of both foes and potential allies alike, something of the very authority he contests.¹⁷ That he is at once so vocal and so circumspect about his quarrel with the Philosopher is thus a sign of the scope of the revolution he means to effect. As regards the question of his audience, his strident polemics plainly are not calculated to convert the “Schoolmen” of the day. By the same token, however, he would never have presumed to speak so derisively, nor have hoped to find receptive ears, had the Philosopher’s authority not already begun to totter. From this we might reasonably infer that he crafted his treatment of Aristotle to appeal above all to young but spirited and able-minded readers who had yet to form stable intellectual allegiances and who might be expected to derive a certain satisfaction from seeing their elders publicly confuted.¹⁸

Are the Presocratics, then, of interest to Bacon only in the measure that they can be made to testify as innocent victims of Aristotle’s aggression? Since the cult of victimhood was in its infancy at the time, one may safely assume that even the rhetorical force of such a witness would turn upon the reader’s acceptance of an additional premise, namely, that the Philosopher did, in truth, fail to do justice to the genuine “wisdom” of the Presocratics. On what grounds would Bacon have his readers assent to that premise? The author of the *New Organon* is sufficiently concerned about traditional-minded resistance to his dismissal of the old organon that he sometimes comes close to asserting that the greater antiquity of the Presocratics itself suffices to prove their superiority to what came after. Consistently applied, that line of reasoning would lead us to wonder whether an older and thus still wiser teaching lies back behind the phi-

17. See Preface to the *NO*, 56–58 and *NO I* §128, 190–92 with Preface to the *Magna Instauratio*, 24 and *NO I* §33, 76.

18. That Bacon had the young explicitly in view is apparent from his reflection, in *DAS*, on the “prudence” requisite to the transmission or tradition of knowledge. Among the “methods of discourse” he commends for that purpose is the “magistral or initiative method,” which is properly addressed to “sons of science” (*VI c. 2*, 662–63/ 448–49). See also *RP*, 561–85 and *Temporis partus masculus* (hereafter *TPM*), *SEH III*, 528–39, which are addressed throughout to “my sons” or “my son,” and cf. *Apology*, 23c–d.

losophy of the oldest and wisest of the Greeks. And sure enough, in the *Wisdom of the Ancients*, his 1609 collection of commentaries on Greek and Roman fables, Bacon attempts to turn to his advantage human reverence for the past by alleging that the origins of ancient wisdom can be traced back to Egypt or Persia.¹⁹ Even so, he also there insists that at least some Presocratic thinkers had at least a partial access to the truths concealed within the ancient myths, truths that he means at long last to restore to the light of his day.²⁰

To begin to see how early Greek philosophy is capable, in Bacon's judgment, of contributing in its own right to the advancement of learning he seeks to effect, let us examine in more detail his bid for a comprehensive collection of Presocratic writings. Such a collection could be used, he explains, to generate a "calendar" of "doubts" about the natural order, a thing that "hath two excellent uses":

The one that it saveth Philosophy from Errors & falshoods: when that which is not fully appearing, is not collected into assertion, whereby Error might drawe Error, but reserved in doubt. The other that the entrie of doubts are as so many suckers or sponges, to drawe use of knowledge, insomuch as that which if doubts had not preceded, a man should never have advised, but passed it over without Note, by the suggestion and solicitation of doubts is made to be attended and applied.²¹

The overall purpose of the collection, which is actually the second of two calendars envisaged by Bacon, would be to foster a more precise knowledge of our ignorance about nature. The first targets "nature scattered and multiplex" and would catalogue "Problemata Naturalia," which is to say,

19. "Preface" to *DSV*, 625–28/95–99; also *DPAO*, 196–98 and 206; *DAS* II, c. 13, 520–21/316–18. In the *Essays* he is critical of those who would introduce "novelty" by "show of antiquity" (56). And in the *NO* he insists that he himself does not indulge in such pretense, though he allows that "it would not have been difficult" for him to do so (*NO* I §122, 182–84; *RP*, 574–75; *CV*, 604–5). Such disavowals are not terribly persuasive, however. Already in a collection of personal memoranda from the year 1608, he muses "Discoursing scornfully of the philosophy of the graecians wth some better respect to y^e Aegiptians, Persians, Caldes, and the utmost antiquity and the mysteries of the poets" (*Commentarius solutus sive pandecta, sive ancilla memoriae*, SEH XI, 64). See also, *Essays*, 76.

20. See, e.g., *DSV*, 639/712, 649–50/723–24, 655/730, and 672/749 (regarding Democritus); and 677/754 (regarding Heraclitus); also, though less favorably, 672/749 (regarding Empedocles). In the same work, Aristotle's name comes up only twice (672/749 and 676/753), Plato's only once, in quotation (630/702).

21. *AL* II, 91.

particular phenomena in the natural order that give rise to perplexity. A “noble paradigm (*exemplum*)” for it, we may be surprised to learn, is a book known to him as Aristotle’s *Problems*, which he means not so much to imitate or even to emend, as continuously to supplement, since new problems “arise daily.” Bacon’s Presocratic calendar, by contrast, would register “general” doubts, doubts about “nature united or summary.” Its concern is, in other words, the wholeness of the natural whole, and thus has to do with nature’s “principles and fabric.”²² Unlike the collection of “natural problems,” the second calendar does not take its name from the class of doubts or perplexities that delimit it. Adapting to his purposes a title from (pseudo-)Plutarch, Bacon calls it the calendar of the “decrees” or “verdicts (*placita*) of the ancient philosophers.”²³ It is so named because the problems that it would make salient are to be fixed in mind in and through an examination of various ancient theories about nature, considered individually and in the juxtaposition of their differences, rather than by directly confronting this or that natural phenomenon. Bacon does not explain why perplexity about the principles and fabric of nature should be furthered by making a detour through early Greek philosophy. Presumably it is because neither nature’s principles nor nature as a whole ever shows up as such in the experience of this or that particular thing or problem. If so, he would then be endorsing a judgment long associated with Socrates, according to which the things said afford an indispensable mode of rational access to the things themselves.

As already indicated, Bacon was not himself inclined to undertake a comprehensive search for the surviving sources of the Presocratics, so we cannot entirely be sure what his calendar of the *placita* of the ancient philosophers would have looked like. Nevertheless, among the writings

22. DAS III c. 4, 561–62/357–58. In *AL*, Bacon identifies only four candidates for the calendar by name: Empedocles, Pythagoras, Democritus, and Parmenides (II, 92); to these *DAS* adds Philolaus, Xenophanes, Anaxagoras, and Leucippus.

23. The *De placitis decretisque philosophorum naturalibus*, in the Latin translation first published in 1557. This title appears only in *DAS* III; in the parallel passage of *AL*, the second calendar is identified under the heading “Doubts or Non liquets general or in Total.” The name in *DAS* is potentially misleading, however, for toward the end of the section he notes, almost as an afterthought it would seem, that the registry would also include summaries of “recent theories and doctrines,” that is, the attempts of thinkers such as Severinus, Telesio, Patricius the Venetian, or Gilbert, all of whom are said to be resuscitating various ancient theories. The idiosyncratic nomenclature is a sign that in the final analysis, what Bacon means by “ancient” is any philosopher who theorizes in a pre-Baconian fashion.

he left unpublished is one that is highly suggestive in this regard. Like the *Wisdom of the Ancients*, the *De principiis atque originibus* begins by adverting to doctrines purportedly concealed within the “fables” or “parables” of the most ancient times. In the latter work, however, the literary conceit yields almost immediately to a classification of philosophical “sects,” whose positions are criticized in turn, according to the number (whether one, many, or indeterminate) and character (active or immobile) of the putative principles to which each sect appeals, and the way in which these principles are alleged to account for the natural order.²⁴ The schema used to set forth the “verdicts” of Democritus, Parmenides, Empedocles, Heraclitus, and others is so close to the one employed in the *Physics* and *Metaphysics* that it could not possibly have come about by accident.²⁵ And as the details of the analysis make clear, Bacon is also one with Aristotle in regarding the various Presocratic accounts of nature as inferior to his own in all important respects. What is undoubtedly his most extensive treatment of early Greek philosophy therefore amply confirms an explicit premise of his calendar of “the decrees of the ancients,” namely, that none of the ancient “opinions” about nature’s “principles and fabric” included in it contains any “exact” or “purer truth.”²⁶

But if Bacon agrees with the Stagirite that Presocratic philosophy is deficient, he also thinks that Aristotle’s bid to surpass it was a failure, and, thanks to its undeserved reputation as a triumph, a calamitous failure at that. Where did Aristotle go wrong? To anticipate slightly, we

24. See *DPAO*, 210. There is no scholarly agreement as to when the work was composed. Rees, “Introduction,” xxxv, argues that it “was almost certainly written in 1612,” but sets 1610 and 1620 as the upper and lower limits.

25. Compare *DPAO*, 210 with *Physics* 1.2 and *Metaphysics* 1.3ff. Jean-Marie Poussin notices Bacon’s unacknowledged debt to Aristotle in this work in “La notion baconienne de principe dans les *De principiis*,” 106. In his “Preface” to *DPAO* (SEH III, 65–77), Robert Leslie Ellis finds similarities between Bacon’s text and *Metaphysics* Λ.6, though according to Ellis, “Bacon does not appear to have understood Aristotle” (68–69). Joseph DeMaistre regards all such points of affinity between Bacon and Aristotle as reflections of Bacon’s “invariable method of doing what he condemns and condemning what he has done, but always without suspecting it” (*An Examination of the Philosophy of Francis Bacon*, 97).

26. Bacon concedes, *DAS* III, c. 4, 563/358–59, that the fact that “common experience and the ordinary face of things (*obvia rerum facies*) can accommodate itself to many divergent theories” means that every ancient “gloss on nature” must have some basis in reality. He is also prepared to admit that “one [theory] may perhaps be an improvement in one respect, another in another.” He nevertheless insists that no Presocratic was truly equal to the labor, “long and severe” as it is, of a genuinely scientific inquiry into nature as a whole. See also *AL* II, 92.

could say that what is defective in his philosophy, on Bacon's rendering, is largely the result of his failure to capitalize on certain Presocratic insights that he wrongly dismissed as errors, which he then compounded by embracing a Presocratic error that he mistakenly took for an insight. In Bacon's short "history" of philosophy, and particularly in his reconsideration of its origins, we are thus afforded a privileged glimpse of the sense and significance of the Baconian attempt to begin philosophy wholly anew.

III. THE MANNER OF PRESOCRATIC INQUIRY

Following standard scholarly convention, I have been using the epithet "Presocratic" for those philosophers, Socrates excepted, who were active in the sixth and fifth centuries B.C. Someone might object, however, that the coinage is doubly anachronistic in this context, having been minted more than two centuries after Bacon's death, and worse still, in the alloy of a principle that could have meant nothing to those whom it presumes to classify. We may readily concede, with respect to the latter difficulty, that there is no one more entitled to speak for himself and in his own terms than the philosopher, whose life is defined by the ambition to give a rational account of the whole, and of his place within it. Yet we might also observe that in speaking of themselves a great many philosophers, and certainly Bacon among them, have not hesitated to speak for all their fellows, and generally very freely at that. As we have seen, moreover, a strict and philologically accurate reconstruction of early Greek thinking was never much to Bacon's purpose. The terminological issue therefore comes down to this: does Bacon accept the traditional view, according to which Socrates brought about a transformation of philosophy that was definitive for philosophy thereafter?

It is to Cicero that we owe what is perhaps the most renowned description of Socrates's achievement. As he writes in his *Tusculan Disputations*:

Up until Socrates—who heard Archelaus, a student of Anaxagoras—numbers and motions were treated by ancient philosophy, and from whence all things spring forth and to whither they withdraw was studiously inquired after, as also the magnitude of the stars, their distances, courses, and everything celestial. But Socrates was the first who called philosophy down from the heavens, billeted it

(*collocavit*) in cities, and even introduced it in households, and compelled it to inquire about life, mores, and things good and bad.²⁷

That Bacon endorses Cicero's assessment of Socrates is apparent from the various allusions he makes to this passage. Or perhaps he has in mind, rather, the statement that Cicero, in his *Academica*, puts in the mouth of Varro. For Bacon, in agreement with Cicero's Varro but surely not with Tully himself, construes the Socratic turn *to* human affairs as an unequivocal turn *away* from natural philosophy.²⁸ Indeed, he goes well beyond the letter of any Ciceronian text when he asserts that the Socratic revolution in philosophy brought philosophizing about nature effectively to an end: according to the Baconian history of philosophy, rational inquiry into nature "flourished" only fleetingly, from the time of Thales until "Socrates brought philosophy down from heaven to the earth," after which "moral philosophy prevailed" and "diverted men's wits (*ingenia*) from natural philosophy."²⁹ Where Bacon breaks most emphatically with Cicero, however, is in claiming that "natural philosophy should be considered the great mother of the sciences." Whatever inquiry is "torn from this root," including "moral and political philosophy, and the logical sciences," can in no way "grow."³⁰ On Bacon's reading, with Socrates a genuinely philosophical or scientific understanding of human beings, or anything else for that matter, is no longer possible.³¹ And if the Socratic turn is conceived in this way, Bacon's early Greek philosophers would be "Presocratic" in a sense that is at once traditional and unprecedented. Before examining more closely the standing of "natural philosophy" in his survey of philosophy's past, we might usefully take note of a second feature of Presocratic thought highlighted by him.

As Bacon tells the story, early Greek philosophy distinguished itself as much by its manner, so to say, as it did by its matter. In the "Preface" to the *Novum organum*, for example, he praises "the more ancient of the Greeks (whose writings have perished)," because they, in contrast

27. *Tusculan Disputations*, V.iv.10.

28. *Academica*, I iv.15–16.

29. *NO I* §79, 124–26, which marks the only appearance of Socrates in that writing. See also *AL I*, 32, and *DAS I*, 46.

30. *NO I* §§79–80, 124–26, together with §107, 164 and §127, 190. See also *DAS III c. 1*, 540/337.

31. On the post-Socratic disregard for physics, see *NO I* §§78–79, 122–26; also *CV*, 595 and *FL*, 499.

to their successors, “more prudently kept themselves between” dogmatic “arrogance” and skeptical “despair.”³² He makes no mention, in this context, of the Presocratics’ singular devotion to natural philosophy. Nor does he do so further on in the same writing, when he draws a connection between their observance of the philosophical mean and the way they chose to philosophize publicly, or in writing. The “first and most ancient inquisitors of the truth were accustomed,” he claims, “to cast the knowledge that they gathered from the contemplation of things and determined to hide away (*recondere*) for use, into *Aphorisms*, or brief and scattered sentences not restrained by method.” He does not explain how he can speak with such confidence about the intentions of authors whose works have for the most part long since disappeared.³³ He is certain, in any case, that the aphoristic form in which their philosophy has come down to us distinguishes their lack of pretense from the “guile and artifice” of the philosophical authors who followed them.³⁴

In the *Advancement of Learning* Bacon makes a related point. To Aristotle’s charge that Democritus typically resorts to similes where demonstrative arguments are called for, he counters that

... those, whose conceites are seated in popular opinions, neede onely but to prove or dispute: but those, whose Conceits are beyonde popular opinions, have a double labour; the one to make themselves conceived, and the other to prove and demonstrate. So that it is of necessitie with them to have recourse to similitudes, and translations, to expresse themselves.

Bacon sides with Democritus against Aristotle because when it comes to “the deliverie and teaching of knowledge . . . which is newe and forreine from opinions received,” the atomist’s similes reflect the distance separating philosophical understanding from common opinion far more accurately than any syllogisms ever could.³⁵ In still another remark about Presocratic foreign policy, as it were, Bacon observes that “the more an-

32. “Preface,” *NO*, 52.

33. For this point he might have had recourse to *Protagoras* 343b, or Plutarch, *Life of Nicias*, 23.2–4. But whatever his sources, he does not bother to inform his readers of them.

34. *NO* I §86, 138. For the value of aphorisms more generally, see *AL* I, 29–30 and 35–36; *AL* II, 124, 159, and 162; *DAS* VI, c. 2, 665–66/450–51; VIII, c. 2, 750/SEH V 36 and 772/56; *New Atlantis*, SEH III, 165; and *Maxims of the Law*, SEH VII, 321.

35. *AL* II, 125; *DAS* VI c. 2, 666–67/452. See also *Historia vitae et mortis* [*HVM*] SEH II, 137/V, 247.

cient of the Greeks”—he mentions Empedocles, Anaxagoras, Leucippus, Democritus, Parmenides, Heraclitus, Xenophanes, and Philolaus by name—“did not open schools, but dedicated themselves to the inquisition of the truth with greater silence, and severity, and simplicity.” He objects to the institutionalization of philosophy in schools not only on the grounds, already voiced in antiquity, that they tended to harden genuinely philosophical disagreements into innumerable “sects and heresies,” wherein captiousness inevitably prevailed over reason.³⁶ Yet he also faults them because of their inability to resist the gravitational pull exerted by “the comprehension and disposition of the vulgar.”³⁷ In sum, the reticence of the Presocratics, evident in their laconic and recondite speech and in their refusal to seek institutional shelter for their philosophizing, attests, for Bacon, to the greater acuity and depth of their thought—although it also points to what he regards as a fundamental defect in their approach to philosophizing, as we shall see in due course.

These considerations help to explain Bacon’s insistence, paradoxical on its face, that with Socrates the scientific study of nature came abruptly and prematurely to an end. To this one might obviously object that Aristotle had already said as much about his teacher’s teacher, and had labored mightily to remedy this state of affairs.³⁸ Indeed, after two generations the Peripatetic school had generated a volume of works on natural philosophy that easily dwarfed the writings on that subject produced by all of the Presocratics put together, as Bacon would have known full well from his reading of Diogenes Laërtius, to say nothing of his acquaintance with the *Physics* and any number of other ancient texts. Bacon could be said to agree with Aristotle about the state of physics after Socrates, but only on condition that Aristotle’s own science of nature be counted as nothing. In order better to see why he thought that to be the case, it is necessary to examine at closer quarters why the Lord Chancellor thought that the doctrines of the ancient schools were accessible and appealing to the vulgar in a way that early Greek philosophy was not.

36. *NO* I §76, 120, together with §76, 120; §90, 146; §96, 152–54. In *NO* Bacon is somewhat ambivalent about the Platonic school, for which compare “Plan,” 44 with I §67, 108 and §75, 118. On “schools and colleges” in Bacon’s own time, see *NO* I §63, 100; §§78–79, 122–24; 89, 142; §121, 180; II §15, 252; §36, 326 and 334; §48, 384 and 392; and “Monitum,” *HV*, SEH V, 131.

37. *NO* I §71, 112–14, where Bacon goes so far as to liken the founders of the ancient schools to stay-at-home sophists. See also *RP*, 565–66.

38. See *Metaphysics* A.6.987b1–2; N.4.1078b18; *Parts of Animals* A.1.642a28–30.

According to Bacon's analysis in the *Novum organum*, the root problem with the natural philosophy of Socrates's successors is precisely its "Socratic" character, though he himself does not quite put it that way.³⁹ Thus, in aphorism 125 of Book I, Bacon says of the "form of inquiry and discovery" employed by those whose philosophies "prevailed (*valuerent*) among the ancients" that on the basis of "a few examples and particulars," illuminated by "common notions" and "the most agreeable of the received opinions," it habitually "flew up (*advolarent*) to the most general conclusions or principles of science."⁴⁰ Although he does not here direct his sights exclusively upon Aristotle, we can recognize in this statement a reasonably accurate depiction of the Philosopher's scientific procedure. Suffice it to recall the opening chapter of the *Physics*, and its famous insistence on the necessity of beginning with what is "first for us," a phrase meaning not "that which we who are wise already know to be true," but that which is said to be the case by all, or by most, or at least by those held by all or by most to be most renowned or most reputable.⁴¹ But to begin in this way is to begin both too early and too late. Too early because the "first for us" necessarily provides at best a very limited experience of things as they are "in themselves," such that any conclusion we might derive from it cannot help but restrict our conception of them. Too late because, unbeknownst to us, the "primary notions of things (whence all else flows)," are in fact derivative or secondary, being received, stowed away, and laid up by the mind "in an easy and supine gulp" from a "corrupt, confused, and rash" abstraction from things.⁴² And as if all this were not enough, the reliance upon ordinary language that is common to all the Socratics makes the starting point of their philosophizing still more problematic, since ordinary words "assume their meaning mostly according to vulgar capacity, and divide things along the lines most conspicuous to the vulgar intellect."⁴³

39. In what follows I am greatly indebted to Kennington, "Bacon's Critique of Ancient Philosophy," in *On Modern Origins: Essays in Early Modern Philosophy*, 17–32.

40. *NO I* §125, 188.

41. *Physics* A.1.184a17–b13; *Nicomachean Ethics* H.1.1145b3–8; also *Topics* A.1.100b21–23; *Posterior Analytics* B.19; *De caelo* A.3.270b1–24. On reputable opinion, see Pritzl, "Opinions as Appearances."

42. "Proem," *Instauratio magna*, 2

43. *NO I* §59, 92 together with §43, 80; §54, 88; §60, 92–94; §63, 98; §96, 154–56. Or as Bacon writes in *DPAO*, 208, "Plato assigned the world to thoughts, and Aristotle thoughts to words." But compare *NO II* §26, 288.

Every bit as troublesome as the Socratic starting point, and closely tied to it, is the penchant Bacon attributes to the Socratics to “fly” or “leap (*exilire*)”⁴⁴ to that which they suppose to be first or highest or most intelligible.⁴⁵ Bacon does not attempt to trace this feature of ancient theorizing back to a single source. Among its principal roots is the propensity of the human mind to seek some object wherein it might “find repose (*acquiescat*),” as also, in those of exceptional endowment, “a certain ambition of intellect.”⁴⁶ Whatever the ultimate source or sources of their noetic “immoderation (*interperantijis Philosophiarum*),” the consequence is in any case an “apotheosis” of error, solemnized in doctrines involving “abstract forms,” for example, or “final” and “first causes.” As goes without saying, there is no place in Bacon’s science of nature for doctrines of that sort. We should note, however, that his opposition to them is in the first instance a function of his general diffidence regarding the possibility of a rational ascent to the first things. As he puts it in the *Novum organum*, the human intellect requires not “wings but lead and ballast.” Or in somewhat more prosaic terms, what is needed is “contemplative prudence.”⁴⁷

That the Presocratics were not nearly so beholden to the “first for us” as are the philosophers who followed them, and that their thinking did not ordinarily conclude in abstract forms, or first and final causes, are considerations that do much to explain their standing in Bacon’s eyes. Although he is not quite prepared to call any of the fruits of their several efforts a “pure,” “unmixed,” and “immaculate science of nature,” he is perfectly willing, without even entering into the particular merits of their various teachings, to applaud their “homoeomera,” “atoms,” “heaven and earth,” “strife and friendship,” and “the resolution of bodies into the undifferentiated nature of fire, and their reconstitutions as dense,” because all of them have “some savor (*aliquid sapient*) of the natural philosopher, and the nature of things, and experience, and bodies.”⁴⁸ Which

44. NO I §125, 188; also I §20, 70; §64, 100; §104, 160.

45. On “notior naturae,” see “Distributio opera,” *Instauratio magna*, 30; NO I §22, 30 and §48, 84 with II §4, 204. Compare Aristotle, *Posterior Analytics* A.2.71b32–72a6 and *Physics* A.1.184a16–20.

46. NO I §48, 64 and §84, 100–102; but the entire account of the “Idols” is pertinent here, for which see especially NO I §§38–68, 78–108.

47. NO I §58, 92; §67, 106; §65, 102; and §104, 162.

48. Compare NO I §63, 98 and I §51, 88 and with “Preface,” *Instauratio magna*, 22; I §96, 152–54.

brings us back to the question of the matter, as distinguished from the manner, of Presocratic inquiry.

IV. THE MATTER OF PRESOCRATIC INQUIRY

I have been arguing that Bacon's critique of the most influential ancient accounts of what is first by nature or in itself, like his critique of the deference shown by many ancients to what is first for us, is advanced largely along methodological lines and thus has to do, in the first instance, with the manner in which inquiry and argument ought to be conducted. This is not to say that the philosopher's quarrel with his predecessors is merely procedural. That he characterizes his break with the past essentially in terms of a disagreement about the best "way (*via*)" to philosophize cannot be denied. Not for nothing does he entitle "the chiefest of his works" the *Novum organum*.⁴⁹ Even so, it is clear from his praise for Presocratic "natural philosophy," and from his censure of its eclipse after Socrates, that the manner in which Baconian philosophy is to be prosecuted has everything to do with the question of its proper object, its matter.

On the subject of natural philosophy a caution is in order, however. Bacon is not merely attempting to restore interest in a particular dimension of reality that, as he saw it, had long suffered from neglect. For whatever else he might mean by calling the philosophy of nature "the great mother of the sciences," the phrase surely suggests that rational inquiry into everything else ought to be reconsidered in its light. To put the point another way, the Baconian science of nature is not, as modern natural science is sometimes said to be, "metaphysically neutral," as though it neither required nor pointed to an overarching conception of what it means primarily or most truly to be or to exist. Even if it were the case that Bacon aspired to such a science—he assuredly does not—in the circumstances in which he lived and wrote it would have been unthinkable. Despite his disdain for the dominant scholasticism of his day, he could not possibly have disagreed with its conviction, which had ample Scriptural warrant, that the study of nature is ineluctably related to "nat-

49. On his innovation as a "way," see, e.g., "Proem," *Instauratio magna*, 5. On Bacon's assessment of *NO*, see "The Life of the Honourable Author," by William Rawley, Bacon's chaplain, secretary and literary executor, SEH I, 11; also Epistle Dedicatory, *Advertisement Touching An Holy Warre*, SEH VII, 13.

ural theology,” and is in that sense at least “metaphysical.” And although other contemporary readers might well have read Romans 1:20 differently, they, too, could be counted upon to examine Bacon’s inquiries into nature with an eye to their theological suppositions and implications. These considerations bear greatly upon the philosopher’s interpretation of Presocratic philosophy. Some years ago, Werner Jaeger complained of the scholarly tendency, nourished by Aristotle and a “zeal for proving the modernity” of the Presocratics, “to emphasize” their achievements as “natural scientists,” and therewith to ignore their concern with “the problem of the divine.”⁵⁰ The divine may not have been a “problem” for the scholars whom Jaeger had in mind. It certainly was for Bacon, as is apparent in his approach to the early Greek *phusikoi*.

Two figures clearly represent, for Bacon, the nadir and the pinnacle of Presocratic investigations of nature: Pythagoras and Democritus. The two are not commonly paired in recent histories of early Greek philosophy, but Bacon repeatedly considers them together. Their common denominator, on his rendering, is that each had identified as a principle of nature what he himself is prepared to count among the “essential forms of things,” and specifically, a “mathematical form” that is also a “natural form.”⁵¹ Here, however, the similarities end. While the English philosopher credits the Ionian mathematician with a few other attainments—he approves of the legendary Pythagorean attention to diet, for example—they are by his light rather modest in scope.⁵² For the most part, he invokes Pythagoras and his school as a case study of how *not* to study nature. More precisely stated, his Pythagoras stands for the “corruption” of philosophy by “superstition.” Links traditionally alleged between Pythagoreans and “the heresy of the Manichees” or “the superstition of Mohammed” might be said to lend a certain credibility to the charge, as does the Pythagorean doctrine of a world soul or spirit.⁵³ But what Bacon

50. Jaeger, *The Theology of the Early Greek Philosophers*, 6–8.

51. *AL* II, 87–88; *DAS* III c. 6, 576–78/370–71; and see *CDNR*, 17–18/422. As others have noted, Bacon might easily have been inspired to link Pythagoras and Democritus by Diogenes Laërtius, *Lives of Eminent Philosophers*, IX.38. In other texts, he counts Pythagoras and Democritus in the company of his Plato, on the basis of their collective reputation as great travelers, a reputation that he is quick to discount (*NO* I §72, 116; *RP*, 564).

52. See, e.g., *AL* II, 92; *DAS* IV c. 2, 600/392. Yet Bacon is also critical of certain particulars of their dietary practices, for which see *AL* II, 95; *DAS* IV c. 1, 584–85/377; VIII c. 2, 758/V, 44; *HVM* 153/261.

53. On Pythagorean superstition, see *NO* I §65, 102 and §71, 114; and *Sylva Sylvarum* [SS],

takes to be the principle sign of the school's superstitious character, and the gravest cause for concern, is its fascination with pure number. He acknowledges that "many parts of nature cannot be understood with sufficient subtlety, nor demonstrated with sufficient perspicuity, nor accommodated to use with sufficient dexterity and certainty, without the help and intervention of mathematics," and that the form of numerical quantity is very important in that regard. Because it is the "most abstracted" of mathematical forms, however, Bacon cautions that it holds a treacherous appeal for the human mind, flattering the human proclivity for high-flown theorizing. In succumbing to the charm of numbers, Pythagoreanism on Bacon's rendering is not really philosophy at all, but "mystic arithmetic," or "speculation on holiday (*expatiatio speculationis*)."⁵⁴

That Democritus ascribed the "principles of the variety of things" to the shapes of his atoms means that he, too, had recourse to a "natural form" of a mathematical sort, namely, geometric quantity. It is hard to imagine a Presocratic whose theorizing is less conducive to "superstition," however. Indeed, Bacon freely admits in his "Of Atheism" that no ancient school was more commonly accused of atheism than that derived from the philosophy of Democritus and his fellows.⁵⁵ He also freely explains why: the atomists "did not suppose a *Minde* or *Reason* in the frame of things, but attributed the *form thereof able to maintaine itself to infinite essaies or proofes of Nature*, which [they] tearme *fortune*."⁵⁶

"Century X," SEH II, 640–41; also *Cogitationes de natura rerum* (hereafter *CDNR*), SEH III, 18/V, 422; *CV*, 602. In *HVM* 154/263, on the other hand, Bacon concedes that the "sublime contemplations" fostered by Pythagorean and Platonic "superstition" may be conducive to a long life.

54. *DAS* III c. 6, 576–78/370–71, and *AL* II, 87–88. Also *RP*, 565.

55. *Essays*, 51 and 54. On Democritus's dubious reputation in antiquity, see, e.g., Cicero, *De natura deorum* 1.23.65–1.26.73; 2.30.76 with 1.42.120. Talk in the *Essays* of a "school" of atomism might seem to be directly at odds with the praise, noted earlier, that the *NO* bestows upon Leucippus and Democritus, among others, precisely because they *did not* open schools (*NO* I §71, 114). Yet even in the latter work, Bacon refers to a "school of Leucippus and Democritus" (*NO* I §51, 88; §57, 90), as he does on numerous other occasions. Rather than accuse him of falling into a self-contradiction so gross as to be laughable, it is more reasonable to allow him a tacit distinction between "schools" deliberately instituted by their founders—the Academy and the Lyceum, for example—and those of looser inspiration.

56. *AL* II, 86. In the parallel passage of the Latin version, Bacon is still more explicit, admitting his preference for the natural philosophy of those "qui *Deum* et *Mentem* a *fabrica rerum* amoverunt, et *structuram universi* infinitis *naturae praelusionibus* et *tentamentis* (quas uno nomine *Fatum* aut *Fortunam* vocabant) attribuerunt, et *rerum particularium causas* *Materiae necessitate sine intermixtione Causarum Finalium* assignarunt" (*DAS* III c. 4, 569–70/363–64, emphasis added).

In an essay entitled “Of Superstition,” itself the immediate sequel to “Of Atheism,” he urges that it “were better to have no Opinion of *God* at all; then such an Opinion, as is unworthy of him,” a principle which, if true, might possibly justify his ranking Democritus over Pythagoras.⁵⁷ But praise so faint hardly explains, or rather excuses, his preference for the philosopher from Abdera over Plato and Aristotle, whose doctrine of final causality presupposes, on his reading, that “a mind or reason” is “in the frame of things.”⁵⁸

Bacon responds to this difficulty in a variety of ways. Against those who would reject atomism in favor of a teleological physics, he goes on the offensive by asserting that the divinely instituted order that they purport to find within nature leaves God Himself with little or nothing to do or account for. It is much more in keeping with “Divine Providence,” he asserts, that nature should “operate in one way (*aliud agit*),” while “Providence elicits another,” divine agency here being assimilated to that of a most prudent politician, who is able “to make use of the efforts of others for his purposes and desires without imparting to them anything of his counsel.”⁵⁹ As for the accusation of atheism, Bacon elsewhere counters, in yet another paradoxical turn of the tables, that the school of atomism “doth most demonstrate Religion,” since “it is a thousand times more Credible that, foure Mutable Elements, and one Immutable Fifth Essence, . . . need no God; then that an Army, of Infinite small Portions, or Seedes unplaced, should have produced this Order, and Beauty, without a Divine Marshall.”⁶⁰ Just what one ought to make of either argument the reader must judge for himself, although it is surely difficult to see how the second is to be squared with the first.⁶¹ I hasten to add, however, that Bacon never goes so far as to suggest that the atomists themselves actually intended to demonstrate the religion allegedly demonstrated by their school. Nor does he himself ever attempt to work out a “natural

57. *Essays*, 54.

58. *DAS* III c. 4, 570/364; *AL* II, 86–87.

59. *AL* II, 86–87 and *DAS* III c. 4, 571/365; but compare *DAS* II c. 13, 521–24/318–20; and *DPAO*, 252.

60. *Essays*, 51.

61. On other occasions Bacon attempts to salvage Democritus’s reputation by suggesting that the ancient materialist, in affirming the eternity of matter, but denying the eternity of the world, drew nearer to the Biblical doctrine of creation, which on Bacon’s reading of Genesis regards “matter without form as existing before the six days’ works”; see *DSV* 723–24/649–50; also *DPAO* 250–52.

theology” of Democritean inspiration. In fact, immediately after formulating his anti-teleological case for “Providence” in the Latin *Advancement*, he expressly distances himself from the atomists because, in effect, they foolishly left themselves vulnerable to the grave charge commonly leveled against them:

And when Democritus and Epicurus preached (*praedicabant*) their atoms, they were to that extent tolerated by some among the more subtle; but nevertheless, when they asserted that the very fabric of things [i.e., the ordered universe as a whole] itself coalesced, through their [i.e., the atoms’] fortuitous concourse, without a mind, they were received by all with laughter.

Although presumably for different reasons, the subtle few willing to give atoms a hearing agreed with the unsubtle many that the atomists’ conjecture about the ultimate origins of the visible whole was not just mistaken, but ridiculous. Bacon is scarcely inclined to take issue with either party. He concludes, somewhat ambiguously, that “so far are physical causes from leading men away from God and Providence, that those philosophers occupied in rooting them out would find there was no issue (*exitum*) from the business unless in the end (*postremo*) they were to have recourse (*confugiant*) to God and Providence.”⁶²

Bacon’s consideration of Democritus and his followers is notable in several respects. Ancient atomism is the only example Bacon ever offers of what he had claimed to be a defining characteristic of early Greek philosophy as a whole—and one that he deems praiseworthy, as we have seen—namely, its refusal to pander to common or vulgar apprehension.⁶³ Yet as an example of Presocratic “wisdom,” atomism is at least in one regard said to be so manifestly wrong-headed that even the vulgar can see the error of its ways. The example is all the more curious in view of the fact that, apart from his treatment of Pythagoras, Bacon is generally hesitant to find fault with the Presocratics. He could hardly have ignored this particular shortcoming of the atomists, of course, given their long-standing reputation as heterodox, to say nothing of his readers’, or his

62. *DAS* III c. 4, I 571/IV 365. There is nothing in *AL* to correspond to this passage.

63. That atomism, in particular, is above the heads of the vulgar is a point Bacon makes repeatedly, as also that the vulgar response is to dismiss it as unserious or trifling or childish, for which see *CV*, 598; *Cogitationes de scientia humana* (hereafter *CSH*), *SEH* III, 194; and *DPAO*, 204. In none of these unpublished writings, however, does he also assert that even subtler minds find something to laugh at in atomistic doctrine.

own, theological concerns. But in that same light, the fact that his censure of Pythagorean “superstition” is far more severe than his account of Democritean atheism seems strangely disproportionate.

To grasp what Bacon took to be the real error of the atomists, it would be useful to reconsider his curious assertion that natural philosophy fell into oblivion after Socrates.⁶⁴ Peripatetic physics does not constitute proof to the contrary, as we have seen, because the use it makes of teleological explanation signifies, for Bacon, that it is not a genuinely or at least sufficiently “physical” physics. Atomism, which plainly is not subject to the same limitation, is far harder to square with Bacon’s historical thesis. For as he knew perfectly well, in Epicurus, and centuries later in Lucretius, the Presocratic natural philosophy of Leucippus and Democritus enjoyed a very long afterlife. And even though he thinks that what is distinctive about Epicurean natural philosophy is decidedly inferior to its original inspiration,⁶⁵ the history of atomism in the ancient world surely invites us to question the basis for Bacon’s distinction between “pre-” and “post-Socratic” philosophy.

As it happens, only a page or so before referring to the revolution effected by Socrates, the author of the *Novum organum* himself insists that “the ancient philosophies” did not simply fall into disuse or become obsolete after Plato and Aristotle, but rather endured “down to the time of Cicero, and for centuries thereafter.” It was only with the flood of the Roman Empire by barbarians, he explains, that the works of the Presocratics suffered “shipwreck,” such that the writings of the leading Socratics, being “lighter and less solid,” alone remained afloat, so to be carried by time’s current down to us.⁶⁶ He enlarges upon this historical turn of events in unpublished fragments, where he claims, on the basis of an appeal to the authority of Juvenal and Cicero, that among wise and discerning Romans the natural philosophy of Democritus was held in the very highest regard.⁶⁷ Socrates’s successors are not to be blamed for the eclipse of Presocratic after all. They merely took advantage, we could say, of an opportunity. But

64. *NO I* §79, 124.

65. See, inter alia, *Meditationes sacrae*, SEH VII, 241–42 and 253; *DSV* 655/730; *DAS* II, c. 13, 524 with 528/321 with 325; *VT*, 238; *TPM*, 532 with 537; and *RP*, 565.

66. *NO I* §77, 120.

67. *RP*, 567–68 and *DPAO*, 204–6, citing *Satires* x.48–50. In the latter work he also asserts that Cicero “mentions [Democritus] everywhere with the highest praise.”

does this mean that Bacon really holds Genseric and Attila responsible?

Surely not. The Vandals, Goths, and Huns may well have occasioned the end of natural philosophy of the sort that Bacon could approve, but they could hardly have been its cause. Bacon goes on in the next aphorism of the *Novum organum* to state, accordingly, that “only three revolutions and periods of learning (*Doctrinarum*) can rightly be counted.” The first he identifies with the Greeks *tout court*; the second he ties to the Romans; the third concerns “us,” by which he means, “the nations of western Europe.” Now it is “manifest,” he continues, that during this third period, “by far the greatest part of the most eminent wits dedicated themselves to theology,” which, consistent with the turn to “moral philosophy” in the preceding period, meant the continued disregard for or corruption of natural philosophy. Indeed, in the very next aphorism, he takes moral philosophy to be “standing for (*vice*) theology among the pagans,”⁶⁸ from which it follows that broadly theological interests, or more simply stated, “religion,” poses as serious an obstacle to the scientific study of nature as Pythagorean “superstition” ever did.⁶⁹ And although the *Novum organum* does not quite come out and say so, it does enable the reader easily to infer that the real reason that Presocratic philosophy has largely disappeared, despite its greater “savor of the natural philosopher, and the nature of things, and experience, and bodies,” has everything to do with its incapacity to appeal or credibly respond to the religious and theological interests of all and sundry.⁷⁰ In sum, Bacon has no doubts that the “school of Leucippus and Democritus penetrated further into nature” than did any other in antiquity.⁷¹ But among its greatest

68. *NO* I §§78–79, 122–24.

69. On the threats posed by “religion” and “theology” to natural science see, inter alia, *NO* I §46, 82; §48, 84–86; §62, 96; §65, 100; §89, 142–44; and §96, 152–54. Also *FL*, 499; *TPM*, 533; *CV*, 595–96. In the *NO* Bacon provides little or no principled basis for distinguishing between “religion” and “superstition.” Nor does that work afford a single example of a positive contribution made by “religion” of whatever sort to the study of nature; much less does it attempt to derive demonstrative knowledge of God’s “eternal power and Godhead” from study of the natural order. At the end of both the first and the second books of the *NO*, Bacon does insist that “sound (*sana*) religion” (I §129, 196) or “religion and faith” (II §52, 446) should have a regulative role in the new science of nature he envisages, but he does next to nothing in that work to explain what religion and faith he has in mind, what would make it “sound,” in what way it would regulate science, or why science should need its help.

70. He is fairly explicit on this point in *VT*, 227–28.

71. *NO* I §51, 88; also *DAS* III c. 4, 570/364; *AL* II, 86. Compare Aristotle, *De generatione et corruptione* A.2 315a35–b2; *Metaphysics* N.4.1078b20–21.

merits, on his telling—that it does not, in Socratic fashion, call its inquiries down from the heavens to earth—also proves to be among its greatest defects.

V. DEMOCRITUS

Bacon's esteem for Democritus is apparent from his earliest attempts to put his own philosophy to paper down to his last. Contrary to what has sometimes been said, however, he was never a committed atomist.⁷² Perhaps the closest he comes is an early fragment, the *Cogitationes de natura rerum*, which abruptly begins, "Democritus' teaching on the atoms is either true, or usefully employed for demonstration." One need only turn the page, however, to find him voicing certain reservations about the doctrine, after which he quickly drops the subject.⁷³ More qualified, and more representative of his views perhaps, is a remark appearing in his *Valerius Terminus*, another unfinished writing from the around the same period. "For no man shall enter into inquisition of nature, but shall pass by" Democritus's opinion regarding "the beginnings of things."⁷⁴ But to pass by is to leave behind, and in the *Novum organum*, his verdict was unequivocal: the atom "presupposes a vacuum, and invariant (*non fluxam*) matter, . . . both of which are false."⁷⁵ At every stage of his career Bacon treats the ancient atomist as a vital interlocutor, but the doubts he registered early on yielded in time to a settled opposition to the core of Democritean physics.

It is not possible within the confines of the present essay to provide a thorough consideration of Bacon's assessment of Democritus. A schematic summary must suffice for present purposes. We might note at the outset, however, that Bacon shows virtually no interest in engaging, at least openly or at any length, any ethical doctrines traditionally credited to the atomists.⁷⁶ Still more surprising, perhaps, is that the distinction

72. For a useful survey of the literature, and a detailed and instructive discussion of this point, see Graham Rees, "Atomism and 'Subtlety' in Francis Bacon's Philosophy," *Annals of Science* 37 (1980): 549–71.

73. *CDNR*, 15/419.

74. *VT*, 227–28.

75. *NO* II §8, 212 with I §66, 106; see also II §39, 342–44.

76. He is not entirely dismissive of ancient hedonism: see, e.g., *Essays*, 8; *AL* I, 52; *DSV* 624–26/762–64. But if he knew anything about the particulars of Democritus's moral doctrine, he does not let on to his readers.

between primary and secondary qualities, which played such a significant role in the thought of Bacon's immediate successors, and for which a remote inspiration might plausibly be attributed to Democritus, seems not to figure in his own philosophy.

One Democritean dictum of which Bacon was especially fond is that "the truthe of Nature lyeth hydde in certaine deepe Mynes and Caves."⁷⁷ The theme of nature's hiddenness, or to use his preferred term, its "subtlety," is ubiquitous in his writings, but appears scarcely at all in Aristotle, whose physics revolves, as we know, around the notion of form. According to the Lyceum, the form of a given thing, which is to say its *eidos* or *species* or "look," the way it ordinarily shows up and makes itself known, is also that which is chiefly responsible for its being what it is. Democritus refuses to be satisfied by the obvious looks of things, which is ultimately why, Bacon indicates, his philosophy appears so strange to the many.⁷⁸ But while the English philosopher applauds the atomist's search for the latent principles of what is patent, he also cautions that to proceed in this fashion entails significant risks. One great risk is that the subtleties of nature will lead the inquirer to despair of the possibility of making any headway in our knowledge of the world.⁷⁹ That Democritus was not undone by a debilitating skepticism is particularly to his credit, Bacon believes, as is the reason for his persistence, which he traces not to a certain excellence of character or temperament, but to what might call the leading insight of Democritean physics, namely, that "it is better to dissect (*secare*) nature than to abstract it."⁸⁰

The warrant for nature's dissection is that "the minute parts of bodies" are responsible for "great effects," and even for astonishingly great effects, as scientific developments in our own age have made apparent to all.⁸¹ Such is nature's subtlety, moreover, that these minute parts have never been seen, says Bacon in agreement with Democritus, and never will be seen, as twentieth century physics also makes clear.⁸² What Ba-

77. See *AL* II, 80; *DAS* III, c. 3, 547/343. Also *DSV*, 672/749; *Aphothegms*, 162.

78. See note 34, above. Also *Cogitationes de scientia humana*, 194.

79. See "Preface," *NO*, 52.

80. *NO* I §51, 88 with II §43, 364 and §26, 288. See also his approval of the Aristotelian dictum that the "nature of a thing is best discerned in its smallest portion": *DAS* II c. 2, 449/297 with III c. 1, 541/338.

81. *CDNR*, 15-16/419; *SS* I §98, 381. Also *VT*, 238.

82. See *DPAO*, 200; also *DAS* V c. 2, 631/419; *NO* II §6, 210; *CDNR*, 15-16/419-20.

con means by “dissection,” accordingly, is chiefly a work of the mind, not the hand. In the experiments in which it is carried out, and the experiences that result, hands certainly contribute, but it is methodologically informed intelligence that takes the lead and measure of it all.⁸³ This is not to say that the ultimate object of scientific inquiry is primarily no-etic. Although he rejects atoms, Bacon shares the atomists’ commitment to explaining bodily things in terms of minute principles, or “parts” if you will, that are themselves bodily.⁸⁴ Hence his claim that “nothing in nature truly exists besides individual bodies,” incontrovertible proof for which would seem to lie well beyond experience of any sort.⁸⁵ Bacon’s praise for the school of Democritus, and its practice of “dissection,” has everything to do with its unwavering commitment to the material order.

Among the clearest Baconian statements of the virtues of Democritean physics, as also of its vices, appears in *De principiis atque originibus*. There Bacon insists that “a manifestly invincible necessity compels men’s thoughts (if they wish to be consistent) to atoms.” We are compelled to consider this possibility because “entities cannot be constituted from what are not entities,” any more than “principles”—which on his analysis must as such be “constant (*inconcussum*) and eternal”—can be constituted from what are not principles. Whatever their explanatory shortcomings, atoms manage to square this particular circle, being at once entities and principles.⁸⁶ To enlarge upon the point, Bacon observes that Democritus, in company with “almost all the ancients,” recognized that the origin of the motion and form of material things had to be not only material but also in and of itself “active.” And this means that it “had some form and distributed its form, and had the principle of motion within itself.” In this the atomists distinguished themselves from Plato and Aristotle, for whom matter was, as Bacon elsewhere puts it, without determination, being “despoiled, and passive,” and “a common harlot” to the forms that are its “suitsors.”⁸⁷ What set the atomists apart even from other Presocratics, however, was that they realized that “the seeds of things, or their virtues, were in no way similar to things subject to the senses”—

83. See SS I 98, 381; also CDNR, 15–16/419–20; VT, 238.

84. See Richard Kennington, “Bacon’s Ontology” and “Laws of Nature,” in *On Modern Origins*, 32–56.

85. NO II §2, 202. See also NO I §4, 64; DAS III c. 4, 550–51/346–47.

86. DPAO, 252–54.

87. DPAO, 206–8; also 220–22 and 260; DAS II c. 13, 523/320; VT, 227–28 and 243.

contrary to Thales's "water," for example—"but were marked with a nature entirely unseen and clandestine."⁸⁸ As this last observation makes clear, it is thus not only, nor even chiefly due to their microscopic size that the atoms have not and cannot be seen. Because atoms are meant to account both for the intelligibility and for the existence of that of which they are the principles, they can neither be nor appear to be quite like anything else.

Bacon goes on to argue, however, that Democritus was unfaithful to his own best insight, for "he ought to have attributed a heterogeneous motion to the atom, no less than a heterogeneous body and a heterogeneous virtue." In this one respect, in fact, Bacon deems him to be "even beneath mediocre philosophers," insofar as the percussive motion that he imputes to the atoms is entirely of a piece with the kind of mechanical motions that are familiar to us from everyday life.⁸⁹ Baconian matter, in contrast, is infinitely more active or lively, so to say, than that of Democritus, or of any other ancient philosopher. Hence in the *Instauratio magna*, for example, Bacon announces a forthcoming "history" of nature's "cardinal virtues," in which are "constituted," he says, "the primordia of nature," because they are "the primary passions and desires of matter." And in the *New Organon* he calls for study of the "appetites of bodies," and later goes on to list a remarkable array of such "principles through which things come about" as distinguished from merely "quiescent principles."⁹⁰ Democritus thus proves to be guilty in his own way of a failing Bacon regards as common to all the ancients, namely, to have "framed" his theorizing "with reference to too few particulars."⁹¹ Despite his care and acuity in discussing the material principle of bodies, the movement the Presocratic philosopher ascribes to his atoms is far too limited, or too static we might almost say, to account for the im-

88. *DPAO*, 200.

89. *DPAO*, 202; *NO II* §48, 386. See also *CDNR*, 17–22/422–25; *VT*, 243. Harrison, "Bacon, Hobbes, and the Ancient Atomists," 199, objects that Bacon here takes Democritus to task for a mistake for which Lucretius is more properly to blame. But even if it be granted that Bacon failed at times to draw the requisite distinctions, Harrison fails to join the heterogeneity problem.

90. "Distributio operis," 38; *NO I* §66, 106; *NO II* §48, 382–416; §50, 440.

91. *DSV*, "Cupid, or the Atom" [of which *DPAO* is in some sense a revision], 655–56/730; also *NO I* §72, 116; *RP*, 564. As regards the possibility of the vacuum, Bacon is agnostic, so that atomism's falsity on this point (*NO II* §8, 212) must have to do with the reasons Leucippus and Democritus educe for it, for which see *NO II* §48, 414.

mense variety of individuals that he had rightly supposed there to be in nature.⁹² This shortcoming appears to derive in turn from what is in other respects his great virtue, namely, his penchant for dissecting nature, which in Bacon's analysis causes him to neglect the study of natural structures or wholes, whose constitution surely cannot be accounted for by percussive motion alone, as developments in physics in the twentieth century have shown time and again.⁹³ In sum, although the philosophy of Democritus is, by ancient standards, exemplary in its "savor" of "the nature of things, and experience, and bodies," his atoms represent yet another intemperate "flight" to the first and last things. Even the greatest of Bacon's Presocratics stumbles in a way that is also typical of his Socratics.

VI. CONCLUSION

As Socrates tells the story in the *Phaedo*, what made his philosophizing "Socratic" was not merely a personal preference for the study of moral and political life over "inquiry into nature." To the contrary, he informs his interlocutors on the day of his death that when he was younger, he was wondrously desirous of wisdom about the causes of the genesis and destruction of each thing, a wisdom that seemed to him to him something magnificent. He also acknowledges that in pursuing it he was even led to consult a writing of Anaxagoras on the subject. He goes on to explain, however, that difficulties he experienced along the way convinced him of the necessity of embarking upon a "second sailing," and from that day onward he took philosophically to the oars of dialectal conversation. He presents this change of orientation, which is of course what made him "Socratic," as a second-best, something *faute de mieux*, on account of its indirection; for by comparison, his "Presocratic" pursuit of the causes could be described as an attempt to gain knowing access to them immediately, simply by "looking at the beings," in thought or through the senses, it is hard to say which. The turnabout was nevertheless neces-

92. On Democritus's praiseworthy appreciation of nature's variety, see *Abecedarium novum naturae*, in *The Instauratio magna: Last Writings*, edited by Graham Rees, OFB XIII (2000), 217; TPM, 537.

93. NO I §66, 106; §57, 90 with §53, 88. On Democritus's inability to do justice to structures, see also *Descriptio globi intellectualis*, OFB VI, 116–18.

sary, he suggests, because his initial approach had the paradoxical effect of blinding him to the things nearest to hand, the things that until then he had supposed he knew well. Worse still, it was utterly incapable of elucidating the causality of the good, and thus of assessing the goodness of his inquiry, or of any other human activity. Nevertheless, the Platonic Socrates continued to pursue “the truth of the things that are” even after having taken “refuge in speeches.” His final word about himself surely does not compel us to conclude that he ever simply relinquished the study of nature.⁹⁴

Just as Socratic philosophizing emerges in contradistinction to the natural philosophy of those who could subsequently be classed as “pre-” Socratic, so the philosophy of Bacon must be understood in light of his quarrel with the Socratic tradition, particularly as actualized by the Aristotelian school. And it is in that same light, I have argued, that we should interpret Bacon’s efforts to retrieve something of the philosophy Socrates put behind him. It is not in order to restore the beginnings of Greek philosophy that Bacon returns to them, but in view of his intention to bring about a new beginning in philosophy, a beginning all his own. He looks back to Presocratic science so that we might see our way more clearly forward to his. What his Presocratics contribute to his cause, I have suggested, is a sense of possibility. In the most general sense, they serve him in his campaign to open his readers up to the possibility of philosophizing without deference to Aristotle. Stated more precisely, they function as pointers to the new mode and order of philosophizing that he envisages, which involves, among other things, a thoroughgoing reconsideration of the nature of the material world and of our relation to it. But notwithstanding his opposition to Socratic philosophy, the English thinker is also significantly in its debt, and the ways in which he diverges from the Presocratics helps to make this manifest. We might therefore characterize his new beginning, *sit venia verbo*, as a “third sailing.”

Like Socrates, then, Bacon rejects all characteristically “Presocratic” attempts to ascend directly from the visible appearances of the natural order to their cause or causes. To be sure, he also rejects the typically Socratic correction to that kind of inquiry, which takes as its fundamental

94. *Phaedo* 96a–102a together with 89c–91e. See also the very helpful discussion in Burger, *The Phaedo*, 135–60.

point of departure the way things show up in ordinary words and common opinions. And yet one could not for that reason justly describe Bacon as a misologist, for he too insists that to philosophize rightly requires a certain trust in *logos*, albeit the rigorously disciplined *logos* or “logic” set forth in his “organon.” Furthermore, the novel method of reasoning he outlines is itself the result of a critical examination, somewhat akin to Socratic *elenchus*, of the grounds of scientific inquiry in human nature. And at the heart of this reflection is for Bacon, as much as for Socrates, the question or problem of the good. In fact, “the greatest error” perpetrated by learned men to the discredit of “the dignitie of Learning” is, he says, “the mistaking or misplacing of the last or furthest end of knowledge.” It is precisely in the context of making this claim that he introduces what is undoubtedly the most distinctively Baconian element of his response to the Socratic question, namely, that natural science be put in the service of “the relief of man’s estate.”⁹⁵

Although I adverted to this doctrine at the outset, if I have not mentioned it again until now, this is in part because there is nothing in the writings of the Presocratics, such as they have come down to us, that might have contributed to its invention, and in part because Bacon does not explicitly mention it when his express concern is the legacy of early Greek philosophy. The Baconian doctrine of the “last or furthest end” of natural philosophy is nevertheless connected, I believe, to his account of early Greek philosophy in the following way. As we have seen, the eclipse of atomism in late antiquity is, on Bacon’s telling, a consequence of the obscurity of its doctrines, joined to its manifest or publicly visible theological shortcomings, which together render it unworthy of popular approbation. But as he observes in his *Magna Instauratio*, “howsoever varied may be the kinds of polity [or government], there is but one state of the sciences, and it has always been and will remain popular.”⁹⁶ The Socratically inspired natural philosophy of Plato and Aristotle may well be “lighter and less solid” than that of Leucippus and Democritus, but its survival is proof of its superior wisdom in at least one respect: it gives the rule of popular science its due. It is hard to avoid the conclusion that the technological science envisaged by Bacon is intended, by its broadly

95. See note 1 above.

96. *Preface*, 14; and *VT*, 227; with *NO I* §§90–91, 146–48.

democratic appeal, as a correction to the Presocratic failure to recognize the necessary, and in that sense natural, human limits within which natural science must operate, and upon which its advancement depends.⁹⁷ Doubts that have since occurred to us about the long-term viability, and even the goodness, of modern technological science would seem to prove how difficult it is either to sail or to row around or beyond Socrates.

97. See *CV*, 598–99: unless “deeper contemplations of nature” such as those of Democritus are “demonstrated and commended by evident and excellent use,” they will be “stirred and extinguished by the winds of vulgar opinion.”

10 ∞ Primal Truth, Errant Tradition, and Crisis

The Presocratics in Late Modernity

I

The thought on the Greeks in the work of Friedrich Nietzsche and Martin Heidegger has been the inspiration for much original and penetrating philosophic scholarship in the twentieth century. Assuming that Heidegger is the foremost re-thinker of Nietzsche's legacy (an assumption that needs to be tested), Nietzsche's writing and Heidegger's teaching and writing began a movement that now includes numbers too great to count. Certainly not all who might be named are philosophically Nietzschean or Heideggerian; they are, however, variously indebted to the new questioning of the tradition. The readings by Nietzsche and Heidegger of the early philosophers have not usually been at the center of this re-engagement with the Greeks, despite the fact that for these two thinkers the early philosophers and poets are the source of primordial wisdom from which the modern West must draw for self-renewal. But if one is to understand the roots of some leading recent approaches to the Greeks, including Plato and Aristotle, one must examine these readings. My aim is to consider in broad terms what these thinkers claim to find in the early philosophers and what philosophically motivates their quest. Due to limitations of space, I will not speak in detail on the interpretations of particular ancient figures, and I will also set aside all questions about the

This essay has appeared with the same title in Richard Velkley's book *Heidegger, Strauss, and the Premises of Philosophy: On Original Forgetting* (Chicago: University of Chicago Press, 2011).

scholarly accuracy of their interpretations. To consider the turn to the early philosophers in these two great thinkers is to uncover something fundamental about their philosophies, and thus about philosophy in the most recent period of modernity. Some light will be shed as well, necessarily, on the nature of modernity itself.

II

Among the notes collected after Nietzsche's death and published under the title *The Will to Power*, there is the following reflection on German philosophy, dated 1885 in the Musarion edition:

German philosophy as a whole—Leibniz, Kant, Hegel, Schopenhauer, to name the greatest—is the most fundamental form of *romanticism* and homesickness there has ever been: the longing for the best that has ever existed. One is no longer at home anywhere; at last one longs back for that place in which alone one can be at home: the *Greek* world! But it is precisely in that direction that all bridges are broken—except the rainbow-bridges of concepts!¹

Nietzsche surmises that perhaps in a few centuries the real dignity of German philosophy will be recognized for its “gradual reclamation of the soil of antiquity” and for its renewal of the bond with the Greeks, “the hitherto highest type of man.” He then concludes:

Today we are getting close to all those fundamental forms of world-interpretation devised by the Greek spirit through Anaximander, Heraclitus, Parmenides, Empedocles, Democritus, and Anaxagoras—we are growing more Greek by the day; at first, as is only fair, in concepts and evaluations, as Hellenizing ghosts, as it were: but one day, let us hope, also in our bodies! Herein lies (and has always lain) my hope for the German character!²

Nietzsche here describes German philosophy as a rebellion against modernity, against the Reformation in particular, and as a second Renaissance of antiquity. The recovery Nietzsche seeks is ambiguous, however, for the Greeks are only “the hitherto highest type of man.” The hope he places in the German character, whereby he implies he seeks another bridge beyond merely conceptual bridges, is to renew Greekness in mind and body, and

1. Nietzsche, *Werke* (henceforth *W*), III, 464–65, and *Will to Power* (henceforth *WP*), #419.

2. *WP*, #419.

thus to rectify a flaw in antiquity, an injustice that antiquity inflicted on itself. This was the wound inflicted on Greek culture by Socrates and his new kind of philosophizing. “The real philosophers of Greece are those before Socrates (—with Socrates something changes).”³ The early tragic culture of the Greeks succumbed to that wound, but a renewed tragic culture, based on a consciousness of all that has happened since the Greeks, and on a deeper understanding of the sources of mind and body in will, might endure, as incorporating the wound. Nietzsche’s German predecessors did not follow this path, as Leibniz, Kant, Hegel, and Schopenhauer were all avowed admirers of Socrates, and Nietzsche’s Hellenism rejects the Hellenism of classical German culture. Yet as efforts to address the soul’s homesickness, all German philosophic striving is concerned with the problem of evil. He points to this feature in another note: “The significance of German philosophy (Hegel): to evolve a pantheism through which evil, error and suffering are not felt as arguments against divinity.”⁴ The note contains this sentence: “I myself have attempted an *aesthetic* justification: how is the ugliness of the world possible?”

The shared project of the German philosophers, including Nietzsche (and Heidegger, as I will argue) could be summed up this way: Burdened with homesickness in modernity, or a sense of loss, they diagnose the ground of that loss and thereby transform the loss, so that it (the illness, wound, or ugliness) is preserved somehow, or justified, in the transformation. And yet, as justified, it is not simply overcome. The renewal of antiquity includes somehow the gulf, the abyss, that separates modernity from antiquity. Nietzsche says that he is the first to justify existence through a critique of morality:⁵ “I saw no one who had ventured a critique of moral value feelings.”⁶ He shows that ugliness, evil, and pain are inseparable from beauty, nobility, and health. Herein he opposes the whole post-Socratic tradition, including Kant and Hegel, who in different ways attempt to “prove the dominion of morality by means of history.” But “we no longer believe in morality, as they did, and consequently we have no need to found a philosophy with the aim of justifying morality.”⁷ Still, there is a sense in which those modern justifications of morality are built upon the undermining of older notions of the nature and supports of moral-

3. *W*, III, 765–67; *WP*, #437.

5. *W*, III, 756–58; *WP*, #428.

7. *W*, III, 479; *WP*, #415.

4. *W*, III, 496; *WP*, #416.

6. *W*, III, 486; *WP*, #410.

ity, such that they opened up an abyss (or exploited an already existing abyss) in freedom, in order to force reason or spirit to discover (or create) a new order in that abyss. In modernity before Kant and Hegel, ideas of freedom with abysmal potentials (such as Rousseau disclosed) emerged, pointing to the need for a synthesis of the ancient and the modern. Nietzsche rejects the classical German idealist syntheses, so that he does not start with the acceptance of freedom in its modern Enlightenment, democratic meaning, and he does not seek to reconcile it with post-Socratic rational morality. All the same, he offers another synthesis and another justification, in which the most extreme form of modern skepticism is one component and the turn to the early Greeks is another.

Nietzsche rejects the late antiquity of Socrates and Plato—thinkers who employed logic and dialectics as they “took up the cause of virtue and justice.”⁸ “Since Plato philosophy has been dominated by morality” due to his portrayal of Socrates, “who was a monomaniac with regard to morality,” tyrannizing over the instincts and the senses with his logic, producing the formula “reason = virtue = happiness,” but thereby only showing that “the Socratic disposition is a phenomenon of decadence.”⁹ “Philosophers are prejudiced against appearance, change, pain, death, the corporeal, the senses, fate and bondage, the aimless.”¹⁰ Nietzsche seems to include the early Greeks, but Heraclitus does not wholly fit the charge.¹¹ With the Socratics, philosophy is put on the path of finding a rational moral teleology of the whole, the search for “morality-in-itself” and the “good-in-itself.” The ancient sophistic culture, whose predecessors were Heraclitus and Democritus and whose highest expression is Thucydides, was in accord with “the Greek instincts” in rejecting this quest. It was a “remarkable moment” verging on the first critique of morality.¹² At the core of Nietzsche’s appreciation of the Greeks is his revival of non-Socratic moral pessimism: the absence (in the early philosophers and poets) or the rejection (in the sophists and Thucydides) of rational moral teleology. Of course this does not mean that for Nietzsche these thinkers lacked either nobility or reason. To the true nobility and the higher reason he gives the name “Dionysian wisdom.”¹³

8. *W*, III, 730; *WP*, #429.

9. *W*, III, 771–72; *WP*, #432.

10. *W*, III, 438; *WP*, #407.

11. *W*, II, 957–58 (*Götzen-Dämmerung*, “Die ‘Vernunft’ in der Philosophie,” 2).

12. *W*, III, 757; *WP*, #428.

13. *W*, III, 912; *WP*, #417.

III

In one of his last writings, *Ecce Homo*, Nietzsche says of his first book, *The Birth of Tragedy from the Spirit of Music*, that it put forth two decisive innovations: the account of the Dionysian phenomenon as a root of Greek art, and the understanding of Socrates as “an instrument of Greek disintegration,” the figure who embodies “‘rationality’ at any price as a dangerous force that undermines life.”¹⁴ The Dionysian is “the ultimate, most joyous, most wantonly extravagant Yes to life,” based on the insight that “nothing in existence may be subtracted, nothing is dispensable.” To clarify this he quotes his own *Twilight of the Idols*: “Saying Yes to life even in its strangest and hardest problems; the will to life rejoicing over its inexhaustibility even in the sacrifice of the very highest types—that is what I called Dionysian. Not in order to get rid of terror and pity . . . but in order to be oneself the eternal joy of becoming, beyond all terror and pity—that joy that includes even joy in destroying.”¹⁵ This points toward the “aesthetic justification” of existence: “I took the will to beauty, to persist in like forms, for a temporary means of preservation and recuperation: fundamentally, however, the eternally-creative appeared to me to be, as the eternal compulsion to destroy, associated with pain.”¹⁶ The will is not realized in created form itself (the Apollonian moment of art) but in the act of creating, for which form is but a vehicle. The creative will to life celebrated by the poets is its own *telos*. But in Nietzsche’s judgment, Socrates and Plato as moral teleologists seek a world in which life will be possible without change, destruction, and pain, and so they necessarily oppose the poets. There exists no truly Dionysian philosopher among the Greeks. “Before me this transposition of the Dionysian into a philosophic pathos did not exist; tragic wisdom was lacking.”¹⁷ Among philosophers, the thought of Heraclitus comes nearest to it: “The affirmation of passing away and destroying; saying Yes to opposition and war; becoming, along with the radical repudiation of the very concept of being.”¹⁸ The doctrine of eternal recurrence as taught by Zarathustra might have been taught already by Heraclitus, but surely in a different

14. *W*, II, 1109–10 (“Warum ich so gute Bücher Schreibe”).

15. *W*, II, 1110, citing *W*, II, 1032 (“Was ich den Alten Verdanke,” 5).

16. *W*, III, 496; *WP*, #416.

17. *W*, II, 1111.

18. *W*, II, 1111.

mode and for different ends.¹⁹ In a brief passage of *The Birth of Tragedy*, Heraclitus is described as the one philosopher having the aesthetic vision of the whole. Dionysian art “reveals to us the playful construction and destruction of the individual world as the overflow of a primordial delight. Thus the dark Heraclitus compares the world-building force to a playing child that places stones here and there and builds sand hills only to overthrow them again.”²⁰ Heraclitus transposes the Dionysian-poetic vision into philosophic concepts, but does so incompletely. One can surmise that Heraclitus lacks a concept of will to ground the cosmic activity of “world-building.” But no ancient thinker could have had that concept, nor the historical consciousness resulting from insight into the will’s powers of self-transformation.

Nietzsche remarks that he had to abandon hopes for the recovery of tragic culture by the Germans of his time through the inspiration of Wagner’s art, and that he “advanced further down the road of disintegration—where I found new sources of strength for individuals. We have to be destroyers!” In the state of general disintegration “individuals can perfect themselves as never before.”²¹ The decay of the old values has to be advanced, not held back, so that new values can replace them. Humanity is confronted with the greatest danger, the loss of all ability for higher willing with the collapse of the old values, but this danger affords rare higher human beings the opportunity to create new values and a new humanity. Such human beings do not yet exist: “I wish for a species of man that does not yet exist: for the ‘masters of the earth.’”²² That the human species has such power for willing into being a new species is a thought surely lacking in the Greeks. It has to be added that Nietzsche’s prophetic stance and his hopes for such transformation would not be possible without the examples of biblical revelation, which he in general opposes for their moral teachings. In paradoxical fashion, Dionysian wisdom combines affirmation of the world as it is—the rejection of any *telos* beyond the Now—with the hope of radical transformation of man. This apparent contradiction between affirming and transcending is present in the willing of the eternal recurrence, not as theoretical doctrine but as means for the will’s self-transformation. “To the paralyzing sense

19. W, II, 1111.

20. W, I, 131–32 (*Die Geburt der Tragödie*, sec. 24).

21. W, III, 912; WP, #417.

22. W, III, 432; WP, #958.

of general disintegration and incompleteness I opposed the *eternal recurrence*.²³ I restate that Nietzsche synthesizes the most extreme form of modern skepticism with the recovery of early Greek wisdom, and that this constitutes in his view not a mere fusing of doctrines but the deepest understanding of the beneficence of evil.

I will conclude this discussion of Nietzsche with remarks on the incomplete and unpublished book written soon after *The Birth of Tragedy*, entitled *Philosophy in the Tragic Age of the Greeks*. Two primary concerns of this writing are the individuality of philosophers and the relation of philosophers to their culture. Nietzsche says he is less concerned with the truth of the systems of the philosophers than with their individuality, the “incontrovertible and non-debatable” foundation of their thought in their unique personalities. The inquiry has a higher than merely scholarly aim: to bring to light great human beings whom we must love and honor.²⁴ But of course we cannot love and honor something unless we can see what is lovable and honorable in it, and the question must be asked whether what is lovable and honorable in the philosophers does not have some relation to the truth or at least nobility of what they sought. Nietzsche speaks of their capacity for wonderment at mundane life, which appears to them as a problem worthy of contemplation. Philosophy is a human possibility that transcends these particular individuals. But Nietzsche himself wonders not only at their wonderment, he wonders also at the Greek culture which was able to produce these great individuals without envy, with admiration for their qualities. Why did Greece have philosophers at the high point of its political and artistic flourishing? Most cultures have no inherent need of philosophy, and the philosopher arises as a mere accident in them. The early Greeks attained somehow a harmony between philosophy and the general culture; this marvel is what Nietzsche puts before the culture of his time, in hopes that it will be emulated. But there is a difficulty in this. Philosophy alone can never initiate a healthy culture, it can only be in accord with an already healthy culture by warding off dangers to its health. In this way early Greek philosophy was in accord with the tragic poetic culture.²⁵

23. W, III, 912; WP, #417.

24. W, III, 351–52 (*Die Philosophie im tragischen Zeitalter der Griechen*).

25. W, III, 353–54; cf. “Einführung” to Nietzsche’s *Die Vorplatonischen Philosophen* (henceforth VP), in *Nietzsche Werke*, Pt. 2, vol. 4.

But this unique harmony must be rooted in something that is uniquely Greek and that neither philosophy nor poetry could create. The theme of the individuality of the early philosophers, who establish various archetypes of philosophy, is mirrored in the individuality of Greek culture as a whole. How can radically unique beings serve as archetypes for others, when even they themselves do not grasp the conditions of their existence? This is a basic problem lurking in this essay.

In any case, the great age does not last. The great age is one of the highest reverence for individuals that are whole and complete, which is possible at the early stage of a culture before traditions appear that limit and stifle the powers of individuals. The greatness of the early thought is related to its being the first efforts at philosophic discovery, such that each discoverer finds his own way, and that way reflects his being and that of no one else. Hence the early thinkers are pure types, and the pure types include Socrates.²⁶ Interestingly, Nietzsche did not complete the treatise, which ends with Anaxagoras, and Socrates is mentioned only in passing. Starting with Plato, philosophers are mixed types, which means they rely on traditions of thought from which they select their own approaches, but also that they mix being philosophers with being founders of schools and sects. They are concerned with creating institutions to preserve and protect their activity, a sign that they are not in accord with their world. Philosophers become exiles, conspiring against their fatherlands. The homelessness of philosophy emerges at the very moment when philosophers become preoccupied with the ethical and political. Philosophers begin to seek laws that are different from the customs of their cities. Nietzsche does not mean that the early philosophers are popular thinkers, content to articulate prevailing customs and myths. On the contrary, they are solitary and proud, indifferent to public opinion and oracular in their speech. But admiration for this proud indifference was itself a trait of the culture. To refer to *The Birth of Tragedy*, one might say the early culture was not yet rationally moral, and followed an instinct-based custom that revered the great individual.

This bears directly on the relation of philosophy to tragic poetry. It is true that the early philosophers leave mythical thought behind, and they think in concepts rather than images.²⁷ But they are not simply em-

26. *W*, III, 358–60.

27. *VP*, “Einführung.”

pirical students of nature, and they are not solely logical in their thinking. They seek the ground and the unity of the whole, which are hidden from ordinary experiences. Extraordinary leaps of intuition are required to make their bold proposals about the ground and unity. This intuition brings them into relation to poetic intuitions about being, and also to the questions that the tragic poets raise about the value of existence, that is, whether individual beings have any right to be at all.²⁸ Tragic culture, as a whole, shares the belief that greatness exists in individuals, not the species, and is therefore fragile and transient, considered in light of the overpowering whole, which is indifferent to human wishes and human justice. Anaximander's vision is simply pessimistic, but Nietzsche claims that Heraclitus finds a way to affirm the transience. He rejects Anaximander's dualism of a fallen world of individual beings which need punishment for the injustice of simply existing, and of a ground into which they rightly return, by affirming the innocent play of becoming, of creation and destruction, as a contemplated spectacle.²⁹ Heraclitus is again closely related to the wisdom of the poets, in that he views the world as a work of art and identifies with the artist-god that produces it. As such he is both contemplator and actor, just as "the artist stands contemplatively above and at the same time actively within his work." It might be suggested that Nietzsche here points to a poetic mode of philosophizing that would resolve the problem of individuality and universal archetype. Individuality achieves a kind of universality not through knowledge of timeless essences but through a poetic producing that participates in the creative force behind the whole itself. Heraclitus prefigures Nietzsche's central thought, the justification of existence for and by the great individual through the doctrine of the will to power.

IV

Heidegger's intense engagement with the early Greeks comes after *Being and Time* (1927), in which work, as well as in his studies before 1927 as a whole, they play a less central role. Certainly Aristotle is from the start crucial to his phenomenological and ontological inquiry, and to a lesser

28. W, III, 367–69.

29. W, III, 376–84.

extent Plato. Let us remind ourselves that in *Being and Time* Heidegger seeks to recover the meaning of the question of Being, which he claims has been forgotten.³⁰ The phenomenological analysis of the average and everyday understanding of Being presupposed by human existence, or by the human way of being in the world, is only a preparation for recovering the question. The human has a special place among the beings in having a unique openness to Being, such that the capacity for questioning about Being belongs to its constitution. As such the human way of existing is the site or place for the disclosure of Being, and can be called Da-*Sein*, the “there (or here) of Being.” Heidegger insists his analysis is not concerned with anthropology but with ontology, and its aim is not to show how the human is there in Being, but how Being is there through the human. He also insists that Being is not a concept, genus, or causal ground, but the primordial disclosure of the world that makes accessible any thinking about beings, including any thinking with and about concepts, genera and causality. But although Being is the ground of disclosure for any engagement with beings, Being (*das Sein*) itself tends to be concealed, as human attention is focused on the being (*das Seiende*). That which is nearest and most pervasive, Being, is also what is most hidden.

The philosophic and scientific traditions have mostly overlooked Being and promoted its hiddenness, and thus the loosening and dismantling of layers of tradition about Being must be undertaken, the so-called *Destruktion* of tradition. This is not merely a negative undertaking, since in a hidden way Being sustains the Western philosophic tradition, and the *Destruktion* will reveal how Being is present even in its absence from explicit reflection. As early as Parmenides, the Greeks already display a tendency to think of Being in terms of worldly entities and to favor entities that are most present at hand, or enduringly present, in their accounts of Being or the world. Greek thinking has a twofold prejudice: with respect to time, it favors the present among the temporal *ecstases*, and with respect to *logos*, it favors assertoric judgment and the logical relations among such judgments. The full scope and power of time and *logos* for the unconcealment of Being, for primordial truth (*aletheia*), was not noticed or developed by the Greeks. The historical inquiry shows how these prejudices unfold from a Greek beginning, which has still

30. Heidegger, *Sein und Zeit*, 2–40 (“Einleitung”).

some appreciation of Being as disclosure or *aletheia*, into more extreme Being-forgetful forms in the modern subject-object distinction and the mathematical-technical approach to beings. Everywhere in the modern world, beings are the object of calculation and manipulation, and the ground of their disclosure is walled off from awareness. This entails that the human is lost to itself, unaware of its own essence.

It is well known that Heidegger did not complete the planned parts of *Being and Time*, and although his fundamental pursuit remained the same, namely, the recovery of the question of Being, his path toward it changed. This change is related to several obvious external features in Heidegger's later thought: the absence of the formal systematic approach of *Being and Time*, the new emphasis on certain figures (the early Greeks, Nietzsche, Hölderlin), on the themes of poetry, language and the gods, and also on nihilism and the technological night of the world. In all of these changes, Heidegger seeks a deeper account of the ground of the disclosure of Being and does so by turning to the history of Being, by which is not meant an historical account of Being, but Being itself as giving or sending a fate or destining (*Geschick*)—a way of disclosure which makes a claim on the human and to which the human must respond. In a relation of mutual dependence, Being appropriates the human, and the human in turn avows its belonging to Being. Being needs the human as the site of its disclosure, such that the human is the guardian and protector of Being, and conversely the human cannot be human without the relation to Being, which gives shelter to the human essence. The most developed account of this historical appropriation (*Ereignis*) by and of Being is found in the recently published *Contributions to Philosophy: From Enowning* of 1936–38.³¹ This cannot be my theme directly, although Heidegger's turn to the early Greeks is inseparable from these considerations, and I will necessarily refer to them without the full elaboration they require.

In the history of Being two moments are most decisive: the original opening to Being among the Greeks at the beginning (*Anfang*), in the first questioning about Being, which founds a destiny that carries forward Western history, and the present moment, that of oblivion to the

31. *Beiträge zur Philosophie (Vom Ereignis)*, in *Martin Heidegger: Gesamtausgabe* (henceforth *GA*), vol. 65.

question of Being, or nihilism, which completes the process of forgetting. Nietzsche's thought both fulfills and is a witness to the completion of Western metaphysics in nihilism, and understanding him is essential for pointing beyond the present oblivion to another beginning, a renewal of the opening to Being that also requires the most intense thinking about the first beginning. Heidegger offers some autobiographical illumination on his reaching this account. Soon after the end of the Second World War, writing on his Rectoral Address of 1933, Heidegger notes that in 1932 he found in Ernst Jünger's book *Der Arbeiter* "an essential understanding of Nietzsche's metaphysics, insofar as in the horizon of this metaphysics the history and the present of the West is seen and foreseen."³² Jünger exposed "the universal mastery of the will to power within the planetary scope of history." Heidegger then grasped that what Nietzsche meant by the "death of God" was that this actuality of the will to power follows the collapse of the "effective power in history of the supersensible world, especially the world of the Christian God." Thereupon he saw the need for "a reflection on the overcoming of the metaphysics of the will to power and a dialogue with the Western tradition from its beginning."³³ In this concise account, without evident irony, Heidegger claims that his rallying the university to support the National Socialist regime was for the sake of overcoming the very doctrine, the Will to Power, that the new regime, usurping Nietzsche's authority, used as a slogan.

Indeed, the Rectoral Address itself contains Heidegger's first published statement on the need for the return to the beginnings within the outlines of the history of Being, as an historical new beginning. He gave seminars on *The Beginning of Western Philosophy (Anaximander and Parmenides)* in summer 1932, and on Plato's allegory of the cave and *Theaetetus* in winter 1931–32, that initiate this return. In the Address he calls the German people to place themselves "under the power of the beginning of our spiritual-historical existence." He claims that in spite of our great remove from the beginning, "the beginning is itself in no way overcome or indeed annihilated. . . . The beginning *is* still. It lies not *behind us* as the long since departed, but it stands *before us*. . . . The beginning has entered our future, and stands there as the distant command, bid-

32. "Das Rektorat 1933/34," in *Die Selbstbehauptung der deutschen Universität. Das Rektorat 1933/34* (henceforth *SdU*), 24.

33. *SdU*, 25.

ding us to retrieve its greatness.”³⁴ Only by winning back the greatness of the beginning can “science (*Wissenschaft*) become the inner necessity of our existence.” With a reference to Nietzsche’s “death of God,” Heidegger seals the case that modern man’s “lostness among the beings” makes necessary the turn to the beginning. Surely at the time of this address Heidegger was hopeful about the capacity of the new regime to assist in this remarkable metaphysical undertaking, though his hopes were soon dashed. It is notable that there is some parallel to the hopes placed in Wagner by the youthful Nietzsche, which also vanished with more experience. And in each case one has the notion, coming after the disenchantment, that a further advance into the night of nihilism is necessary for the arrival of the new dawn. In the hopeful time of summer 1933, in lectures entitled *The Basic Questions of Philosophy*, Heidegger restates the claim about the enduring beginning that awaits our response to its challenge, using language that has a central place in his thought thereafter: “The essence of the beginning turns itself about (*kehrt sich um*); it is no longer the great anticipatory origin, but the incomplete, probing beginning of the future development.”³⁵ The first beginning in the Greeks points us toward a second beginning, and this pointing is not merely a human event, but it occurs within the beginning itself, in its turning about. The turning all the same calls for human response in order to be fulfilled. This is one of many indications that the *Kehre*, the much debated turning of the later Heidegger’s thought, is not just a change or turning in Heidegger’s way of thinking.

Although sometime after 1934 Heidegger abandons expectations or hopes of a politically led renewal of the beginnings, and calls instead for reflective listening and awaiting for an arrival prepared by our thinking, there is a sense in which his conception remains more hopeful than the mature Nietzsche’s. In Nietzsche one finds no claim that the great beginning continues to govern covertly the unfolding of history, and no parallel to statements like this one of Heidegger: “The primordial disclosure of Being as a whole, the question concerning beings as such, and the beginning of Western history are the same.”³⁶ Nietzsche exhorts the philosophers of the future to assume extraordinary responsibility, but he

34. *Ibid.*, 12–13.

35. *Die Grundfragen der Philosophie*, in *Sein und Wahrheit*, GA, vol. 36/37, 11.

36. “Vom Wesen der Wahrheit,” in *Wegmarken*, 85.

admits it is a role that is not prepared by earlier philosophy. Nietzsche, through his account of Socrates and Plato, shows that philosophy can have dire consequences but not that it has ever alone founded a great culture, much less that it has been the hidden governing force of all Western history that brings itself and the human toward a second beginning. As his short book on the early philosophers shows, the harmony of those philosophers with their culture (which Nietzsche, one may say, is overstating) was a brief moment in the otherwise precarious relation of philosophic individuals to their culture. The prominence of the philosophic life as a theme in Nietzsche relates to his stress on Socrates, to whom Nietzsche is the profoundly kindred antipode, whereas Heidegger's near total silence on Socrates reflects his neglect of that theme. One could say that Nietzsche's justification of existence for and by great individuals is replaced by Heidegger's justification of the human essence as the erring-revealing site of the truth of Being, a justification for and by Being.

Clearly there is some kinship between Nietzsche's attack on the moral-teleological thinking of the Socratics and Heidegger's account of the Platonic stage of the forgetting of Being. For both Nietzsche and Heidegger, the attempt to ground human ethics and justice in the whole commits an obscuring of the truth about the whole; hence, their justifications of existence are supra-ethical. Heidegger in the early 1930s³⁷ seeks to uncover the manner in which Plato ambiguously retains a relation to primordial *aletheia* while he also obscures it. In Plato "the coming into presence (*Anwesenung*) is no longer, as in the beginning of Western thinking, the emerging of the hidden into unconcealment," since Plato conceives coming into presence as *idea*. The *idea* is not merely "the foreground of unconcealment (*aletheia*) but is rather the ground of its possibility."³⁸ Under the subordination of the *idea*, "truth is no longer the fundamental feature of Being itself but becomes correctness, henceforth the decisive mark of the knowing of beings." Through the highest of *ideas*, the Good, the ground of the existing and appearing of all beings, Plato makes the human and its place among the beings the dominant concern of metaphysics.³⁹ Yet

37. He does so in the Plato seminar mentioned and in a related essay, "Plato's Doctrine of Truth," published in 1942 in a revised version. See *Wegmarken*, 109–44 ("Platons Lehre von der Wahrheit").

38. *Wegmarken*, 139–40 ("Platons Lehre von der Wahrheit").

39. *Ibid.*, 141.

this turning to humanism is not merely a human event. “Plato’s thinking follows a turning in the essence of truth itself (*Wandel des Wesens der Wahrheit*), which turning becomes a turning in the history of metaphysics that in Nietzsche’s thinking has begun its unconditioned completion.”⁴⁰ Nietzsche’s thought is the completion of Platonic metaphysics, not its overcoming, since his conception of philosophy as the highest will to power takes the elevation of the human (albeit supra-ethical) to its most extreme point.⁴¹ Even so, Heidegger also writes that the demand for reflection on the Greek beginnings would be “arbitrary and presumptuous” without two figures, Hölderlin and Nietzsche, “who knew the beginnings more primordially than all ages before them, and only for the reason that they experienced for the first time the end of the West, and furthermore: even in their existence and work they *became ends . . .*” This was possible for them only because “they were overpowered by the beginning and were elevated to greatness. Both these moments, reflection on the first beginning and founding an end that is fitting to it and its greatness, belong together in the turning (*Kehre*).”⁴² In seeing the end, seeing the beginning in the light of the end, and seeking a new beginning, Nietzsche was unfolding a fate he did not recognize, one leading beyond his self-conception as well as his interpretation of the beginnings. All the same, his errors were not mere failures but the inevitable limitations of thinking greatly in the grip of the higher power of Being.

V

In this last section on Heidegger, I want to consider further the way in which experience of the end in the time of metaphysics’ completion is crucial to recovery of the beginning and preparing for another beginning. Heidegger should not be understood as claiming that the beginning was the primordial disclosure of Being whose brilliance is required to illuminate the darkness of modern nihilism. In that case, the beginning would simply belong to the past, as something lost and now to be regained. Rather, the beginning is self-concealing essentially and from

40. *Ibid.*, 142.

41. Nietzsche, *W*, 895–96; *WP*, #617; cited by Heidegger in *Holzwege* (henceforth *H*), 306: “To stamp becoming with the character of being—that is the *highest will to power*.”

42. *GA*, vol. 45, 126 (*Grundfragen der Philosophie*, 1937/38 lectures).

the start, and its power in the unfolding in Western history lies precisely in self-concealment. Hence the darkness of the forgetting of Being is a darkness belonging to the beginning itself and unfolding as the concealment of Being in Western history. In this way the age of the technological night of the world can offer an unprecedented illumination of the difference between Being and beings, for those who are able to think profoundly and primordially. Accordingly, in such thinking the Greek beginning receives an illumination that was unavailable to the early thinkers. One could say Heidegger offers a justification of erring as the forgetting of Being that recalls Nietzsche's statement about the significance of German philosophy as the justification of evil, error, and suffering. No predecessor of Heidegger, however, spoke in terms of the truth of Being as the emerging of the hidden into unconcealment. Heidegger restates in such terms the Nietzschean claim that the darkness of nihilism is inherently full of promise. Heidegger often quotes the lines of Hölderlin, "But where danger is, grows / The saving power also."⁴³ The uncovering of the saving power requires a dual movement of thought, back to the first beginning (which is also the movement of the beginning toward the present) and forward to the other beginning.

Heidegger provides a rich and fascinating account of this structure of thinking in his essay "The Saying of Anaximander," written in 1946.⁴⁴ Heidegger dismisses the prevailing understanding of the early Greeks as the precursors of Plato and Aristotle, as rudimentary students of *phusei onta* groping toward the Aristotelian *Physics*, which has dominated since Theophrastus. Nietzsche himself employs superficial traditional categories of Being and Becoming in his readings.⁴⁵ The categories modern scholars use in describing the fragment of Anaximander, such as physical, ethical, rational, and philosophical, are absurd, since physics, ethics, rationalism, and philosophy did not yet exist.⁴⁶ Our disciplinary boundaries and categories must be set aside. We have the problem of interpreting an utterance which is separated from us by an immense gulf, and of transposing our thinking in a modern language into the ancient Greek. Can we make the earliest saying speak to us?⁴⁷ Concealed in the chrono-

43. Heidegger, *Vorträge und Aufsätze*, 32 ("Die Frage nach der Technik"; henceforth *FT*).

44. *H*, 296–343.

45. *Ibid.*, 297–99; *GA*, vol. 51, 105 (*Grundbegriffe*, 1941 lectures).

46. *H*, 305; *GA*, vol. 51, 99.

47. *GA*, vol. 51, 123.

logical remoteness there may be a “historical proximity to the unspoken, an unspoken which will speak out in that which is coming.”⁴⁸ Perhaps the modern West is journeying into the earth’s evening, into an *Abendland* that transcends the European, which may be the place of another dawn. The once (*Einst*) of the first dawn may overtake the once of the latest dawn (the *eschaton*), in the departure of the long-concealed destiny of Being. “As destining, Being is inherently eschatological.”⁴⁹ If we think out of the eschatology of Being, and ponder the beginning that is approaching, we may be drawn to listen and to have dialogue with the early Greeks. In that dialogue, we can speak of the same Being, though it will be addressed from out of the different.⁵⁰ Our success will not be measured in terms of accuracy in the portrayal of “what was really present in the past.” The question is whether in the dialogue “that which wishes to come to language. . . . comes of its own accord.” Being is, in different ways, destined to concern both the Greeks and us. But a fundamental trait of Being is to be more concealed than revealed, at all times. “By revealing itself in the being (*das Seiende*), Being (*das Sein*) withdraws.”⁵¹

Being as withdrawing endows beings with errancy, such that beings necessarily misinterpret the essential. This realm of misinterpretation is history. Errancy is not a human failing, since the self-misunderstanding of humans corresponds to the self-concealing of the illumination (*Lichtung*) of Being. Without errancy the human would have no relation to its destiny. Chronological distance from the Greeks is one thing, but historical distance is something else, and in that regard we are near to them. We are close to Being’s primordial refusal, to Being’s keeping its truth to itself even as it discloses beings. Being’s keeping to itself is the *epochê* of Being, which sense of *epochê* Heidegger distinguishes from Husserl’s methodical setting aside of thetic consciousness. Being’s *epochê* or holding back of its truth is the grounding of worlds, which are the epochs of errancy. This now for Heidegger is the more fundamental meaning of time: “The epochal essence of Being belongs to the concealed temporal character of Being,” in which the ecstatic time of *Dasein* is grounded. Indeed, the epochal essence appropriates (*ereignet*) the ecstatic essence of *Dasein*.⁵² Already at the dawn of thinking about Being, the essence

48. *H*, 300.50. *Ibid.*, 307.52. *Ibid.*, 311–12.49. *Ibid.*, 300–302.51. *Ibid.*, 310.

of Being as the presencing of beings keeps to itself, and so the difference between Being and the beings themselves, the things that are present, remains concealed. The two are disclosed, the one as ground and the other as grounded, yet the ground comes forward as the highest being, so the difference is extinguished. "The destining of Being begins with the oblivion of Being," although the earliest thought in an unspoken way shows the trace (*Spur*) of the difference, more than does later thought. (Heidegger points above all to the double sense of the genitive in Anaximander's phrase, *kata to chreon*.) The difference appears although not named as such.⁵³ Again, the oblivion is not a deficiency (*Mangel*); it is the event or appropriation (*Ereignis*) of metaphysics, the richest and broadest event in world history. We still stand in the shadow of this event, of this destining, and thus are granted the possibility of being mindful of Being's destining.⁵⁴ Later accounts of Being in terms of *idea*, *energeia*, *substantia*, and objectivity may deepen the oblivion, but they do not thereby annul the destiny. On the contrary, they fulfill it by pointing to the need for reflection on the destiny itself. In that reflection the human becomes the guardian of Being's concealing itself, of its holding back its truth so that errant humans can be historical. The human realizes then the gift of Being that happens in errancy itself. Reflecting on the saving power in danger, thinking becomes questioning, which is the piety of thought.⁵⁵

VI

What cannot be ignored in these late modern readings of the early Greeks? First, the importance of thinking about the history of philosophy itself is made evident in them. Philosophizing addresses certain subjects, but it cannot consist only in addressing them directly, through our own thought and experience. It must include addressing questions to the philosophers themselves, to deepen the grasp of what philosophy itself is; otherwise, proceeding on our own will be naïve and narrow. At the heart of philosophy is reflection on the relation of the whole of Being to the ordinary things of experience, a relation that remains elusive and never

53. Cf. Heidegger, *Einführung in die Metaphysik*, 111, 145–46.

54. *H*, 336.

55. *FT*, 40.

wholly determined. By simply reflecting, as careful phenomenologists, on our own experiences, we will not come upon all the ways that the relation might be conceived. In sum, entering into the debate about the fundamental relation, the heart of philosophy, seems to depend in a crucial way on the existence of a tradition of thinking. Yet, of course, there were the first philosophers.

This brings me to the second item. Nietzsche and Heidegger remind us that philosophy cannot evade the fundamental questions about the ground and the unity of Being, and that the early philosophers may offer deep insight into these questions. What is more, they remind us that traditions have a tendency to conceal their origins, and thus they raise the possibility that the beginning of the tradition may possess thoughts that deserve to stand on their own, and should not be considered only as a "first sailing." The Platonic-Aristotelian account of them as "first sailing" is already placing the first thinkers in a light that is alien to them. On the other hand, Nietzsche and Heidegger note that it is impossible to forget that the early thinkers did begin a tradition, one developing thoughts and concerns not in their sights, such that certain possibilities latent in the early thought may be hidden to or barely grasped by its authors. In this regard, the later tradition may in fact provide new disclosures about the beginning.

This brings up the third item. Both thinkers draw attention to tradition itself, as a ground and condition of thinking, and as having positive and negative import for thinking. They are moved to focus on this theme because in their time the very existence of the tradition of philosophy has become problematic. The crisis in the tradition brings attention to its singularity and fragility. Philosophy as directed toward the whole and the universal is still, qua tradition, something singular, having a unique temporal reality. It is mysterious that this activity, philosophy, has a singular beginning in certain times and places, and that it unfolds where, when, and how it does, as a tradition. It is also astounding to consider that this tradition might wholly disappear from the earth at some time. Nietzsche and Heidegger think that these mysteries cannot be separated from the wonder of philosophy itself. Heidegger claims that this singularity is the gift and the destiny of the questioning of Being, the gift and destiny that affords dignity to human existence, so that when all other grounds of worth have fallen into nothingness, this alone stands out

more purely than ever, as providing human beings with a mission.⁵⁶ One may question whether these two thinkers have gained genuine insights into fate and history, and also question whether they have appropriate estimations of the end and dignity of human life. Yet when all this has been properly regarded as questionable, something quite appropriate and essential for philosophy has been gained: some questions worthy of being asked.

56. GA, vol. 70, 140–42 (*Über den Anfang*).

Bibliography

- Algra, Keimpe. "The Beginnings of Cosmology." In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long.
- . *Concepts of Space in Greek Thought*. Leiden: E. J. Brill, 1995.
- Allen, R. E., and D. J. Furley. *Studies in Presocratic Philosophy*. Vol. 1, *The Beginnings of Philosophy*, and Vol. 2, *Eleatics and Pluralists*. Vol. 1, New York: Humanities Press, 1970; Vol. 2, London: Routledge and Kegan Paul, 1975.
- Aristotle. *Complete Works of Aristotle*. 2 vols. *The Revised Oxford Translation*. Edited by J. Barnes. Princeton: Princeton University Press, 1984.
- . *Metaphysics*. Translated by Richard Hope. Ann Arbor, MI: Ann Arbor Paperbacks, 1960.
- . *Physics*. Translated by Richard Hope. Lincoln, NE: University of Nebraska Press, 1961.
- Bacon, Francis. *The Oxford Francis Bacon*, vol. IV. Edited by Michael Kiernan. Oxford: Clarendon Press, 2000.
- . *The Oxford Francis Bacon*, vol. VI. Edited by Michael Kiernan. Oxford: Clarendon Press, 1996.
- . *The Oxford Francis Bacon*, vol. XI. Edited by Graham Rees. Oxford: Clarendon Press, 2004.
- . *The Oxford Francis Bacon*, vol. XV. Edited by Michael Kiernan. Oxford: Clarendon Press, 2000.
- . *The Works of Francis Bacon*. 14 vols. Edited by J. Spedding, R. L. Ellis, and D. D. Heath. London: Longman and Co., 1857–74.
- Ballow, Lynne. *Straight and Circular: A Study of Imagery in Greek Philosophy*. Assen, The Netherlands: Van Gorcum, 1979.
- Barnes, Jonathan. *Early Greek Philosophy*. 2nd ed. New York: Penguin Books, 2001.
- . "The Presocratics in Context." *Phronesis* 33 (1988): 327–44.
- , ed. *The Complete Works of Aristotle: The Revised Oxford Translation*. 2 vols. Princeton: Princeton University Press, 1984.
- . *The Presocratic Philosophers*. Revised ed. London: Routledge & Kegan Paul, 1981.
- Benardete, Seth. *The Argument of the Action: Essays on Greek Poetry and Philosophy*. Edited and with an introduction by Ronna Burger and Michael Davis. Chicago: University of Chicago Press, 2000.
- Bicknell, P. J. Review of *Matter and Infinity in the Presocratic Schools and Plato*, by T. G. Sinnige. *Journal of Hellenic Studies* 90 (1970): 240–41.

- . “A Note on Xenophanes’ Astrophysics.” *Acta Classica* 10 (1967): 135–36.
- Bodár, István, and William W. Fortenbaugh, eds. *Eudemus of Rhodes*. New Brunswick, NJ: Transaction Publishers, 2002.
- Bollack, Jean. *Parménide: De l’Étant au Monde*. Lagrasse, France: Verdier, 2006.
- Boudouris, K. J., ed. *Ionian Philosophy*. Athens: International Association for Greek Philosophy, 1989.
- Bowen, A. C. *Science and Philosophy in Classical Greece*. New York and London: Garland, 1991.
- Bremmer, J. “Rationalization and Disenchantment in Ancient Greece: Max Weber among the Pythagoreans and Orphics?” In *From Myth to Reason? Studies in the Development of Greek Thought*, edited by R. Buxton. Oxford: Oxford University Press, 1999: 71–83.
- Broadie, Sarah. “Rational Theology.” In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 204–24.
- Burger, Ronna. *The Phaedo: A Platonic Labyrinth*. New Haven: Yale University Press, 1984.
- Burkert, W. “The Logic of Cosmogony.” In *From Myth to Reason? Studies in the Development of Greek Thought*, edited by R. Buxton. Oxford: Oxford University Press, 1999: 87–106.
- . *Ancient Mystery Cults*. Cambridge, MA: Harvard University Press, 1987.
- . *Lore and Science in Early Pythagoreanism*. Translated by E. L. Minar, Jr. Cambridge, MA: Harvard University Press, 1972; original German edition, 1962.
- Burnet, John. *Early Greek Philosophy*. 4th ed. London: McMillan, 1930; reprint ed. Cleveland: World Publishing, 1957.
- Buxton, R. *From Myth to Reason? Studies in the Development of Greek Thought*. Oxford: Oxford University Press, 1999.
- Bywater, I., and G. T. W. Patrick. *Heraclitus of Ephesus*. An edition combining in one volume: *The Fragments of the Work of Heraclitus of Ephesus On Nature*. Translated with introduction and critical notes by G. T. W. Patrick. And *Heracliti Ephesii Reliquiae*. Edited by I. Bywater with an introduction and select bibliography by Lewis A. Richards. Chicago: Argonaut Inc., 1969.
- Caston, V., and D. Graham, eds. *Presocratic Philosophy: Essays in Honour of A. P. D. Mourelatos*. Aldershot, UK: Ashgate Publishing Co., 2002.
- Chantraine, Pierre. *Dictionnaire étymologique de la langue grecque*. Paris: Éditions Klincksiek, 1968.
- Cherniss, H. F. “The Characteristics and Effects of Presocratic Philosophy.” In *Studies in Presocratic Philosophy*. Vol. 1, *The Beginnings of Philosophy*, edited by David J. Furley and R. E. Allen. New York: Humanities Press, 1970: 1–28. Reprinted from *Journal of the History of Ideas* 12 (1951): 319–45.
- . *Aristotle’s Criticism of Presocratic Philosophy*. Baltimore: Johns Hopkins University Press, 1935.
- Colodny, Robert, ed. *Frontiers of Science and Philosophy*. Pittsburgh: University of Pittsburgh Press, 1962.
- Cordero, Néstor-Luis, ed. *Proceedings of the International Symposium: Parmenides, Venerable and Awesome*. Las Vegas, NV: Parmenides Publishing, 2011.

- . *By Being, It Is: The Thesis of Parmenides*. Las Vegas: Parmenides Publishing, 2004.
- . “La Version de Joseph Scaliger du poème de Parménide.” *Hermes* 110 (1982): 391–8.
- Cornford, F. M. *Principium Sapientiae: A Study of the Origins of Greek Philosophical Thought*. Edited by W. K. C. Guthrie. New York: Harper & Row Publishers, 1965.
- . *From Religion to Philosophy: A Study in the Origins of Western Speculation*. New York: Harper and Row, 1957.
- Corrigan, K., and S. Stern-Gillet, eds. *Reading Ancient Texts, Volume I: Presocratics and Plato. Essays in Honour of Denis O’ Brien*. Leiden: E. J. Brill, 2007.
- Couprie, Dirk. “The Discovery of Space: Anaximander’s Astronomy.” In *Anaximander in Context: New Studies in the Origins of Greek Philosophy*, edited by Dirk L. Couprie, Robert Hahn, and Gerard Naddaf. Albany: State University of New York Press, 2003.
- Couprie, Dirk L., Robert Hahn, and Gerard Naddaf, eds. *Anaximander in Context: New Studies in the Origins of Greek Philosophy*. Albany: State University of New York Press, 2003.
- Crane, T., and D. H. Mellor. “There Is No Question of Physicalism.” *Mind* 99 (1990): 185–206.
- Curd, Patricia. *Anaxagoras of Clazomenae: Fragments and Testimonia*. Toronto: University of Toronto Press, 2007.
- . “Divinity, Intelligibility, and Human Understanding in Presocratic Thought.” Invited paper presented to the Chicago Area Consortium in Ancient Greek Philosophy Conference: Religion and Philosophy in Classical Thought. November 2006.
- . “On the Question of Religion and Natural Philosophy in Empedocles.” In *The Empedoclean Kosmos: Structure, Process and the Question of Cyclicity*, edited by A. Pierris. Patras, Greece: Institute for Philosophical Research, 2005: 137–62.
- . *The Legacy of Parmenides: Eleatic Monism and Later Presocratic Thought*. Princeton, NJ: Princeton University Press, 1998; reprinted Las Vegas, NV: Parmenides Publishing, 2004.
- . “A New Empedocles? Implications of the Strasburg Fragments for Presocratics Philosophy.” *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 17 (2002): 27–49.
- . “The Metaphysics of Physics: Mixture and Separation in Empedocles and Anaxagoras.” In *Presocratic Philosophy: Essays in Honor of A. P. D. Mourelatos*, edited by V. Caston and D. Graham. Aldershot, UK: Ashgate Publishing Co., 2002: 139–58.
- . “Knowledge and Unity in Heraclitus.” *Monist* 74 (1991) 531–49.
- Curd, Patricia, and Daniel W. Graham, eds. *The Oxford Guide to Presocratic Philosophy*. Oxford and New York: Oxford University Press, 2008.
- Delatte, A. *Études sur la Littérature Pythagoricienne*. Paris: Champion, 1915.
- De Maistre, Joseph. *An Examination of the Philosophy of Bacon, Wherein Dif-*

- ferent Questions of Rational Philosophy are Treated.* Translated by Richard A. Lebrun. Montreal: McGill-Queen's University Press, 1998.
- Denniston, J. D. *The Greek Particles.* Oxford: Clarendon Press, 1978.
- deVries, Willem A. "Wilfrid Sellars." *The Stanford Encyclopedia of Philosophy* (Fall 2011 ed.), Edward N. Zalta, ed. <http://plato.stanford.edu/archives/fall2011/entries/sellars>.
- . *Wilfrid Sellars.* Chesham, Bucks: Acumen, 2005.
- Dicks, D. R. *Early Greek Astronomy.* London: Thames & Hudson, 1970; reprint ed Ithaca: Cornell University Press, 1985.
- Diehl, Ernestus, ed. *Anthologia Lyrica Graeca.* Bibliotheca scriptorium Graecorum et Romanorum Teuberiana. Leipzig: Tuebner, 1949.
- Diels, H. *Die Fragmente der Vorsokratiker.* 1st ed. Berlin, 1903.
- . *Doxographi Graeci.* 4th ed. Berlin, 1879; reprinted Berlin: de Gruyter, 1965.
- Diels, H., and W. Kranz, eds. *Die Fragmente der Vorsokratiker.* 6th ed. Berlin: Weidmann, 1952; 12th ed. Zurich: Weidmann, 1966.
- Dilcher, Roman. *Studies in Heraclitus.* Hildesheim, Germany: Georg Olms, 1995.
- Eddington, A. S. *The Nature of the Physical World.* Whitefish, MT: Kessinger Publishing, 2005.
- Everson, S., ed. *Companions to Ancient Thought, 1: Epistemology.* Cambridge: Cambridge University Press, 1990.
- Fink, Eugen, and Martin Heidegger. *Heraclitus Seminar 1966/67.* Tuscaloosa: University of Alabama Press, 1979.
- Finkelberg, Aryeh. "Anaximander's Conception of the *apeiron*." *Phronesis* 38 (1993): 229–56.
- Fränkel, Hermann. "Xenophanes' Empiricism and His Critique of Knowledge (B 34)." In A. P. D. Mourelatos, *The Pre-Socratics.* Garden City, NY: Anchor Press, 1974, 118–31. Translated by M. R. Cosgrove from "Xenophanesstudien," *Hermes* 60 (1925): 174–92.
- Frede, M., ed. *Essays in Ancient Philosophy.* Minneapolis: University of Minnesota Press, 1987.
- . "Individuals in Aristotle." In *Essays in Ancient Philosophy*, edited by M. Frede. Minneapolis: University of Minnesota Press, 1987:49–71.
- Freeman, Kathleen. *Ancilla to the Presocratic Philosophers.* Oxford: Blackwell, 1956.
- Furley, D. *The Greek Cosmologists: Volume I: The Formation of the Atomic Theory and Its Earliest Critics.* Cambridge: Cambridge University Press, 1987.
- Gadamer, H. G. *The Beginning of Knowledge.* New York: Continuum, 2002.
- Gatty, Harold. *Nature is Your Guide: How to Find Your Way on Land and Sea.* Harmondsworth, Middlesex: Penguin Books, 1979.
- Gill, M. L., and P. Pellegrin, eds. *A Companion to Ancient Philosophy.* Malden, MA: Blackwell Publishing, 2006.
- Gilson, Etienne. *God and Philosophy.* 2nd ed. New Haven, CT: Yale University Press, 2002.
- . *Unity of Philosophical Experience.* San Francisco: Ignatius Press, 1999.

- Gottschalk, H. B. "Anaximander's *Apeiron*." *Phronesis* 10 (1965): 37–53.
- Graham, Daniel W. *Explaining the Cosmos: The Ionian Tradition of Scientific Philosophy*. Princeton: Princeton University Press, 2006.
- . "The Topology and Dynamics of Empedocles' Cycle." In *The Empedoclean Kosmos: Structure, Process and the Question of Cyclicity*, edited by A. Pierris. Patras, Greece: Institute for Philosophical Research, 2005: 225–44.
- . "Was Anaxagoras a Reductionist?" *Ancient Philosophy* 24 (2004): 1–18.
- . "A New Look at Anaximenes." *History of Philosophy Quarterly* 20 (2003): 1–20.
- . "La lumière de la lune dans la pensée grecque archaïque." Translated by Létitia Mouze in *Qu'est-ce que la philosophie présocratique?* edited by André Laks and Claire Louguet. Villeneuve d'Ascq, France: Presses Universitaires du Septentrion, 2002: 351–80.
- . "Empedocles and Anaxagoras: Responses to Parmenides." In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 159–80.
- . "The Postulates of Anaxagoras." *Apeiron* 27 (1994): 77–121.
- Graham, Daniel W., and Eric Hintz. "Anaxagoras and the Solar Eclipse of 478 BC." *Apeiron* 40 (2007): 319–44.
- Gulley, Norman. "The Pre-Socratics on Infinity." Review of *Matter and Infinity in the Presocratic Schools and Plato*, by Theo Gerard Sinnige. *Classical Review*, n.s., 20 (1970): 26–27.
- Guthrie, W. K. C. *A History of Greek Philosophy*. Cambridge: Cambridge University Press; vol. I, 1962; vol. II, 1965.
- Hahn, Robert. *Anaximander and the Architects: The Contributions of Egyptian and Greek Architectural Technologies to the Origins of Greek Philosophy*. Albany: State University of New York Press, 2001.
- Hamlyn, D. W. Review of *Matter and Infinity in the Presocratic Schools and Plato*, by Theo Gerard Sinnige. *Philosophical Quarterly* 19 (1969): 280.
- Harrison, Charles T. "Bacon, Hobbes, and the Ancient Atomists." *Harvard Studies and Notes in Philology* 12 (1930): 191–218.
- Heidegger, M. *Sein und Zeit*. Tübingen: Max Niemeyer Verlag, 2006.
- . *Gesamtausgabe*. Vol. 65. Frankfurt a. M.: Klostermann, 1989.
- . *Die Selbstbehauptung der deutschen Universität. Das Rektorat 1933/34*. Frankfurt a. M.: Klostermann, 1983.
- . *Wegmarken*. Frankfurt a. M.: Klostermann, 1967.
- . *Einführung in die Metaphysik*. Zweite Auflage. Tübingen: Max Niemeyer, 1957.
- . *Vorträge und Aufsätze*. Pfullingen: Neske, 1954.
- . *Einführung in die Metaphysik*. Tübingen: Max Niemeyer, 1953.
- . *Holzwege*. Frankfurt a. M.: Klostermann, 1950.
- Heitsch, Ernst. "Das Wissen des Xenophanes." *Rheinisches Museum für Philologie* 109 (1966): 193–235.
- Herodotus. *History*. Vol. 1. Translated by A. D. Godley. Cambridge, MA: Harvard University Press, 1926.
- Huffman, Carl A. "Heraclitus' Critique of Pythagoras' Enquiry in Fragment 129." *Oxford Studies in Ancient Philosophy* 35 (2008): 19–47.

- . “Philolaus and the Central Fire.” In *Reading Ancient Texts*, Volume I: *Presocratics and Plato, Essays in Honour of Denis O’Brien*, edited by K. Corrigan and S. Stern-Gillet. Leiden: E. J. Brill, 2007: 57–94.
- . *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King*. Cambridge: Cambridge University Press, 2005.
- . *Philolaus of Croton: Pythagorean and Presocratic*. Cambridge: Cambridge University Press, 1993.
- Hussey, Edward. “The Beginnings of Greek Science and Philosophy.” In *A Companion to Ancient Philosophy*, edited by M. L. Gill and P. Pellegrin. Malden, MA: Blackwell Publishing, 2006.
- . “Heraclitus.” In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 88–112.
- . “The Beginnings of Epistemology.” In *Companions to Ancient Thought*. 1: *Epistemology*, edited by S. Everson. Cambridge: Cambridge University Press, 1990.
- Ierodiakonou, K. “Empedocles on Colour and Colour Vision.” *Oxford Studies in Ancient Philosophy* 29 (2005): 1–37.
- Inwood, Brad. *The Poem of Empedocles: A Text and Translation with an Introduction*. Toronto: The University of Toronto Press, 1992.
- Jacoby, Felix. *Die Fragmente der Griechischen Historiker*. Erster Teil. Leiden: E. J. Brill, 1968.
- Jaeger, Werner. *The Theology of the Early Greek Philosophers*. Translated by Edward S. Robinson. Oxford: Clarendon Press, 1947.
- Kahn, Charles H. “Religion and Natural Philosophy in Empedocles’ Doctrine of the Soul.” In *The Pre-Socratics*, edited by A. P. D. Mourelatos. Garden City, NY: Doubleday, 1974. Reprinted Princeton: Princeton University Press, 1993: 426–56.
- . “Some Remarks on the Origins of Greek Science and Philosophy.” In *Science and Philosophy in Classical Greece*, edited by A. C. Bowen. New York and London: Garland, 1991: 1–10.
- . *The Thought and Art of Heraclitus*. Cambridge: Cambridge University Press, 1979.
- . *Anaximander and the Origins of Greek Cosmology*. New York & London: Columbia University Press, 1960; reprinted Philadelphia: Centrum, 1985; reprinted Indianapolis: Hackett Publishing Co., 1994.
- Kennington, Richard. *On Modern Origins: Essays in Early Modern Philosophy*. Edited by Pamela Kraus and Frank Hunt. Lanham, MD: Lexington Books, 2004.
- Kerferd, George B. “Anaxagoras and the Concept of Matter before Aristotle.” *Bulletin of the John Rylands Library* 52 (1969): 129–43. Reprinted in A. P. D. Mourelatos, ed. *The Presocratics: A Collection of Critical Essays*. Garden City, NY: Anchor, 1974: 489–503.
- Kiernan, Michael, ed. *The Advancement of Learning*. Vol. IV of *The Oxford Francis Bacon*. Oxford: Clarendon Press, 2000.
- , ed. *The Essayes or Counsels, Civill and Morall Essayes*. Vol. XV of *The Oxford Francis Bacon*. Oxford: Clarendon Press, 2000.

- Kingsley, P. "Empedocles for the New Millennium." *Ancient Philosophy* 22 (2002): 333–413.
- . *Ancient Philosophy, Mystery, and Magic: Empedocles and Pythagorean Tradition*. Oxford: Clarendon Press, 1995.
- Kirk, G. S. *Heraclitus: The Cosmic Fragments*. Cambridge: Cambridge University Press, 1954.
- Kirk, G. S., and J. E. Raven. *The Presocratic Philosophers*. 1st ed. Cambridge: Cambridge University Press, 1957.
- Kirk, G. S., J. E. Raven, and M. Schofield. *The Presocratic Philosophers*. 2nd ed. Cambridge: Cambridge University Press, 1983.
- Laks, André. "Reading the Readings." In *Presocratic: Essays in Honor of A. P. D. Mourelatos*, edited by V. Caston and D. Graham. Aldershot, UK: Ashgate Publishing Co., 2002: 127–37.
- Laks, André, and Claire Louguet, eds. *Qu'est-ce que la philosophie présocratique?* Villeneuve d'Ascq, France: Presses Universitaires du Septentrion, 2002.
- Laporte, Paul M. "Attic Vase Painting and Pre-Socratic Philosophy." *Journal of Aesthetics and Art Criticism* 6 (1947): 139–52.
- Leshner, James. "Mind's Knowledge and Powers of Control in Anaxagoras DK B12." *Phronesis* 40 (1995): 125–42.
- . *Xenophanes of Colophon-Fragments: Text and Translation with Notes and Commentary*. Vol. IV: *Phoenix Series on the Presocratics*. Toronto: University of Toronto Press, 1992.
- Liddell, H. G., and R. Scott. *A Greek-English Lexicon*. Revised by H. S. Jones. Oxford: Clarendon Press, 1940; with a supplement, 1968; revised ed., 1996.
- Lloyd, Geoffrey, and Nate Siven. *The Way and the Word: Science and Medicine in Early China and Greece*. New Haven, CT: Yale University Press, 2002.
- Long, A. A., ed. *The Cambridge Companion to Early Greek Philosophy*. Cambridge: Cambridge University Press, 1999.
- . "Parmenides on Thinking Being." *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 12 (1996): 125–51.
- Mann, W. R. *The Discovery of Things: Aristotle's Categories and Their Context*. Princeton: Princeton University Press, 2000.
- Mansfeld, Jaap. *Studies in the Historiography of Greek Philosophy*. Assen, The Netherlands: Van Gorcum, 1990.
- . "The Chronology of Anaxagoras' Athenian Period and the Date of His Trial." Parts I and II. *Mnemosyne*, 4th ser. 32 (1979): 39–69; 33 (1980): 17–95. Reprinted in abridged form in J. Mansfeld, *Studies in the Historiography of Greek Philosophy*. Assen, The Netherlands: Van Gorcum, 1990: 264–306.
- Marcovich, M. *Heraclitus*. Merida, Venezuela: Los Andes University Press, 1967.
- Martin, A., and O. Primavesi, *L'Empédocle de Strasbourg*. Berlin: Walter de Gruyter, 1999.
- McKirahan, Richard. "Signs and Arguments in Parmenides B8." In *The Oxford Handbook of Presocratic Philosophy*, edited by P. Curd and D. Graham. New York: Oxford University Press, 2008: 189–229.
- . "Zeno." In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 134–58.

- . *Philosophy Before Socrates*. Indianapolis: Hackett, 1994.
- Minar, Edwin L. Review of *Matter and Infinity in the Presocratic Schools and Plato*, by Theo Gerard Sinnige. *American Classical Review* 2 (1972): 54–55.
- Moravcsik, Julius. “Appearance and Reality in Heraclitus’ Philosophy.” *Monist* 74 (1991): 551–67.
- Morris, I., and B. Powell. *The Greeks: History, Culture and Society*. Upper Saddle River, NJ: Prentice Hall, 2006.
- Mourelatos, A. P. D. “‘The Light of Day by Night’: *nukti phaos*, Said of the Moon in Parmenides B14.” In *Presocratics and Plato: A Festschrift in Honor of Charles Kahn*, edited by Richard Patterson, Vassilis Karasmanis, and Arnold Hermann. Las Vegas, NV: Parmenides Publishing, 2012, 55–88.
- . “Parmenides, Early Greek Astronomy, and Modern Scientific Realism.” In *Parmenides, Venerable and Awesome: Proceedings of the International Symposium*, edited by Néstor-Luis Cordero. Las Vegas, NV: Parmenides Publishing, 2011: 167–89.
- . “The Cloud-Astrophysics of Xenophanes and Ionian Materialism,” in *The Oxford Handbook of Presocratic Philosophy*, edited by P. Curd and D. Graham. New York: Oxford University Press, 2008, 134–68.
- . *The Route of Parmenides*. 1st ed. New Haven: Yale University Press, 1970; 2nd ed. Revised and expanded with a new introduction, three supplemental essays, and an essay by Gregory Vlastos. Las Vegas, NV: Parmenides Publishing, 2008.
- . “La Terre et les étoiles dans la cosmologie de Xénophane” [Earth and Stars in the Cosmology of Xenophanes; translated by C. Louguet]. In *Qu’est ce que la philosophie présocratique?* edited by A. Laks and C. Louguet. Ville-neuve d’Ascq, France: Presses Universitaires du Septentrion, 2002: 331–50.
- . “Xenophanes’ Contribution to the Explanation of the Moon’s Light,” *Philosophia* (Athens) 32 (2002): 47–59.
- . “Parmenides and the Pluralists.” *Apeiron* 32 (1999): 117–29.
- . “The Deceptive Words of Parmenides’ ‘Doxa.’” In *The Pre-Socratics: A Collection of Critical Essays*. Modern Studies in Philosophy. Garden City, NY: Doubleday and Company, 1974; second printing with revised introduction and bibliography, Princeton: Princeton University Press, 1993: 312–49.
- , ed. *The Pre-Socratics: A Collection of Critical Essays*. Modern Studies in Philosophy. Garden City, NY: Doubleday and Company, 1974; second printing, with revised introduction and bibliography. Princeton: Princeton University Press, 1993.
- . “X Is Really Y’: Ionian Origins of a Thought Pattern.” In *Ionian Philosophy*, edited by K. J. Boudouris. Athens: International Association for Greek Philosophy, 1989: 280–90.
- . “Quality, Structure, and Emergence in Later Presocratic Philosophy.” *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 2 (1987): 127–94.
- Murray, Gilbert. “Francis McDonald Cornford: 1874–1943” [obituary notice]. *Proceedings of the British Academy* 29 (1943): 421–32.

- Nietzsche, Friedrich. *Philosophy in the Tragic Age of the Greeks*. Washington, DC: Regnery Books, 1996.
- . *Nietzsche Werke*. Edited by G. Colli and M. Montinari. Berlin: de Gruyter, 1995.
- . *Werke in drei Bänden*. Edited by K. Schlechta. Munich: Hanser, 1966.
- . *The Will to Power*. Translated by W. Kaufmann. New York: Random House, 1967.
- Nussbaum, Martha. "ΨΥXH in Heraclitus, I and II." *Phronesis* 17 (1972): 1–16; 153–70.
- O'Brien, Denis. "Empedocles Revisited." *Ancient Philosophy* 15 (1995): 403–70.
- . *Empedocles' Cosmic Cycle*. Cambridge: Cambridge University Press, 1969.
- . Review of *Matter and Infinity in the Presocratic Schools and Plato*, by Theo Gerard Sinnige. *British Journal of the Philosophy of Science* 20 (1969): 161–67.
- . "The Relation of Anaxagoras and Empedocles." *Journal of Hellenic Studies* 88 (1968): 93–113.
- O'Grady, Patricia F. *Thales of Miletus: The Beginnings of Western Science and Philosophy*. Aldershot, UK: Ashgate Publishing, 2002.
- Onians, R. B. *The Origins of European Thought about the Body, the Mind, the Soul, the World, Time, and Fate: New Interpretations of Greek, Roman, and Kindred Evidence of Some Basic Jewish and Christian Beliefs*. Cambridge: Cambridge University Press, 1951.
- Osborne, Catherine. "Sin and Moral Responsibility in Empedocles's Cosmic Cycle." In *The Empedoclean Kosmos: Structure, Process and the Question of Cyclicity*, edited by A. Pierris. Patras, Greece: Institute for Philosophical Research, 2005: 283–308.
- . "Rummaging in the Recycling Bins of Upper Egypt: A Discussion of A. Martin and O. Primavesi, *L'Empédocle de Strasbourg*." *Oxford Studies in Ancient Philosophy* 18 (2000): 329–56.
- . "Empedocles Recycled." *Classical Quarterly* 37 (1987): 24–50.
- . *Rethinking Early Greek Philosophy: Hippolytus of Rome and the Presocratics*. Ithaca, NY: Cornell University Press, 1987.
- O'Shea, James R. *Wilfrid Sellars*. Cambridge: Polity Press, 2007.
- Palmer, John. "On the Alleged Incorporeality of What Is in Melissus." *Ancient Philosophy* 23 (2003): 1–10.
- . "Xenophanes' Ouranian God in the Fourth Century." *Oxford Studies in Ancient Philosophy*: (1998): 1–34.
- Panchenko, Dmitri. "Eudemos Fr. 145 Wehrli and the Ancient Theories of Lunar Light." In *Eudemus of Rhodes*, edited by István Bodár and William W. Fortenbaugh. New Brunswick, NJ: Transaction Publishers, 2002: 323–36.
- Patterson, Richard, Vassilis Karasmanis, and Arnold Hermann, eds. *Pre-socratics and Plato: A Festschrift in Honor of Charles Kahn*. Las Vegas, NV: Parmenides Publishing, 2012.
- Pierris, A., ed. *The Empedoclean Kosmos: Structure, Process and the Question of Cyclicity*. Patras, Greece: Institute for Philosophical Research, 2005.

- Plato. *Parmenides*. Translated by Albert Keith Whitaker. Newburyport, MA: Focus Publishing, R. Pullins Co., 1996.
- Plutarch. *Moralia*. Translated by F. C. Babbitt. Whitefish, MT: Kessinger Publishing, 2005.
- Popper, Karl. *The World of Parmenides: Essays on the Presocratic Enlightenment*. Edited by Arne F. Petersen and Jørgen Mejer. London and New York: Routledge, 1998.
- Poussin, Jean-Marie. "La notion baconienne de principe dans les *De principiis*." *Nouvelles de la république des lettres* 1 (2001): 105–20.
- Pritzl, Kurt. "Opinions as Appearances: *Endoxa* in Aristotle." *Ancient Philosophy* 14 (1994): 41–50.
- Raven, J. E. "The Basis of Anaxagoras' Cosmology." *Classical Quarterly*, n.s., 4 (1954): 123–37.
- Rees, Graham. "Atomism and 'Subtlety' in Francis Bacon's Philosophy." *Annals of Science* 37 (1980): 549–71.
- Reinhardt, Karl. "Heraclitea." *Hermes* 77 (1942): 225–48.
- Renehan, R. "On the Greek Origins of the Concepts Incorporeality and Immateriality." *Greek, Roman and Byzantine Studies* 21 (1980): 105–38.
- . "The Meaning of ΣΩΜΑ in Homer." *California Studies in Classical Antiquity* 12 (1980): 269–82.
- Rescher, Nicholas. *Cosmos and Cognition: Studies in Greek Philosophy*. Heusenstamm bei Frankfurt: Ontos Verlag, 2005.
- Rethy, Robert. "Heraclitus, Fragment 56: The Deceptiveness of the Apparent." *Ancient Philosophy* 7 (1987): 1–7.
- Riedweg, C. *Pythagoras: His Life, Teaching, and Influence*. Ithaca: Cornell University Press, 2005.
- Ritter, Heinrich. *Geschichte der Philosophie*. Vol. I. Hamburg: F. Perthes, 1829.
- Robinson, Richard. *Plato's Earlier Dialectic*. Oxford: Clarendon Press, 1953.
- Robinson, T. M. *Heraclitus*. Toronto: University of Toronto Press, 1987.
- Rose, Valentin, ed. *Aristotelis Fragmenta*. 3rd ed. Leipzig: Teubner, 1886.
- Ryan, E. G. "Pure Form in Aristotle." *Phronesis* 18 (1973): 209–24.
- Schindler, D. C. "The Community of the One and the Many: Heraclitus on Reason." *Inquiry* 46 (2003): 413–48.
- Sedley, D. *Creationism and Its Critics in Antiquity*. Berkeley: University of California Press, 2007.
- . "Empedocles' Life Cycles." In *The Empedoclean Kosmos: Structure, Process and the Question of Cyclicity*, edited by A. Pierris. Patras: Institute for Philosophical Research, 2005: 331–72.
- . "Parmenides and Melissus." In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 113–33.
- . "Two Conceptions of a Vacuum." *Phronesis* 27 (1982): 175–93.
- Seibt, Johanna. *Wilfrid Sellars*. Paderborn: Mentis, 2007.
- Sellars, Wilfrid. *Science, Perception and Reality*. London: Routledge & Kegan Paul/New York: Humanities Press, 1963. Republished by Ridgeview Publishing Company, 1991.
- . "The Scientific Image of Man." In *Frontiers of Science and Philosophy*,

- edited by Robert Colodny. Pittsburgh: University of Pittsburgh Press, 1962: 35–78. Reprinted in *Science, Perception and Reality*. London, 1963. Republished by Ridgeview Publishing Company, 1991.
- . *Science and Metaphysics: Variations on Kantian Themes*. London: Routledge & Kegan Paul/New York: Humanities Press, 1968.
- Sider, D. *The Fragments of Anaxagoras: Edited with an Introduction and Commentary*. 2nd ed. Sankt Augustin, Germany: Academia Verlag, 2005.
- Silverman, A. “Timaeon Particulars.” *Classical Quarterly*, n.s., 42 (1992): 87–113.
- Sinnige, Theo Gerard. *Matter and Infinity in the Presocratic Schools and Plato*. 2nd ed. Assen, The Netherlands: Van Gorcum and Company, 1968.
- Snell, Bruno. *The Discovery of the Mind in Greek Philosophy and Literature*. New York: Dover Publications, 1982.
- Strauss, Leo. *On Plato’s Symposium*. Edited with a foreword by Seth Benardete. Chicago: University of Chicago Press, 2001.
- Taylor, A. E. “On the Date of the Trial of Anaxagoras.” *Classical Quarterly* 11 (1917): 81–87.
- Taylor, C. C. W. “The Atomists.” In *The Cambridge Companion to Early Greek Philosophy*, edited by A. A. Long, 181–204.
- Trépanier, S. “Empedocles on the Ultimate Symmetry of the World.” *Oxford Studies in Ancient Philosophy* 25 (2003): 1–57.
- Velkley, Richard. *Heidegger, Strauss, and the Premises of Philosophy: On Original Forgetting*. Chicago: University of Chicago Press, 2011.
- Vlastos, Gregory. *Plato’s Universe*. Seattle: University of Washington Press, 1975; reprinted Las Vegas, NV: Parmenides Publishing, 2005.
- . “On Heraclitus.” *American Journal of Philology* 76 (1955): 337–68.
- Warren, J. *Presocratics*. Stocksfield, UK: Acumen, 2007.
- Waugh, Joanne. “Heraclitus: The Postmodern Presocratic?” *Monist* 74 (1991): 605–23.
- Wehrli, F. *Die Schule des Aristoteles*. Vol. 8, *Eudemus von Rhodos*. 2nd ed. Basel: Schwabe, 1969; 1st ed., 1955.
- West, M. L. *Early Greek Philosophy and the Orient*. Oxford: Oxford University Press, 1971.
- White, Stephen. “Thales and the Stars.” In *Presocratic Philosophy*, edited by Victor Caston and Daniel W. Graham. Aldershot, UK: Ashgate Publishing Co., 2002, 3–18.
- Wilcox, Joel. “Barbarian Psyche in Heraclitus.” *Monist* 74 (1991): 624–37.
- Wöhrle, Georg. “Wer entdeckte die Quelle des Mondlichts?” *Hermes* 123 (1995): 244–47.
- Woodbury, Leonard E. Review of *The Presocratic Philosophers: A Critical History with a Selection of Texts*, by G. S. Kirk, J. E. Raven, and Malcolm Schofield. 2nd ed. *Échos du monde classique*, n.s., 5 (1986): 75–77.
- . “Anaxagoras and Athens.” *Phoenix* 35 (1981): 295–315.
- Wright, M. R. *Empedocles: The Extant Fragments*. New Haven, CT: Yale University Press, 1981.

Contributors

PATRICIA CURD is professor of philosophy at Purdue University. She is the author of *The Legacy of Parmenides: Eleatic Monism and Later Presocratic Thought*; *Anaxagoras of Clazomenae: Fragments; Text and Translation with Notes and Essays*, part of the Phoenix Presocratics series; and co-editor (with Daniel Graham) of *The Oxford Handbook of Presocratic Philosophy*. Her current project is a study of divinity, intelligibility, and human thought in the Presocratics.

KENNETH DORTER is a professor of philosophy at the University of Guelph and has published extensively on the history of philosophy, including three books on Plato: *Plato's Phaedo: An Interpretation*; *Form and Good in Plato's Eleatic Dialogues: The Parmenides, Theaetetus, Sophist, and Statesman*; and *The Transformation of Plato's Republic*. His essay on Parmenides, "Appearance and Reality in Parmenides," is published electronically in *Metaphysics*, edited by Mark Pestana.

DANIEL W. GRAHAM is A. O. Smoot Professor of Philosophy at Brigham Young University and president of the International Association for Presocratic Studies. He is the author of *Explaining the Cosmos: The Ionian Tradition of Scientific Philosophy*, and author, editor, or translator of five earlier volumes on ancient philosophy. He has recently co-edited *The Oxford Handbook of Presocratic Philosophy* with Patricia Curd, and he has a two-volume, bilingual edition of the Presocratic philosophers, *The Texts of Early Greek Philosophy*, from Cambridge University Press.

CARL A. HUFFMAN is professor of classical studies at DePauw University in Greencastle, Indiana. His two books were both published by Cambridge University Press: *Philolaus of Croton: Pythagorean and Presocratic* and *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King*. He has published numerous articles and chapters on the Presocratics and

Pythagoreans and has contributed the articles on the Pythagoreans to the *Stanford Encyclopedia of Philosophy* (online). He has received fellowships from the John Simon Guggenheim Foundation, the National Endowment for the Humanities, and the Howard Foundation. He was a visitor at the Institute for Advanced Study in Princeton.

CHARLES KAHN is professor of philosophy at the University of Pennsylvania. He is the author of *Anaximander and the Origins of Greek Cosmology*; *The Verb "Be" in Ancient Greek*; *The Art and Thought of Heraclitus*; *Plato and the Socratic Dialogue*; and *Pythagoras and the Pythagoreans*.

J. H. LESHER is professor of philosophy at the University of North Carolina at Chapel Hill. He is the author of *Xenophanes of Colophon*; *The Greek Philosophers: Greek Texts with Notes and Commentary*; *Plato's Symposium: Issues in Interpretation and Reception*, with Debra Nails and Frisbee Sheffield; and "Essays on Aristotle's Posterior Analytics: Papers from the 2009 Duke-UNC Conference" (a special edition of the journal *Apeiron*). He is also the author or more than sixty articles on topics relating to ancient Greek philosophy.

JOHN C. MCCARTHY is dean of the School of Philosophy and associate professor at the Catholic University of America. In addition to publications on Descartes, Pascal, and reductionism in modern natural science, he has written on Augustine, Aquinas, and Husserl. He edited the volume of lectures *Modern Enlightenment and the Rule of Reason*.

ALEXANDER P. D. MOURELATOS is professor of philosophy and classics at the University of Texas at Austin, where he founded and for twenty-five years directed the Joint Classics-Philosophy Graduate Program in Ancient Philosophy. His publications span the fields of classics, philosophy, history of science, and linguistics, with early Greek philosophy (sixth to fifth centuries B.C.) as his dominant concern. Recipient of an honorary doctorate in his native Greece (University of Athens, 1994), he was in 2000 made corresponding member of the Academy of Athens, the highest academic honor for expatriate Greeks.

KURT PRITZL, OP, was dean of the School of Philosophy and associate professor at the Catholic University of America until his passing in 2011.

He specialized in ancient Greek philosophy and the theory of knowledge. He published articles on early Greek philosophy, on dialectic and received opinion in Plato and Aristotle, and on Aristotle's cognitional theory and account of the soul. He also published on the role of philosophy in the intellectual and spiritual formation of seminary students.

RICHARD VELKLEY is the Celia Scott Weatherhead Distinguished Professor of Philosophy at Tulane University. He is the author of *Freedom and the End of Reason: On the Moral Foundation of Kant's Critical Philosophy* and *Being after Rousseau: Philosophy and Culture in Question*, and the editor of Dieter Henrich, *The Unity of Reason: Essays on Kant's Philosophy*. He taught at the Catholic University of America 1997–2007 and was associate editor of *The Review of Metaphysics* 1997–2006.

Index of Sources

- Aelian**
Varia Historia
 4.17: 62
- Aeschylus**
 fr. 300 N: 153n14
Suppliants
 86–92: 78n4
 96–103: 78n4
 497: 153n14
 561: 153n14
Seven against Thebes
 39–41: 85n16
 66–68: 85n16
- Aetius**
Aetii Placita
 II 7.7: 68n31, 70
 II 13.5: 152n12
 II 30.1: 70
 III 11.3: 68n31
- Alcmaeon [24]**
 B1: 88
- Anaxagoras [59]**
 A2: 151
 A42: 103n25
 A77: 71
 A92: 137n49
 B1: xxivn28
 B4: xxivn28
 B12: 79, 89n22
 B13: 56
 B17: 123
 B42: 151
- Anaximander [12]**
 A5: 27
 A10: 30n41
- A15: 28
 B1: 21, 23, 25, 34
 B2: 26
 B3: 26
- Anaximenes [13]**
 A5: 25, 56
- Anonymous**
Homeric Hymns to Hermes
 201–11: 85n16
- Aristotle**
 fr. 191 [Rose3]: 59
 fr. 201 [Rose3]: 71
 fr. 204 [Rose3]: 75
De Anima
 A.2.404b8–15: 137
 Γ.3.428b3–4: 38n6
De Caelo
 A.3.270b1–24: 172n41
 B.13.293a20: 72
 B.13.293a22–23: 74
 B.13.293b3: 75
 Γ.5.303b12–13: 28
De generatione et corruptione
 A.2.315a35–b2: 180n71
 B.3.330b19: 22n25
Magna Moralia
 A.1.1182a11: 59n10
Metaphysics
 A.3.983b6–7: 117
 A.3.983b17–23: xv n8
 A.3.984a11–12: xxiiin26
 A.3.984b8–22: 146n7
 A.4.985a10–21: 146n7
 A.4.985a18–23: xxiiin27
 A.4.985b1–3: xxii n25
- A.4.985b4–20: xxviii n36
 A.5.985b23: 68n31
 A.5.986a6–12: 73
 A.5.986a22–26: 31n44
 A.5.986a29: 59n10
 A.5.986b18: xix n18
 A.5.986b27–28: 77n2
 A.6.987b1–2: 171n38
 A.7: xxviii n35
 A.8: xxviii n35
 A.8.988b21–22: xxviii n35
 A.8.990a1–2: xv n9
 Γ.4.1000a18–19: xxxn40
 Γ.4.1000a5–1001a1:
 xxxn40
 Γ.5.1010a12–15: 44n19
 Λ.6: 167n26
 N.4.1078b18: 171n38
 N.4.1078b20–21: 180n71
- Nicomachean Ethics*
 H.1.1145b3–8: 172n41
 K.7.1177b26–27: 40n1²
- Parts of Animals*
 A.1.642a28–30: 171n38
- Physics*
 A.1.184a16–20: 173
 A.1.184a17–b13: 172
 A.2.184b21: xxxn41
 A.6.189a11–14: xxxn41
 Γ.4.203a20: xxxn41
 Γ.4.203b11: 28
 Γ.4.203b11–12: 28
 Γ.4.203b13: 26
 Δ.10.218a31–b1: 33n56
 Θ.3.253b10–15: 44n18
- Posterior Analytics*
 A.2.71b32–72a6: 173n45
 B.1: 155n15

- Aristotle, *Posterior Analytics* (cont.)**
 B.2: 155n15
 B.8: 155n15
 B.11.94b32–34: 65
 B.11.94b33: 62
 B19: 172n41
- Rhetoric**
 B.23.1398b14: 59n10
 Γ.5.1407b16–17: 37n3
- Topics**
 A.1.100b21–23: 172n41
- Capella, Martianus**
De nuptiis
 6.590: 148n8
 6.592: 148n8
- Cicero**
Academica
 I.iv.15–16: 169n28
De natura deorum
 1.23.65–26.73: 176n55
 1.42.120: 176n55
 2.30.76: 176n55
De oratore
 III.16: 163n16
 III.19: 163n16
Satires
 x.48–50: 179n67
Tusculan Disputations
 V.iv.10: 169n27
- Democritus [68]**
 A86: 71
 B9: 11
 B125: 11
- Diogenes Laertius**
Lives and Opinions of Eminent Philosophers
 II.7: 140n1
 8.34: 61
 IX.21–22: 103n24
 IX.38: 175n51
 XIII: 58n9
- Empedocles [31]**
 A37: 132n39
 A86: 137
 A92: 137
 B2: 133
- B17: 124, 126
 B17.14–26: 125
 B17.19–20: 113, 126
 B17.25: 113
 B17.27–28: 131
 B17.54–59: 135
 B20: 134
 B21: 114, 125, 127, 131
 B21.7–8: 125
 B23: 130
 B26.3–7: 128
 B30: 134
 B33: 129, 130
 B34: 131
 B35: 113, 126, 132
 B35.3–6: 135
 B35.3–17: 134
 B35.6: 132
 B36: 113, 134
 B42: 151
 B53: 132
 B71: 129–30
 B73: 113, 131
 B85: 131
 B86: 131
 B87: 131
 B95: 131n35
 B96: 129, 131
 B98: 113, 131n36, 132
 B109: 137–38
 B109.3: 137
 B138: 124n28
- Eudemus**
 fr.145 [Wehrli]: 149n9
 fr. 146 [Wehrli]: 71
- Euripides**
Heracles
 1340–47: 78n4
 1341–46: 82
Hippolytus
 189–97: 78n4
Iphigeneia at Tauris
 387–91: 78n4
Philoctetes
 fr. 794: 78n4
- Hecataeus**
 fr. 1 [Jacoby]: 6
- Heraclitus [22]**
 A6: 44
 B1: 6, 36n1, 37, 39n9, 41, 45–46, 48–49
 B2: 41–42, 43n16, 49
 B3: 38
 B4: 39n9, 40, 46
 B5: 41n13
 B8: 39, 51
 B9: 39n9, 40, 46
 B10: 39, 42, 48, 51n31
 B11: 52
 B12: 44n18
 B13: 46
 B15: 41n13
 B16: 45
 B17: 38
 B18: 38, 43
 B21: 41n13, 44n18
 B22: 46
 B23: 45, 52
 B25: 41n13
 B26: 41n13
 B28: 49
 B29: 49
 B30: xxvñ31, 2, 42–43
 B32: 40, 44, 84
 B35: 46
 B36: 115
 B37: 46
 B40: 46, 49, 115
 B41: 38–39, 46n23, 48–49
 B42: 49
 B44: 53
 B45: 6, 41n13, 45, 49, 115
 B48: 41n13
 B49a: 44n18, 45
 B50: 39, 43, 45, 48
 B51: 50
 B52: 39
 B53: 51
 B54: 51
 B56: 38n6, 49
 B57: 47, 49
 B58: 52
 B59: 50
 B60: 40, 47
 B61: 39n9, 40
 B62: 48
 B64: xxvñ31, 36n1, 52n34

- B66: 42n15
 B67: 39n9, 47–48
 B69: 47n25
 B70: 49
 B72: 37
 B73: 41n13
 B75: 41n13, 50
 B76a: 46n23
 B78: 40, 46, 49
 B79: 50n30
 B80: 51
 B84a: 40
 B85: 115
 B86: 38
 B88: 41n13, 47
 B89: 40, 41n13
 B90: xxv, 42n15
 B91: 44n18
 B93: 44
 B94: 48
 B97: 40, 46
 B99: 38
 B100: 48
 B101: 45
 B101a: 43
 B102: 39, 48
 B103: 47
 B104: 49
 B106: 39n9, 40, 48
 B107: 46
 B108: 39, 48
 B110: 40, 54
 B111: 52
 B112: 49
 B113: 42, 43n16, 49,
 115
 B114: 41, 53
 B115: 45, 49, 115
 B116: 45
 B118: 159
 B119: 50
 B121: 49
 B123: 37
 B124: 39, 50
 B125: 52
 B126: 47
 B129: 49
 B133: 49n28
 fr. 43 [Bywater]: 51
- Herodotus**
History
 II, 20–22: 153n13
 II, 44: 85n16
- Hesiod**
Theogony
 49: 83
 121–22: 55
 131–32: 55
 173–85: 55
 482–83: 66
 534: 83n11
 548: 84n10
 687–735: 65
- Hippolytus**
Refutation of All Heresies
 I.6.1: 26
 I.8.6–10: 150
- Homer**
Iliad
 I, 530: 83
 II, 350: 83n10
 II, 412: 83n10
 IV, 515: 83n11
 VII, 226–27: 85n15
 VIII, 443: 83
Odyssey
 III, 378: 83n11
 V, 4: 83n10
- Iamblichus**
De vita Pythagorica
 82: 62
 82–86: 61
 83–84: 61
 84: 59
Protrepticus
 124.1: 59
- Parmenides [28]**
 A1: 103n24
 A40a: 97
 A42: 98
 B1.29: 29
 B1.30: xxn22, 94, 111
 B1.31: 105
 B1.31–32: 107
 B3: 115
 B6.5: 106
- B6.9: 106
 B7: 29
 B8: 14, 106, 112, 120
 B8.9–10: 127
 B8.42–44: xxn21, 72
 B8.42–49: 120
 B8.52: 8, 93, 111
 B8.53: 106
 B8.60–61: 110
 B8.61: 8
 B10: 91
 B10.2: 95n9
 B10.2–3: 95
 B10.3: 92, 94–95
 B12: 56, 123n24
 B14: 8n6, 91, 98–99,
 100n19, 101–2
 B15: 8n6, 91, 98–102
- Philolaus [44]**
 A16: 70
 A19: 75n40
 A20: 70
 A27: 73
 B1: 69
 B4: 60, 69
 B6: 69
 B7: xxvii, 68n31, 72
 B7: 68n31, 72
- Plato**
Apology
 19c: 12
 23c–d: 164n18
Cratylus
 402a: 44
Meno
 74c ff.: 137
 86d–87c: 4
Phaedo
 89c–91e: 186n94
 96a: 86
 96a–102a: 186n94
 97b–98c: 146n7
 97b–99d: xxin27, 10n8
 97b–101e: 12
 99c: 12n12, 13
 99d–101e: 4
 107c–15a: 13
Phaedrus
 269e–270a: 15

- Plato**, *Phaedrus* (cont.)
 270a: 15
 270b: 15
 270c2: 15
- Philebus*
 16b–17a: 16
- Protagoras*
 321d: 76
 343b: 170n33
- Republic*
 509b: 14
 600a: 58
 614b–21d: 13
- Sophist*
 241d: 163n15
- Symposium*
 211b3–5: 121n21
- Timaeus*
 27a: 16
 28b–29a: 12n11
 29b–c: 14
 29c: 14
 29d: 14
 30b: 14
 48d: 14
- Pliny**
Natural History
 2.149–50: 152n11
- Plutarch**
The Face of the Moon
 932a: 151
- Life of Nicias*
 23.2–4: 170n33
- Lysander*
 12.1–2: 152n11
- Moralia*
 366a: 68n30
- Porphyry**
Vita Pythagorae
 41: 62
 42: 59
- Pseudo-Aristotle**
On Melissus, Xenophanes, Gorgias
 3.4: 82
- Pseudo-Plutarch**
Miscellanies
 4: 82
- Sextus Empiricus**
Adversus Mathematicos
 VII.132: 37n3
- Simplicius**
In de Anima
 68.11–14: 131n37
- In de Caelo*
 471.4: 75n40
- In Physics*
 24: 27
 26: 27
 155.23: xxivn27
 163.18: 123
- Xenophanes** [21]
 A13: 86
 A28: 82
 A32: 80
 A33: 80, 86
 A38: 63, 81
 A39: 81
 A41a: 86
 A43: 81
 A44: 81
 A45: 81
 A48: 86
 A50: 80
 B1: 78, 90
 B2: 28, 29n39, 78, 90
 B2.13: 79
 B2.15: 79
 B3: 78, 90
 B4: 86
 B5: 78
 B6: 78
 B7: 78
 B8: 78
 B10: 78–79
 B11: 6, 78
 B12: 6, 78
 B14: 6, 78n4, 79, 85, 115
 B15: 6, 78, 85, 115
 B16: 78, 85–86
 B18: 78, 86–87
 B19: 78
 B20: 78
 B21: 78
 B21a: 86
 B22: 78, 90
 B23: 78, 82, 88, 115
 B24: 78, 82–83
 B25: 78, 82–83
 B26: 78, 82–83
 B27: 78–80
 B28: 28, 29n39, 78
 B29: 78, 80
 B30: 78, 80
 B30.2: 79
 B31: 78
 B32: 62, 78, 80, 84, 88
 B33: 78
 B34: 78, 84–86, 88, 90
 B34.1: 79n5
 B34.1–2: 87
 B34.2: 85
 B34.3: 79
 B34.3–4: 85
 B35: 86
 B37: 80
 B38: 83n13, 87
 B39: 79n6
 B40: 79n6
 B45: 78

Index of Names

- Aelian, 62, 67
 Aeschylus, 78n4, 85n16,
 140, 153
 Aetius, 68n31, 70, 80, 98,
 152n12
 Alcidas, 59n10
 Alexander the Great, 162–63
 Algra, Keimpe, 23n13, 23n14,
 116n7, 120n17, 123n26
 Anaxagoras, xxii–xxiv,
 xxviii, xxx, 1, 4–5, 7–10,
 12–13, 15–16, 29, 56, 71, 79,
 84, 89n22, 93, 103, 114, 116,
 117nn8–9, 120, 123–24,
 130n34, 135, 137, 139–56,
 158, 166n22, 168, 171, 185,
 190, 196
 Anaximander, xiii, xvn10,
 xvn11, xvi–xviii, xxvii,
 2–3, 17–35, 47n26, 56, 61,
 66, 71, 103n24, 146, 159n2,
 190, 197, 200, 204, 206
 Anaximenes, xiii, xvnn10–
 11, xvii–xviii, xxiin24,
 xxvin32, 2–3, 27–28, 55–
 56, 62, 66–67, 158
 Apollodorus, 21, 23n13
 Apollonius, 59n11
 Archelaus, 168
 Archytas, 60
 Aristotle, xiv–xv, xixn18,
 xxiin25, xxiiin26, xxiiin27,
 xxviiiin35, xxx–xxxiii, 7,
 9–10, 15–18, 20–24, 26,
 28–29, 31n44, 33, 35, 37,
 38n6, 40, 44, 46, 58–62,
 65, 68–69, 71–77, 117, 122–
 23, 130n34, 132n39, 137–38,
 146–47, 148n8, 155, 157,
 160n7, 161–64, 165n20,
 166–67, 170–72, 173n45,
 175, 177, 179, 180n71, 182–
 83, 186–87, 189, 197, 204
 Attila the Hun, 180
 Bacon, Francis, xxxii–xxxiii,
 xxxv, 154, 157–88
 Baldry, H. C., 30n41
 Ballou, Lynne, 18n3, 19n4,
 34n58
 Barnes, Jonathon, xiii–xiv,
 xviin14, xxi–xxii, xxvn31,
 7n5, 24n18, 33n56
 Benardete, Seth, 163n14
 Bicknell, P. J., 18n3, 81n8
 Bollack, Jean, 95n9
 Bremmer, J., 57n5, 63n17
 Broadie, Sarah, 88n19,
 90n23, 119n14
 Burger, Ronna, 186n94
 Burkert, W., 7, 56, 58, 59,
 62n16, 64, 67, 70, 92n1, 117
 Burnet, J., xviiin14, xixn17,
 xxiin25, 41n13, 51n32,
 105n29, 113n1
 Bywater, I., 51n32
 Chantraine, Pierre, 85n15, 94
 Cherniss, Harold, 21, 23–24,
 77, 161
 Cicero, 160n7, 163n16, 168–
 69, 176n55, 179
 Copernicus, Nicolaus, 70
 Cordero, Néstor-Luis, 99n16,
 104n27, 109n40
 Cornford, F. M., 7, 25n23, 26,
 30n41, 31n46, 32n48, 33,
 135n44
 Couprie, Dirk, 20n5, 23,
 25n22
 Crane, T., 116
 Curd, Patricia, xxii–xxiii,
 37n5, 107n32, 121n19,
 123n25, 132n38, 133n40,
 136n45, 137n49, 140n1
 Darwin, Charles, 16, 51
 Delatte, A., 67
 De Maistre, Joseph, 163n15,
 167n25
 Democritus, xiii, xxii,
 xxviii–xxxi, xxxiii, 1,
 9–11, 16–17, 60, 71, 130n34,
 158, 165n20, 166n22,
 167, 170–71, 175–85, 187,
 188n97
 Descartes, 1, 11
 de Vries, Willem A., 107n33
 Dicks, D. R., 92n1, 93n4
 Diehl, Ernestus, 33n54
 Diels, H., 21–22, 26, 36,
 47n25, 51n32, 52n35,
 68n31, 160
 Dilcher, Roman, 37n5,
 45n20, 46n22, 52n34
 Diogenes of Apollonia,
 xiiin3, xvn10, 152, 159
 Dorter, Kenneth, xxvi
 Dryden, John, 159n3
 Eddington, A. S., 11, 156
 Einstein, Albert, 140, 156
 Ellis, R. L., 158n1, 167n25
 Empedocles, xxii–xxiv,
 xxviii, xxx, 7, 9–10, 12,
 16, 29, 33, 56, 76, 113–38,
 140n1, 141, 144, 149–51,

- Empedocles (*cont.*)
154–55, 158, 165n20, 166n22, 167, 171, 190
- Epicurus, xxx, 178–79
- Euctemon, 93
- Eudemus, 4, 71, 74, 149n9
- Euripides, 78n4, 82, 153
- Eurytus, 159n2
- Eusebius, 21
- Fink, Eugen, 36n1, 52n34, 53n36
- Finkelberg, Aryeh, 27
- Fränkel, Hermann, 86n17
- Frede, M., 122n22
- Freeman, Kathleen, 41n13
- Furley, D., 70, 75
- Gadamer, H. G., 41n13
- Galileo Galilei, 1, 11
- Gatty, Harold, 101n20
- Genseric, king of Vandals and Alans, 180
- Gesner, Konrad von, 67
- Gilbert, 166n23
- Gilson, Etienne, xxixn38, xxxi
- Gomperz, Theodor, 105n30, 118n13
- Gottschalk, H. G., 27
- Graham, Daniel, xvni10, xvni11, xxiv, 18n1, 20, 23n14, 26n26, 27, 35, 56n1, 93n3, 102, 103n24, 135n43, 143n3, 145n4, 149n9, 151n10
- Gulley, Norman, 18n3
- Guthrie, W. K. C., xx, 22, 23n13, 31, 42n15, 44n18, 50n29, 57–59, 117–19, 122
- Hahn, Robert, 25n21
- Hamlyn, D. W., 18n3
- Harrison, Charles T., 184n89
- Heath, D. D., 158n1
- Hecataeus, 6, 49, 153
- Hegel, G. W. F., 51n33, 158, 190–92
- Heidegger, Martin, xxiv–xxv, 36n1, 37n2, 37n5, 41n13, 157–58, 162, 189, 191, 197–208
- Heitsch, Ernst, 86n17
- Heracitus, xvni10, xxii24, xxii25, xxiii, xxv–xxvi, 2, 5–7, 16, 36–54, 61, 84, 90, 113n1, 114–15, 122, 124, 148, 158, 165n20, 167, 171, 190, 192, 193, 194, 197
- Hermann, Arnold, 99n15
- Herodotus, 6, 32, 85, 153, 159n2
- Hesiod, xii, xxxn40, 1–2, 6, 8, 17, 39n9, 40, 49, 55–56, 60, 65–66, 78, 80, 83, 90, 97, 159
- Hintz, Eric, 151n10
- Hippocrates of Chios, 4
- Hippocrates of Cos, 159n2
- Hippolytus, 21, 26, 78n4, 86, 150–51
- Hölderlin, Friedrich, 52n34, 199, 203–4
- Homer, xii, 6, 39, 49, 51, 78, 80, 83, 85n15, 90n23, 94–96, 118–19, 159
- Huffman, Carl, xxvii, 60n12, 61n14, 69n32, 71n36, 73n38, 76n43
- Hülsz, Enrique, 40n12
- Hussey, Edward, xxviii33, 80n7, 83n12, 86n17
- Iamblichus, 58–59, 61–62
- Ierodiakonou, K., 130n34, 137n49, 138
- Inwood, Brad, 113n1, 117, 126–27, 132, 134n41
- Jacoby, Felix, 6n4
- Jaeger, Werner, 32–33, 175
- Jonson, Ben, 159n3
- Jünger, Ernst, 200
- Juvenal, 179
- Kahn, Charles, xi–xii, 18n2, 21–22, 23n14, 24–25, 26n26, 26n27, 28–29, 30n40, 31–32, 36n1, 37n5, 38n6, 38n8, 39n9, 41n13, 42n15, 43n16, 46n22, 47n26, 48n27, 50n29, 52n34, 74, 99n15, 103n24, 135n44
- Kant, Immanuel, xxxiii, 92, 104–7, 109, 111–12, 190–92
- Karasmanis, Vassilis, 99n15
- Kennington, Richard, 172n39, 183n84
- Kerferd, George B., 143n3
- Kiernan, Michael, 158n1, 159n3
- Kingsley, P., 126n29
- Kirk, G. S., 26n25, 37n5, 38n8, 42n15, 43n16, 44n18, 48n27, 50n29, 52n34
- Kranz, W., 21–22, 36, 51n32, 160
- Lactantius, 160n7
- Laertius, Diogenes, 58, 103n24, 140n1, 160n7, 171, 175n51
- Laporte, Paul, 25n21
- Lawrence, T. E., 155
- Leibniz, Gottfried, 1, 190–91
- Leshner, James, xix, 86n17, 89n21, 146n6
- Leusippus, xxviii36

- Lloyd, Geoffrey, 2n1
 Long, A. A., xin1, xixn19, xxiiin27, xxvin33, xxviiin36, 119n14
 Lucretius, xxx, 2, 10, 160n7, 179, 184n89
- Mann, W. R., 122n22, 123n25
 Mansfeld, Jaap, 140n1
 Marcovich, M., 37n5, 50n29, 52n34
 Martin, A., 135n42, 135n44
 McCarthy, John, xxxii–xxxiii
 McDiarmid, J. B., 21–22
 McKirihan, R., xxn20, xxivn28, xxvin32, xxxn39
 Melissus, xix, 77n2, 114n2, 116, 121nn20–21, 159
 Mellor, H., 116
 Meton, 93
 Minar, Edwin L., 18n3, 58
 Mnesarchus, 61
 Moravcsik, Julius, 38n7
 Morris, Ian, 57, 58n7
 Mourelatos, Alexander P. D., xxi, 81n9, 120, 121n19, 123n25
 Murray, Gilbert, 31, 32n48
- Newton, Isaac, 156
 Nietzsche, Friedrich, xxxiv–xxxv, 8, 44n17, 158, 189–97, 199–204, 207
 Nussbaum, Martha, 41n13, 46n22, 53n37, 113n1, 117
- O'Brien, Denis, 18n3, 135n44, 140n1
 O'Grady, Patricia, xvni0
 Oinopides, 93
 Onians, Richard, 33–34
 Osborne, Catherine, 24, 114, 124n28
 O'Shea, James, 107n33
- Palmer, John, 83n13, 116n5, 117
 Panchenko, Dmitri, 149n9
 Parmenides, xix–xxii, xxvii–xxviii, xxx, 4–9, 11, 14, 16, 28–29, 56, 72–73, 76, 78–79, 90, 91–112, 114–15, 120–21, 123–24, 127, 141–43, 147–50, 153–55, 158, 166n22, 167, 171, 190, 198, 200
 Patricius the Venetian, 166n23
 Patterson, Richard, 99n15
 Pericles, 15, 140
 Pherecydes, 18n2, 34
 Philo, 160n7
- Philolaus, xxvii–xxviii, 6n2, 59–60, 66, 68–76, 93, 158, 166n22, 171
 Philoponus, 131n37
 Philostratus, 160n7
 Pindar, 34
 Plato, xixn19, xxiiinn26–27, xxx–xxxiv, 4, 7, 10–17, 20–21, 28–29, 35, 38, 44–45, 51n33, 58–60, 66, 76, 86, 87n18, 93n4, 98n15, 114–15, 118, 121n21, 123–24, 130n34, 136–37, 146, 155, 157, 160n7, 165n20, 172n43, 175n51, 177, 179, 183, 186–87, 189, 192–93, 196, 198, 200, 202–4, 207
 Pliny, 152
 Plutarch, 21, 68, 98n15, 151, 152n11, 160n7, 170n33
 Popper, Karl, 3, 100n19, 102–3, 105
 Porphyry, 39n9, 58–59, 62
 Poussin, Jean-Marie, 167n25
 Powell, Barry, 57, 58n7
 Primavesi, O., 135n42, 135n44, 136
 Pritzl, Kurt, xvi–xvii, xxvii, 172n41
 Proclus, 4
 Pseudo-Aristotle, 82
 Pseudo-Plutarch, 82, 166
 Pythagoras, xxv, xxvii–xxviii, xxxiii, 5, 49, 55–68, 73–74, 76, 78, 92, 158, 166n22, 175n51, 177–78
- Raven, J. E., 7, 26n25, 117–19, 122
 Rees, Graham, 159nn2–3, 162n11, 167n24, 181n72, 185n92
 Reinhardt, Karl, 48n27
 Renehan, R., 115n4, 118–19, 121–22, 126
 Rescher, Nicholas, xviii2
 Rethy, R., 38n6
 Riedweg, C., 63–67, 76n44
 Ritter, Heinrich, xiii3
 Robinson, Richard, 87
 Robinson, T. M., 37n5, 38n6, 39n9, 41n13, 42n15, 44n18, 50n29, 52n34
 Rose, Valentin, 59n11
 Rousseau, Jean-Jacques, xxxiii, 192
 Ryan, E. G., 122n23
- Scaliger, Joseph, 99
 Schindler, D. C., 43n16
 Schofield, M., 26n25, 113n1
 Schopenhauer, Arthur, 190–91
 Sedley, D., xixn19, 113n1, 115n2, 116n7, 117, 121, 123n26, 130n34

- Seibt, Johanna, 107n33
 Sellars, Wilfrid, 11, 92, 107–12
 Severinus, 166n23
 Sextus Empiricus, 37
 Sider, D., 114n2, 140n1
 Simplicius, xxiiin27, 18–22, 27, 31, 75n40, 123, 131n37, 134n41
 Sinnige, T. G., 18n3
 Siven, Nate, 2n1
 Snell, Bruno, xiin2, 119
 Socrates, xiiin3, xiiin4, xviiin15, xixn19, xxx, xxxii, xxxiv, 12–15, 20, 25, 35, 44, 84, 157, 166, 168–69, 171–72, 174, 179, 185–88, 191–93, 196, 202
 Solon, 33, 90
 Sophocles, 153
 Sophonias, 131n37
 Spedding, J, 158n1
 Stobaeus, Joannes, 7n5, 21
 Strauss, Leo, xxiiin26, 189
 Taylor, A. E., 140n1
 Taylor, C. C. W., xxviiin36
 Telesio, 166n23
 Thales, xi, xiii–xviii, xx, xxiiin24, xxv, xxvin32, 1–2, 4, 17, 38, 77n1, 78, 93n3, 139, 141, 152–53, 155, 158, 169, 184
 Theophrastus, xviiin16, 21–22, 26, 68–69, 137, 204
 Thucydides, 32, 192
 Trépanier, S., 130n34
 Varro, 169
 Velkley, Richard, xxxiv, 189
 Vlastos, Gregory, 38n8, 93n4
 Warren, J., 114n2, 116n5, 121n19
 Waugh, Joanne, 37n5
 Wehrli, F., 71n37, 149n9
 West, M. L., 65n20
 White, Stephen, 93n3
 Wilcox, Joel, 37n5, 46n22
 Wöhrlé, Georg, 149n9
 Woodbury, Leonard E., 26n25, 140n1
 Wright, M. R., 114, 124n28, 127, 129, 131n35, 131n37
 Xenophanes, xvni0, xix, xxix–xxx, 5–6, 28–29, 49, 62, 63, 65, 67, 77–90, 91, 93, 96, 99n18, 102–3, 114–15, 122, 124, 148, 158, 166n22, 171
 Zalta, Edward N., 107n33
 Zeno, xix, 5, 9, 11, 27n32, 28–29, 114n2, 159n2

Index of Subjects

- acusmata*: of Pythagoras, xxvii, 60–76
aether, 29n39, 52n34, 129–30, 142, 150. *See also* elements
afterlife, 10, 179. *See also* Hades;
reincarnation; Tartaros
air, 29n39, 46n23, 47n25, 55, 63, 65, 69, 73,
117, 118n11, 125, 131n37, 144, 146–47, 150,
154; Anaximenes on, xiv, xviiin24, xviii–
xix, xxiiin24, 3, 27–28, 56, 67, 122. *See also*
elements; roots
alêtheia, xx, 14, 16, 29, 35, 38, 198–99, 202;
alêtheia section in Parmenides's poem,
xx–xxii, 8, 11, 91–112, 141; in Francis
Bacon, 165, 167, 170–71, 182, 186; in
Heidegger, 197–208; in Heraclitus, 43, 49;
in Nietzsche, 195–97; in Xenophanes, 84–
85, 87–90. *See also* knowledge; relativity of
judgments and perceptions
ambiguity, 6, 36n1, 91, 94n5, 95, 98,
105n28
analogy, 7, 41n13, 47, 109, 127, 130
anthropomorphism, xxxn39, 2, 6, 13, 78.
See also god(s) and goddess(es), in
Xenophanes
apeiron, 121; in Anaxagoras, 145, 154; in
Anaximander, xiv–xviii, xxvii, 18–35, 122;
and *peras* in Philolaus, xxvii, 56, 69, 71–72,
82; in Plato's *Philebus*, 16
Aphrodite, 3, 12, 125, 129–31. *See also* Eros;
love
appearance(s), xvii–xviii, xxii, 186, 192,
197–98; in Anaxagoras, xxv, 10, 141–5; in
Anaximander, 29–30; Democritus, xxviii–
xxix, 11; in Empedocles, 125; in Heraclitus,
38; in Parmenides, xx–xxii, 8, 11, 92, 104–
7; in Philolaus, 70–76; in Xenophanes, 78,
80–81, 88–90. *See also* Manifest Image;
relativity of judgments and perceptions;
Scientific Image; sensation
archê, xii, xiv, xvi–xix, xxii–xxiii, xxv,
xviiiin15, xxviii32, xxvii–xxx, xxxii–xxxv,
3, 9–10, 12–13, 15–17, 19–20, 22–23, 27–28,
34–35, 38, 42, 45, 47, 50, 52–53, 69, 71–2,
80, 87, 89–90, 108–9, 111–12, 115, 117, 124,
126, 130, 135, 141–45, 166–68, 172, 175–76,
181–84, 191, 198–207
astronomy, 2–4, 8–9, 13, 15, 23, 71, 91–104,
150, 154–55
atom(s). *See* atomism
atomism, 16, 108; in Democritus and
Leucippus, xvii, xxvii–xxxii, 7, 9–12, 27–30,
35, 44n18, 68n31, 116–17, 123–24, 130n34,
153–54, 170, 173, 176–79, 181–85, 187. *See
also* seeds
becoming, xiv, xviii, xxv–xxvi, xxviii–xxix,
9–11, 13–14, 16, 51, 55, 114–16, 122–25, 128–
30, 185; in Anaxagoras, 123, 141–46; in
Anaximander, xvi–xvii, 19, 28, 30–32; in
Empedocles, xxiiin26, 124–36, 144; and
logos in Heraclitus 37, 39–41, 44–45, 47–
49, 51; Nietzsche's affirmation of, xxxiv,
192–94, 197, 203n41, 204; Parmenides's
denial of, xx–xxii, 7, 10, 141–42; in
Xenophanes, 80. *See also* birth; force(s);
death; love, and strife in Empedocles;
mixture
beginning. *See archê*
being, xiv, xvi–xx, xxii, xxv–xxvii, xxix,
xxxn41, xxxiv–xxxv, 7–8, 14–15, 19, 29,
80, 104, 107, 114, 119–21, 126, 142, 182, 193,
197–207
birth: in Anaximander, 30–31; of Ocean, 55;
in Philolaus, 73. *See also* becoming; death
body. *See* matter
boundless. *See apeiron*
breath (breathing), 35, 71, 73

- cause(s), 22, 33, 124–25, 128, 132, 134, 141, 146, 162n11, 173, 178, 185. *See also* archê; force(s)
- change. *See* becoming
- chaos: in Anaxagoras, xxv, 142–43, 145, 153–54
- cloud(s), 56, 63, 80–81, 84, 88–89, 93, 102, 122, 143, 146–47. *See also* mist; rainbow; St. Elmo's fire
- coming-to-be. *See* becoming
- condensation and rarefaction, 89; in Anaximenes, xvii, xxii24, xxvii32, 3, 56, 67. *See also* force(s)
- convention. *See* *nomos*
- cosmogony, xxi, 2, 20, 35, 194; of Anaxagoras, 145–47; Aristotle's rejection of, 17; of Hesiod, 55–56; of Philolaus, 71–73. *See also* theogony
- cosmology. *See* cosmos
- cosmos, xii, xxx; in Anaxagoras, xxii–xxv, xxx, 5, 9–10, 13, 16, 79, 141–48, 153–54; in Anaximander, 3, 18–20, 23n13, 30n41, 28–31, 33–35; in Anaximenes, 67; in the atomists, xxii, xxviii–xxx, 10–12, 16; in early Pythagoreanism, xxvii, 5, 55–68, 73–76; in Empedocles, xxii–xxiv, xxx, 9–10, 113, 125–26, 128–36, 178; in Francis Bacon, 166, 168, 185; in Heraclitus, xxv–xxvii, 5–6, 39–53; in the Milesian philosophers, xv–xviii, 1–5, 8–9, 141; in Parmenides, xxx, 5–8, 106, 109–11, 123, 141–42, 147–48; in Philolaus, xxvii–xxviii, 68–76; in Plato, 12–17; in Xenophanes, xix, 6, 62, 77, 80–90. *See also* astronomy; cosmogony; nature
- counter-earth: in Philolaus' cosmology, 70, 73, 75
- custom. *See* *nomos*
- daimon(ês)*, 62, 124n28, 135–36
- day, xxi, 31–32, 74–75, 81n8; in Heraclitus, 37, 39n9, 40, 44n18, 47–48, 148; in Parmenides, 96, 99, 100–101, 102n21, 148
- death, 62, 65, 192; in Anaximander, 30–31; in Heraclitus, 6–7, 41n13, 44n18, 47–48. *See also* afterlife; Hades; reincarnation
- demiurge, xxx, 12–13, 56, 197
- destruction. *See* becoming
- divinity. *See* god(s) and goddess(es)
- doxa*, xxxii–xxxiii, 157, 167, 170, 172, 186–87, 196; section in Parmenides's poem, xx–xxi, 8, 11, 91–112, 123, 141; in Xenophanes, 78, 84, 87–88, 90
- doxographical tradition, xviii14, 22, 24n18, 63, 68n31, 69, 80, 98, 131n37, 161
- dualism: in Anaximander, 197; Cartesian, 116; epistemic, 11, 14; ontological, 153
- earth: element, xviii, 4, 28–29, 46, 56, 64, 122, 125, 129, 130, 132, 137, 142, 144; planet, xiv, 3–4, 8, 12, 22–23, 28–29, 38n6, 55, 64–65, 70, 73–75, 98–99, 101, 103, 122, 125, 128–29, 131, 146–51, 169, 173, 181, 194, 205, 207; and water in Xenophanes, 28–29, 80–81, 88–89, 122. *See also* counter-earth; elements; Isis; roots
- earthquake, 62, 65
- eclipse(s), 4; Anaxagoras on, xxiv, 8–9, 139–40, 149–51, 155–56; Anaximander on, 3, 74; Parmenides on, 8, 93, 103; Thales on, 77n1; Xenophanes on, 86, 89, 93
- Egypt, 68, 86, 147, 149, 152, 165. *See also* Isis; Nile
- element(s), xii, xvii11, xvii, xix, xxii–xxiv, xxvi, xxviii–xxx, 7–10, 19–20, 27, 30n42, 31, 32n49, 35, 46n23, 47n24, 50, 52n34, 55, 64–66, 72–73, 109n40, 113, 132n39, 135n42, 142–46, 153–54, 177. *See also* atoms; roots; seeds
- Eros, 55
- evaporation. *See* condensation
- Evening Star, xxi, 7, 92, 97, 147
- evil, xxxn39, 134, 155, 191, 195, 204; in Heraclitus, 36–54
- fire, xvii11, xvii–xviii, 56, 59, 63, 65, 81, 122, 173; in Anaxagoras, 139, 143–44, 147; in Anaximander, 3; in Heraclitus, xxii24, xxv–xxvi, 17, 38, 41n13, 42, 46n23, 47–48, 52n34, 63, 114; in Parmenides, 7, 94–96; in Philolaus, 69–76. *See also* root
- flux: in Heraclitus, xxvi, 44, 46
- force(s), xxii–xxvi, xxviii, xxx, 10, 35, 64, 89, 113–15, 121, 124, 127–35, 137, 147, 194, 197
- generation. *See* becoming
- genesis. *See* becoming
- god(s) and goddess(es), xii, xxix, 2–3, 16, 125–26, 130, 136, 175, 177–78, 180n69, 191, 199–201; in Anaximander, 28, 30, 33–35; in early Pythagoreanism, xxviii34, 55–

- 56, 62, 64, 67–68, 70, 73; in Heraclitus, 38–40, 42, 47–51, 53; Olympian, 2, 83, 152; in Parmenides, xxn20, 94, 96, 100n19, 107, 110–12, 121, 123n24; Titans, 2, 65; in Xenophanes, xxix, xxx, 6, 77–90, 114, 124
- Hades, 29n39, 41n13. *See also* afterlife; death; Tartaros
- harmony, xxx, 5, 57, 69, 160, 195–96, 202; Empedocles, 129–31; in Heraclitus, 39, 49–51, 53–54
- hearth, xxvii, 69–70, 72
- heaven(s), 3–4, 19–20, 22, 28, 29n39, 55, 70, 73, 103, 139, 152, 168–69, 173, 181. *See also* cosmos
- heavenly bodies, 3, 22, 70, 73, 96, 125, 146–47, 149–50, 152, 154
- infinite divisibility: and Anaximander's *apeiron*, 27–28. *See also* chaos
- infinity, 27–28. *See also* *apeiron*
- injustice. *See* justice
- intelligence. *See* nous
- Iris. *See* rainbow
- irony, 94n5, 200
- Isis, 68. *See also* Nile
- Isles of the Blessed, 62–66, 74
- justice, 185, 192, 197, 202; in Anaximander, 19, 31–35, 47n26; in Heraclitus, 39, 45, 48–49, 51–52. *See also* virtue
- knowledge, xvi, xix, xxvi, xxxii–xxxiii, xxxv, 3, 5, 8, 12, 14–15, 43, 69, 77–78, 80, 84–90, 92–94, 99, 106, 110, 140, 154, 156, 160, 164n18, 165, 170, 180n69, 182, 187, 197. *See also* truth; wisdom
- kosmos*. *See* cosmos
- Kronos, 2, 55, 62, 65–66
- language, xii, xxvi, xxxn40, 6, 22, 37, 44n18, 46, 72, 84, 100n19, 104, 110n44, 111, 113n1, 119, 128, 134–35, 163, 172, 199, 201, 204–5 law. *See also* *nomos*
- life, xv, 6–7, 16, 22, 32, 34, 39, 47–50, 64, 86, 88, 108, 124n28, 133–34, 145, 169, 175n53, 193, 195, 208
- Light and Night: in Parmenides, 7, 94n5, 103–5, 110, 142
- lightning, 3–4, 36, 52, 65–66, 89, 143; in Heraclitus, 36n1, 52n34
- limit and the unlimited. *See* *apeiron*
- logos*, xii, 1, 6, 12, 14–15, 29, 35, 37, 44, 56, 109n40, 187, 198; in Heraclitus, 6, 36n1, 37, 38n6, 39, 41–43, 45, 46n22, 48–49, 114, 122, 124, 171, 186, 196. *See also* reason
- love, 2, 41n13, 46, 100n19, 195; and strife in Empedocles, xxii–xxiii, xxx, 10, 12, 35, 56, 113–38. *See also* Aphrodite; Eros
- Manifest Image, 11, 107–12
- material. *See* matter
- materialism, xvni, xxxiii, xxviii, 10–12, 16, 115–24, 177n61. *See also* matter
- mathematics, 1, 2n1, 13, 15, 27, 57–60, 111, 176
- matter, xxiiin24, xxxiii–xxiv, xxvi, xxviii, 15–16, 20, 22, 28, 34–35, 38, 42, 46n23, 47n24, 55, 62–64, 78–79, 82, 84, 88–89, 89n22, 108, 110, 113–24, 127, 130, 132, 135–37, 142–43, 145–46, 153–54, 173, 177n61, 180–86
- metrical effect, 98n12, 99
- mind. *See* nous
- mist, 143, 147. *See also* air; cloud
- mixture, xix–xx, 46n23; in Anaxagoras, xxxiii–xxiv, xxviii, 9–10, 123, 135, 142–44, 153; in Empedocles, 113, 123, 125–28, 131–32, 135–37; in Xenophanes, 80, 86
- monism, xvni0, xvni1, xixn19, xxn21, xxiiin24, 116–17, 122
- monist. *See* monism
- moon, xxi, 3–4, 8, 62–63, 65–66, 70–71, 73–74, 81, 89, 92–93, 96, 98–103, 139, 146–51, 154–55
- Morning Star, xxi, 7, 92, 97, 147
- motion, xxviii–xxx, 3, 12, 15, 33, 44n18, 56, 63, 74, 81, 97, 114–15, 124n28, 127, 130n34, 132–34, 146–47, 168, 183–85. *See also* becoming
- myth, xii, xxvii, xxx, 1–2, 13, 15, 33, 55–68, 70–71, 73, 76, 89, 96, 108, 152, 159n6, 165, 196
- nature. *See* *phusis*
- night, 31, 74–75, 148; in Heraclitus, 38, 39n9, 41n13, 47–48; in Parmenides, 7, 94n5, 96–101, 104–5, 110, 142
- Nile, 67–68; flooding of, 152–53
- nomos*, 11, 41–42, 51, 53, 196
- non-being, xx, 14, 120–21, 141–42
- nous*, 13, 16, 44n18, 35, 55, 172–73, 176–78, 183; in Anaxagoras, xiii, xxiv, xxx, 12, 15–16, 35,

- nous*, in Anaxagoras (*cont.*)
56, 79–80, 84, 89n22, 114–17, 116n5, 117n9,
120, 145, 146, 153; in Empedocles, 122,
124, 130; in Heraclitus, 38–39, 49–50; in
Parmenides, 114–17; in Xenophanes, 82–84
- number, xxvii, 59n11, 61, 69, 73, 154, 168, 176
- ontology, xxii25, 14, 143–44, 198
- opinion. *See doxa*
- opposite(s), xxi, xxii25, xxvi, 10, 69, 76; in
Anaximander, 31, 32n49; in Heraclitus, 40,
46–47, 122–23
- origin. *See archê*
- paradox, xixn19, xxvi, 24–25, 40, 42–43, 45,
49–50, 53, 92, 104, 111, 171, 177, 186, 194
- passing-away. *See becoming*
- peras*. *See apeiron*
- perception. *See sensation*
- perishing. *See becoming*
- Persephone, 62–65, 68
- phenomena. *See appearance(s)*
- phusis*, xi–xii, xiv, xvii, xxii, xxiv, xxvi, xxviii,
xxxiii–xxxv, 1–4, 6–7, 9, 11–17, 29, 31,
33n56, 37–38, 40, 45–47, 49, 56, 58, 63, 65,
67, 69–70, 73, 80, 85–86, 89, 113–14, 116–17,
119n17, 125–26, 135, 145, 153, 158, 161–62,
165–67, 169, 171, 173–77, 180–86, 188n97,
191, 197. *See also* being; reality
- planets, 3, 7, 62–66, 70–71, 73, 98, 147. *See also*
heavenly bodies; Venus
- principle. *See archê*
- Prometheus, 76
- psuchê*, xxxiv, 9, 14–16, 80, 118–19, 122, 124,
145, 159, 175, 191; in Anaximander, 34–35,
45–46; in early Pythagoreanism, 59–60,
65–66, 68, 73–74, 76; in Heraclitus, xxvii,
6–7, 115. *See also* life; reincarnation
- rainbow, 62–63, 67, 80, 88–89. *See also* cloud
- rarefaction. *See condensation*
- realism, scientific, 92, 107–12
- reality, xii, xiv–xv, xviii, xx, xxii24, xxiv, 5,
11, 14, 22, 34, 38, 45, 51, 72–73, 76, 86n17,
104–9, 116–17, 118n11, 119, 121–22, 137, 141–
46, 153, 167n26, 174, 207. *See also* being;
nature
- reason, xi–xii, xx–xxi, xxvii, xxxv, 15–16, 23,
29, 35, 37, 55–60, 90n23, 162, 171, 176–77,
187, 192. *See also* logos
- reincarnation, 47n24; in Pythagorean
teaching, xxvii, 7, 59
- relativity of judgments and perceptions,
86n17, 150; in Heraclitus, xxvi, 39–40, 42–
43, 53–54
- religion, xii, xxix, xxxi, 64, 76, 83, 133n40,
177, 180. *See also* myth; superstition;
theology
- Rhea, 55, 62, 65–66
- river(s), 44–45, 47, 80, 108, 152–53. *See also*
Nile
- roots: in Empedocles, xxii–xxiii, 10, 113, 125–
27, 129–33, 136–37, 154. *See also* elements
- St. Elmo's fire, 63, 81, 89
- Scientific Image, 11, 107–12
- scientific realism. *See* realism
- sea, 3, 29n39, 39, 55, 62, 66n22, 80, 86, 143,
153; Aegean, 139, 151; Mediterranean, xi,
xiv, 96
- seeds: in Anaxagoras, 9–10
- sensation, xx, xxivn28, xxvi, xxix, 29, 38,
41n13, 43, 44n18, 45, 88, 104–5, 108, 119,
123, 143–44, 183, 185, 192; in Empedocles,
113–14, 137–38. *See also* appearance(s)
- sense(s). *See* sensation
- soul. *See psuchê*
- source. *See archê*
- space. *See* void
- speech. *See logos*
- sphere(s), 33n56, 57, 148; in Anaximander,
30n41; in Empedocles, 10, 29, 125–27, 132,
135–36; in Parmenides, xxn21, xxvii, 29,
76, 103, 114, 120–21, 127, 147; in Philolaus,
xxvii, 70, 72–73. *See also* *apeiron*; cosmos
- spirit(s), 2, 55, 155, 158, 175, 192. *See also*
daimon(ês)
- star(s), xxi, 3, 38, 70–71, 73–75, 80, 92, 96–98,
146–47, 150–51, 156, 168. *See also* Evening
Star; heavenly bodies; Morning Star
- stone, 44n18, 56, 80, 86, 108, 150, 152, 194; of
Aegospotami, 152
- strife. *See* love, and strife in Empedocles
- sun, xxi, 3–4, 8, 12, 33, 38, 44n18, 48, 59, 62–
63, 65–67, 70–76, 80, 89, 92–104, 125, 129–
30, 139, 146–51, 153, 156. *See also* heavenly
bodies
- superstition, xxxii–xxxiii, 175–77, 179–80. *See*
also myth; religion; theology

- Tartaros, 29n39, 62, 65
 teleology, 16, 34–35, 130n34, 146, 192–94
 theogony, 55–56
 theology, 6, 89–90, 178, 180. *See also* myth;
 religion; superstition
 thunder, 3–4, 62, 65, 89
 thunderbolt. *See* lightning
 time, xxvn29, 47–48, 71, 73, 88, 99, 104, 134,
 156, 179, 198, 205, 207; in Anaximander,
 18–35. *See also* Kronos
 transmigration of the soul. *See* reincarnation
 truth. *See* *alêtheia*
- unbounded. *See* *apeiron*
 unlimited. *See* *apeiron*
- Venus, 71, 148n8. *See also* Evening Star;
 Morning Star
 virtue, 12, 49, 78, 90, 160n8, 182–85, 192
 void, xxviii–xxix, xxxn41, 11, 20, 26–28, 30,
 35, 71, 73, 116–17, 119, 121–23, 130n34, 153–
 54, 156
 vortex, 84, 146–47
- water, xviii–xx, 19–20, 27, 38–39, 44n18,
 46n23, 47n25, 55–56, 69, 109n40, 122, 125,
 127, 129–31, 137, 139, 144, 146, 153; in Thales,
 xiv–xviii, xxn21, xxiiin24, xxv, xxvin32, 38,
 184. *See also* earth; roots
 what-is-not. *See* non-being
 whirlwind. *See* vortex
 whole. *See* cosmos
 wind, 56, 80, 152
 wisdom, 12, 61, 154, 162, 164–65, 178, 185,
 187, 189, 192–95, 197; in Heraclitus, 38,
 43, 45–46, 49. *See also* knowledge; *nous*;
 virtue
 word play, 41n13, 42n14, 98
 world. *See* cosmos
- Zeus, 3, 40, 44, 52n34, 56, 65–66, 69, 75–76,
 83–84, 152



Early Greek Philosophy: The Presocratics and the Emergence of Reason was designed and typeset in Minion by Kachergis Book Design of Pittsboro, North Carolina. It was printed on 60-pound Natures Book Natural and bound by Thomson-Shore of Dexter, Michigan.