

PART A

◆ ANCIENT PHILOSOPHERS ◆

GENERAL INTRODUCTION

Ancient philosophy contains nearly all the major elements of western thought. Because of its simplicity, it is often more beautiful and edifying than later philosophical work. The ancient Greek philosophers pioneered many of the great ideas of humanity and, by studying these thinkers, we may hope to regain the original force, freshness, and clarity of their insights.

The intellectual culture of ancient Greece and Rome was optimistic and bold. The early Greeks in particular had an extraordinary confidence that they could understand the world in all of its aspects through the application of their own intellectual capacities. They discovered that we learn some of nature's secrets just by reasoning clearly and systematically based on empirical observation. This is probably humanity's greatest discovery. It was an extremely powerful, invigorating, and liberating breakthrough for the ancient Greeks. Probably for these reasons, ancient Greece gave birth to three of the greatest minds of all time: Socrates, Plato, and Aristotle.

When reading the ancient Greeks, it is important to remember that we take for granted a vast and complex background of accumulated knowledge and concepts that the ancients did not have. For example, we know that the moon is smaller than the sun; we assume that all animals and plants are classified into species; we know how to explain the existence of clouds. In the ancient world, this complex web of background knowledge and concepts had yet to be discovered and formulated. For the Greeks, this presented itself as a challenge; there was a whole world to understand and explore.

A Brief Story

Any story is a simplification of what happens. It is necessarily selective. Nevertheless, the development of ancient philosophy is an interesting story, which can be divided into four parts.

The Early Ancient Greek Philosophers

From about 580 B.C., in the eastern provinces of the Greek Empire, the first pre-Socratic thinkers (Thales and Anaximander) tried to explain systematically the nature of the universe by identifying the basic stuff out of which all things are made, and by specifying the fundamental principles that order nature. Around 500 B.C., with the work of Heraclitus and Pythagoras, this philosophy became more metaphysically oriented.

Around 450 B.C., Parmenides threatened dramatically this whole enterprise. He denied the very possibility of science or natural philosophy. He and Zeno argued for the claim that the universe is an undivided whole in which change and plurality are impossible. In other words, they argued that natural philosophy was no more than a description of illusion. The problem was that their arguments appeared sound. Although later natural philosophers, such as Democritus, tried to ward off this threat and brought progress to natural philosophy, the challenge was not met decisively.

In about 420 B.C., a new and even more skeptical approach emerged: Sophism. Partly in reaction to the diversity of earlier metaphysical theories, the Sophists such as Protagoras taught a form of relativism that spurned metaphysics and challenged the religious and moral views of the time. In general terms, the Sophists argued that there were no metaphysical and ethical truths to be learned. Instead, they taught their pupils to debate persuasively.

Socrates and Plato

In about 420 B.C., Socrates began to argue against Sophism. He took issue with its skeptical and relativist view of ethics. In order to refute such relativism decisively, Plato argued for the existence of universal Forms. These Forms, or Ideas, are abstract objects that define the essence of terms, such as 'justice' and 'goodness,' and their existence is required to explain knowledge and language. In his many dialogues, Plato expounds the implications of the theory of Forms for many areas of knowledge, such as epistemology, education, theology, ethics, art, and politics.

Plato also rejected the pre-Socratic tradition of natural philosophy, arguing that purely mechanical explanations never provide the reasons why things happen. The rejection of mechanism also indicates the need for the Forms. In other words, Plato saw the two options of pre-Socratic thought, that is, the physical mechanism of the Ionians and the relativism of the Sophists, as a false dichotomy. This points to the existence of universal Forms. It seemed that the deadlock of pre-Socratic philosophy had been resolved.

Aristotle

However, does the refutation of Sophism and mechanism really require the existence of universal Forms? Aristotle argued that it does not. He claimed that the denial of relativism does not require Platonic absolutism. Aristotle had a great interest in the natural world and the classification of species. He also classified uses of misleading philosophical terms, such as 'to be' and 'cause,' and this led him to conclude that things can be said to exist in different ways, which he calls categories. In particular, the category of 'substance' indicates what exists primarily, and other kinds of existence such as that of qualities or the Forms are derivative. In other words, Plato was mistaken to treat the Forms as if they were substances. Furthermore, Aristotle explained form and matter as two inseparable aspects of substance: the form is its essence, and the matter is what it is composed of. This allowed Aristotle to transcend both Plato and the pre-Socratics, who respectively and mistakenly treat form and matter as if they were independent substances. Aristotle thought that universals exist,

but that their existence is derivative or parasitic on natural substances. The forms are immanent in the natural world.

Hellenistic and Roman Philosophy

The period of brilliance in Greek philosophy did not end with Aristotle, even though the golden age of the city-states faded away. About 20 years after the death of Aristotle, there emerged three important new schools of philosophy: Epicureanism, Stoicism, and Pyrrhonian skepticism. As the Greece of small city-states declined and Rome became the central European power, these new systems gained strength, especially Stoicism. Around 170 A.D., the Stoic Roman emperor, Marcus Aurelius, gave grants to the four philosophical schools of Athens: Plato's Academy, Aristotle's Lyceum, Epicurus' Garden, and the Stoa of the Stoics. By this time, however, the philosophical originality of ancient Greece had been lost. Rome was already under the threat of invasion, and philosophy was about to decline.

Some Historical Background

Ancient Greece was not a single country but rather a collection of small city-states, spread throughout the Aegean, which shared a language and a culture. An important part of this common heritage was the mythology that Homer expressed in the *Iliad* and *Odyssey* in around 700 B.C. Another aspect of this shared culture was athletics: the Olympic Games, first held in 776 B.C., were also festivals in which people from all over the region participated. As its wealth increased, Greek civilization developed its distinctive drama, architecture, and other art forms, as well as the first scientific philosophy. As it spread eastward, this civilization came into conflict with the great and growing Persian Empire.

In 491 B.C., a Greek force of about 20,000 soldiers won the historic battle of Marathon against a Persian army of possibly more than 100,000. Then, in 480, after years of preparation, the Persian king Xerxes sent a huge army and navy against Greece. Remarkably, because Athens and Sparta worked together and because of their superior organization, the Greeks were able to resist this onslaught with an especially decisive sea battle at Salamis. These events mark an important turning point in European history, after which victorious Athens enjoyed a golden age of greatness. Because of its newfound wealth, stability, and self-confidence, Athens attained new intellectual and cultural heights. Pericles, who held political office from 467 to 428 B.C., led this process: he instituted many reforms that made Athens a democracy, as well as an economic and cultural center. During this golden period, the arts flourished. In 447, Pericles initiated the construction of the Parthenon. This was the period of the great tragic plays of Aeschylus, Sophocles, and Euripides, and later the comedies of Aristophanes. This was also the time of the great philosophers such as Parmenides, Zeno, Democritus, Empedocles, Anaxagoras, the Sophists, and Socrates. In Periclean Greece, Herodotus and Thucydides produced their major historical works, and Hippocrates wrote his systematic medical texts.

However, under the leadership of Sparta, the other Greek city-states, such as Megara and Corinth, challenged Athens' military and economic supremacy. This initiated the Peloponnesian War (431–404 B.C.), which Sparta eventually won. The ensuing war led to the crowding of Athens' population into the city walls, and a devastating plague resulted. Pericles was blamed, convicted, and removed from office. In that same year, 429, he died. The turning point in the war was the Sicilian Expedition of 415–413. Under the leadership of Alcibiades, Athens hoped to capture the rich city of Syracuse on Sicily, which was a colony of Corinth, Athens' great commercial rival. In this debacle, Athens lost half of its

military and naval power. This loss ignited a conflict between aristocracy and democracy in Athens, and, in 411, various oligarchic councils replaced the democratic assembly. Thereafter, Athens lost its fleet and its citizens suffered starvation during a blockade.

Athens' defeat in 404 marks the beginning of the end of the golden age of classical Greece. There was no stable peace under Spartan control. In 387, Sparta signed a pact with the Persians that gave Sparta the protection of the Persians but ceded all the Greek cities in Asia to Persian control. This led to discontent among the Greek city-states and Thebes won a famous victory against Sparta, which allowed Athens to regain supremacy of the region by around 360 B.C. However, even though it was home to Plato and Aristotle and despite its economic prosperity, Athens did not repeat the artistic and cultural achievements of its Periclean past.

SECTION I

◆ EARLY ANCIENT GREEK ◆ PHILOSOPHERS

◆ PROLOGUE

The early ancient Greek, or pre-Socratic, philosophers were interested primarily in the study of nature. They tried to describe and explain systematically natural phenomena. This makes them both the first philosophers and scientists. However, no such distinction existed 2,500 years ago: the early ancients did not separate questions that are best answered conceptually through reasoning, and those that are best addressed empirically through observation. Their philosophy was based on the assumption that nature is orderly and can be classified, explained, and understood methodically. They tried to make sense of nature without ad hoc appeal to the whims of the gods. The pre-Socratics assumed that nature is organized according to certain principles. Their main aim was to discover those principles.

This aim required them to invent or form concepts that are now usually taken for granted. For example, they used the word ‘cosmos’ to stand for the universe as an orderly whole. They employed the word ‘nature’ (or *phusis*, from which we have derived ‘physics’) to stand for things that grow, as opposed to artifacts, which are made. The aim of explaining natural phenomena also requires the concept of natural essences. Natural things have certain fundamental properties or an essence, in terms of which their other properties can be explained. The pre-Socratic enterprise also employs the notion of systematic explanation: the idea of explaining as much as possible, assuming as little as possible.

These first thinkers tried to advance arguments in favor of their positions. For this reason, they deserve to be called the first philosophers, who discovered that careful reasoning can yield knowledge of nature. Such a discovery can belong only to those who distinguish reasoning from speculation. The idea of giving arguments for one’s claims was novel. In this respect, we might contrast the pre-Socratic philosophers with the mythical stories of Hesiod’s *Theogony*. Hesiod’s poem, which was probably written in the eighth century B.C., charts the genealogy of the gods, starting with Chaos, Gaea (Earth), and Eros (Love). Its mythology became a generally accepted part of Greek culture. The poem personifies natural forces and objects and tries to explain the origin of some natural phenomena, such as

day and night, the mountains, the sea, and people. For example, it describes how the mating of Earth and her son, Uranus, the Heavens, produced the first race, the Titans.

In contrast, the early philosophers attempted to provide a single explanation of all natural phenomena and to substantiate their claims with some reasoning. The idea that claims about the nature of the universe and morality should be supported by some argument or reasoning destroys the assumption that they should be accepted for the reason that an authority advances them. Arguments are revolutionary, because they allow for more freedom of thought than acceptance based on authority.



The Development of Early Ancient Greek Philosophy

Early ancient Greek philosophy first unfolds as a story of the conflict between various visions concerning the basic principles of nature. Philosophy was born in what is today Turkey. The first philosophers, Thales (624–545 B.C.) and Anaximander, lived in the coastal town of Miletus, which was in the Greek province of Ionia. To identify the basic principles around which nature is organized, they studied many varied natural phenomena, from planets to plants.

In the second phase of pre-Socratic thought, Ionian philosophy became more metaphysical. Pythagoras (570–497 B.C.) taught that the soul is immortal and that it transmigrates even into the bodies of animals. He formed a school to teach people how to live in accordance with his semimystical views. Around 500 B.C., Heraclitus wrote a series of caustic and mystical aphorisms that express an intriguing metaphysics based on change and the duality of opposites.

In the third phase, Parmenides and his followers argued forcefully that the very idea of a science of nature was an error. These thinkers from Elea, the Eleatics, argued that there could not be a plurality of things. Parmenides wrote a poem arguing for the existence of a single, indivisible, changeless thing. Zeno supported this position with many arguments, including his famous so-called paradoxes. The works of Parmenides and Zeno constitute a fundamental objection to pre-Socratic naturalistic thought.

The fourth phase consists in various responses to Parmenides and in attempts to continue with the Milesian or Ionian tradition of natural philosophy. One of the main authors of this period is Democritus, who argued for the existence of indivisible atoms.

In the fifth phase, the Sophists embraced relativism and Skepticism, and rejected the project of discovering truths about nature, substituting for it the aim of teaching the art of persuasion. In so doing, they set philosophy a fundamental challenge: ‘Are there truths that can be discovered by reasoning?’ The replies of Socrates and Plato to this question come later in this volume.

The Texts

The original works of the pre-Socratic philosophers have been lost. Our knowledge of their thought is based entirely on later reports, quotations, and commentaries. This means that the reliability of these sources is questionable and often disputed.

The Greek philosopher Aristotle (384–322 B.C.) discussed the views of many of the pre-Socratic thinkers, and so his writings are an important source of information. Aristotle’s pupil, Theophrastus (371–287 B.C.), wrote a work called *On the Senses*, which discusses the views of several pre-Socratic philosophers. Plutarch (45–120 A.D.) wrote papers and treatises about history, biography, literature, and philosophy, which contain quotations

from the pre-Socratics. In the third century A.D., Diogenes Laertius wrote a work called the *Lives of the Philosophers*, which has survived and which is a valuable source of information about the pre-Socratics, even though some of its stories are probably false. Another very important source of many of the original texts is Simplicius' commentary on Aristotle's *Physics*, written in 530 A.D.

The fragments of the pre-Socratic philosophers, which were scattered in many later writings, were collected by Hermann and Walter Diels Kranz toward the end of the nineteenth century. Their work, *Fragmente der Vorsokratike*, was translated into English by Kathleen Freeman and published as *Ancilla to the Presocratic Philosophers*. The B numbers cited after each fragment refer to this text. However, there are later and better translations from the original Greek, which we have used in this collection. Also, the *Ancilla* does not contain the commentaries of later ancient thinkers, which are sometimes also useful.

There are considerable and unavoidable problems with translating these ancient texts. First, abstract terms such as 'logos' have significantly different senses in different contexts. 'Logos' can mean 'reason,' or 'rational principle,' or 'causal law,' or 'organizing idea' in different texts. Second, none of our English equivalent terms may capture well the nuances and ambiguities that the original Greek word may have had for an ancient reader. For example, 'logos' has a connotation of the divine or godly, which none of the earlier mentioned English words have. Third, additionally, all words come with a history of usage, and many of our English philosophical terms have a Christian ancestry. For this reason, it is not exactly correct to translate the Greek term 'psuché' with the English 'soul,' or 'areté' with 'virtue.' For these reasons, readers should be careful in attributing contemporary meanings to the texts.

THE MILESIANS

PROLOGUE

Our first two philosophers come from the town of Miletus, a city in the Greek province of Ionia, located on what is now the western coast of Turkey. Sometimes, these philosophers are also called the Ionians. Miletus was a wealthy seaport, a focal point for commercial activity, and partly because of this, there was increased leisure that permitted thought, discussion, and art. Miletus became a cultural center.

THALES (APPROX. 624–545 B.C.)

Biographical History

We do not know much about the life of Thales, and nothing of his work remains, if indeed he wrote, except fragments reported by later writers, such as Aristotle and Herodotus, the fifth-century (A.D.) historian. However, he was named as one of the seven sages of the early ancient Greeks, and he was known not only as a philosopher and scientist, but also as a political advisor. He urged the Ionians to establish a single council located at the center of the province. During the Persian War, when the army of Croesus could not cross the river Halys, Thales ordered the digging of a channel and dam that diverted the river so that it was fordable. He was also an astronomer who allegedly predicted an eclipse in 585 B.C., as well as discovered some of the first theorems of geometry (such as that in every

isosceles triangle, the angles at the base are equal). Reportedly he once fell in a ditch when looking at the stars. The woman he was with exclaimed, “Do you think, Thales, that you will learn what is in the heavens, when you cannot see what is in front of your feet?” In contrast, it is claimed that he wanted to show that it is easy for a philosopher to become rich: he foresaw a good early olive crop, and hired all the olive presses, which he rented out at great profit.

Philosophical Overview

Thales is famous for claiming that all things are made of water. Although this may sound like a ludicrous statement to us today, nevertheless it is important because Thales conjectured about the nature of the substance-stuff out of which everything is made. He introduced the idea of the fundamental composition of the world, and thereby launched one of humanity’s great debates. In so doing, he saw that proposing the idea of one fundamental substance-kind would be the simplest way to explain all natural phenomena. The claim that there exists such stuff is potentially the most powerful and most economical way to systematically explain nature. Moreover, as far as historical sources allow us to tell, it seems that Thales advanced an argument for his position. He claimed that water is essential to life.

Thales is also well known for claiming that all things have a soul. His argument for this claim is that magnets can move iron and that anything that is capable of initiating movement is thereby animate. By definition, anything that is animate has a soul. The Greek word *psuché* (soul) comes from the word *empsychos*, which means animate. When reflecting on this thesis, we should not impose the Christian conception of the soul as a conscious spiritual substance on Thales. His idea is more that all things are to some degree animate and that, therefore, there is no strict dividing line between what is alive and what is not.

Thales’ Fragments

As the selection shows, the most important fragments concerning the philosophy of Thales come from Aristotle, who lived some 250 years later. The wording of the first fragment, which is from Aristotle’s *Metaphysics*, reveals how Aristotle reviews the thoughts of the early pre-Socratics in order to draw lessons for his own philosophy.

FRAGMENTS

Thales

1.

Most of the first philosophers thought that principles in the form of matter were the only principles of all things. For they say that the element and first principle of the things that exist is that from which they all are and from which they first come into being and into which they are finally destroyed, its substance remaining and its properties changing. . . . There

must be some nature—either one or more than one—from which the other things come into being, it being preserved. But as to the number and form of this sort of principle, they do not all agree. Thales, the founder of this kind of philosophy, says that it is water (that is why he declares that the earth rests on water). He perhaps came to acquire this belief from seeing that the nourishment of everything is moist and that heat itself

comes from this and lives by this (for that from which anything comes into being is its first principle)—he came to his belief both for this reason and because the seeds of everything have a moist nature, and water is the natural principle of moist things.

(Aristotle, *Metaphysics* 983b6–11, 17–27)

2.

He supposed that water was the first principle of all things, and that the world has a soul and is full of

spirits. They say he discovered the seasons of the year and divided it into three hundred and sixty-five days.

(Diogenes Laertius, *Lives of the Philosophers* I 22–28, 33–40)

3.

Thales, judging by what they report, seems to have believed that the soul was something which produces motion, inasmuch as he said that the magnet has a soul because it moves iron.

(Aristotle, *On the Soul* 405a19–21)

STUDY QUESTIONS: THALES

1. What does Thales mean by claiming that everything is made of water?
2. What does Thales mean by ‘first principle’?
3. What is Thales’ view of the soul?
4. Why is Thales considered to be a philosopher?

ANAXIMANDER (610–540 B.C.)

Biographical History

Anaximander was reportedly a student of Thales. He wrote an ambitious, wide-ranging work called *On Nature*, which included a cosmology; a natural history of the Earth; a description of many kinds of natural phenomena, such as rain and wind; an account of the development of animals; and a geography, including a famous map of the world. Unfortunately, only a few sentences of this work have survived.

Philosophical Overview

Anaximander claimed that the fundamental constituent of the universe is something infinite or without limits. This is usually taken to mean something spatially infinite, eternal, and without determinate qualities, or something infinitely old and large and without definite properties. Anaximander probably held these views based on reasoning similar to that outlined below.

If the basic constituent of nature is something indefinite, as Anaximander argues, then it cannot be any of the four traditional elements (earth, water, air, and fire). Since these elements can change into one another, they cannot be basic. Furthermore, Anaximander also argued that the four elements have opposing qualities; for example, air is cold and fire is hot. If any one of these elements were unlimited, then it would have destroyed the others. Since none of the elements have been destroyed, we may conclude that the basic constituent of the universe is not one of these elements.

1. *The basic substance-stuff must be infinitely old.*
 2. *If the basic substance-stuff were one of the elements, then it would have destroyed the other elements in an infinite amount of time.*
 3. *All four elements can be observed to exist.*
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4. *Therefore, the basic substance-stuff is not one of the elements.*

Anaximander is also famous for his ingenious explanation of the fact that the earth hangs in empty space without physical support and yet does not move. He argued that if the earth is midway between all other things, then there can be no reason for it to move one way rather than another. Consequently, if the earth is the center of the universe, then it must stay where it is. To give an idea of the range of his interests, we have also included passages that show Anaximander's account of the origin of species.

Anaximander's Fragments

The first selection outlines the basic points of Anaximander's philosophy. In the second selection, which is from Aristotle's *Physics*, we find Anaximander's argument for the need of an infinite first principle:

1. *Everything must either come from a first principle, or itself be such a principle.*
 2. *The unlimited cannot be derived from a principle, for then it would be limited by that principle.*
-
3. *Therefore, the unlimited itself must be a principle from which other things are derived.*

As the third selection from Aristotle indicates, Anaximander probably also argued that the primordial substance-stuff of the universe is infinite in age because change is perpetual, and all change is the alteration of some preexisting substance.

The fourth fragment, which is quoted from Simplicius, is probably very close to Anaximander's original text, in which case it is the earliest surviving piece of written western philosophy. It gives an argument based on the premise that the basic stuff of the universe must underlie all changes. Since all of the so-called elements (earth, water, air, and fire) can change one into the other, none of them can be the basic substance of the universe.

1. *The basic substance-stuff underlies all change, and, therefore, it cannot change into something else.*
 2. *The elements do change into the others.*
-
3. *Therefore, the basic substance-stuff of the universe is not one of the elements.*

FRAGMENTS

Anaximander

1.

He said that a certain infinite nature is first principle of the things that exist. From it come the heavens and the worlds in them. It is eternal and ageless, and it contains all the worlds. He speaks of time, since generation and existence and destruction are determinate.

Anaximander said that the infinite is principle and element of the things that exist, being the first to

call it by the name of principle. In addition, there is an eternal motion in which the heavens come into being.

(Hippolytus, *Refutation of All Heresies* I-vi 1-7)

2.

It is with reason that they all make [the infinite] a principle; for it can neither exist to no purpose nor have any power except that of a principle. For every-

thing is either a principle or derived from a principle. But the infinite has no principle—for then it would have a limit. Again, it is ungenerated and indestructible and so is a principle. For what comes into being must have an end, and there is an end to every destruction. Hence, as I say, it has no principle but itself is thought to be a principle for everything else and to govern everything. . . . And it is also the divine; for it is deathless and unperishing, as Anaximander and most of the natural scientists say.

(Aristotle, *Physics* 203b6–11)

3.

[A]gain, because generation and destruction will give out unless there is something infinite from which what comes into being is subtracted.

(Aristotle, *Physics* 203b6–11, 13–30)

4.

Of those who hold that the first principle is one, moving, and infinite, Anaximander, son of Praxiades, a Milesian, who was a successor and pupil of Thales, said that the infinite is principle and element of the things that exist. He was the first to introduce this

word ‘*principle*’. He says that it is neither water nor any other of the so-called elements but some different infinite nature, from which all the heavens and the worlds in them come into being. And the things from which existing things come into being are also the things into which they are destroyed, in accordance with what must be. For *they give justice and reparation to one another for their injustice in accordance with the arrangement of time* [12 B 1] (he speaks of them in this way in somewhat poetical words). It is clear that he observed the change of the four elements into one another and was unwilling to make any one of them the underlying stuff but rather chose something else apart from them. He accounts for coming into being not by the alteration of the element but by the separating off of the opposites by the eternal motion.

(Simplicius, *Commentary on the Physics* 24.13–25)

5.

The earth is aloft, not supported by anything but resting where it is because of its equal distance from everything.

(Hippolytus *Refutation of All Heresies* I-vi 1–7)

STUDY QUESTIONS: ANAXIMANDER

1. What is the first principle, according to Anaximander?
2. What is Anaximander’s argument for claiming that the first principle must be infinite?
3. What prevents generation and destruction from giving out?
4. What are Anaximander’s two arguments for thinking that the first principle cannot be one of the four elements?
5. According to Anaximander, why does the earth float in space?
6. What would Anaximander say about the principle of the conservation of energy?

IONIANS

PROLOGUE

Although the next two philosophers are considered as Ionian in terms of their birth and tradition, their thought is significantly different from that of the earlier Milesians. The philosophies of Pythagoras and Heraclitus go beyond the scientific philosophy of nature of the Milesians because they both are also concerned with metaphysics and, to some extent, with ethics.

PYTHAGORAS (570–497 B.C.)

Biographical History

Pythagoras was born on the island of Samos in the eastern Aegean, located between Miletus and Athens. Around the age of 30, he moved to Croton in southern Italy, where he established a community of followers. The community grew and acquired political importance in the region. As a consequence of this, after about 20 years, there was an uprising against the Pythagoreans.

Pythagoras wrote nothing, but his later followers wrote much, attributing to him many views. It is from his followers that we have the picture of Pythagoras as a brilliant mathematician, who invented the theorem that, in any right-angled triangle, the square of the hypotenuse is equal to the sum of the square of the other two sides. He was portrayed as applying his mathematics to music and astronomy and, thereby, developing a metaphysical system based on numbers. However, it is difficult to define exactly what Pythagoras himself thought because the later Pythagorean schools tend to attribute to the master their own teachings. By the fourth century A.D., Pythagoras was considered the greatest of all philosophers, eclipsing even Plato and Aristotle because of his influence on both of these thinkers. As we shall see, Pythagoras had an especially important influence on Plato.

Philosophical Overview

After his death, his disciples split into two groups: the *mathematikoi* and the *akousmatikoi*. The first group was interested in the study of mathematics, music, and astronomy. The key to their ideas is that the universe consists of a harmony that should be studied mathematically. In this, they rejected the Ionian idea of trying to discover the basic stuff of the universe, replacing it with the study of form. In this study, the numerical ratios between sounds in the musical scales provided an analogy for the harmonious development of the whole universe. In other words, according to this group, we can understand the universe by knowing the numerical relations that express the harmonic ratios according to which everything changes.

The second Pythagorean school was called the *akousmatikoi*, and it followed Pythagoras' religious teaching concerning the soul and the right way to live. They regarded Pythagoras as a spiritual master who taught the existence of the immortal soul that may be reborn in animal form. This doctrine of the transmigration has two important implications. First, it implies that personal identity is constituted by the soul. A person literally is his or her soul. Second, it laid down some guidelines for the moral way of life or for a moral code. Pythagoras' doctrine of the soul means that we are not mortal beings but rather immortal souls, and that we are not really at home in our bodies. It also means that the animals are our kin and, for this reason, the Pythagoreans considered the eating of flesh as a form of cannibalism. Pythagoras probably conceived of the world as divided into good and evil, and claimed that each person must struggle to be a good moral agent.

Pythagorean Fragments

The first passage quoted below is a fragment from Philolaus, born in Croton around 470 B.C., who was the first Pythagorean to set down the teaching in writing. The other fragments are called the testimonies, which are later in origin. The selections numbered

1–3 emphasize the Pythagorean conception of number as the fundamental harmony of the universe. In contrast, the religious aspect of the Pythagoras' following is emphasized in selections 4 and 5.

FRAGMENTS

Pythagoras

1.

(DK 44B1; KRS 424) Nature in the universe was harmonized out of both things which are unlimited and things which limit; this applies to the universe as a whole and to all its components.

(Philolaus [fr. 1 Diels/Kranz] in Diogenes Laertius, *Lives of Eminent Philosophers* 8.85.13–14 Long)

2.

(DK 58B4, B5, KRS 430) At the same time [as *Leucippus and Democritus*] and earlier than them were the so-called Pythagoreans, who were interested in mathematics. They were the first to make mathematics prominent, and because this discipline constituted their education they thought that its principles were the principles of all things. Now, in the nature of things, numbers are the primary mathematical principles; they also imagined that they could perceive in numbers many analogues to things that are and that come into being (more analogues than fire and earth and water reveal)—such-and-such an attribute of numbers being justice, such-and-such an attribute being soul and mind, due season another, and so on for pretty well everything else; moreover, they saw that the attributes and ratios of harmonies depend on numbers. Since, then, the whole natural world seemed basically to be an analogue of numbers, and numbers seemed to be the primary facet of the natural world, they concluded that the elements of numbers are the elements of all things, and that the whole universe is harmony and number. They collected together all the properties of numbers and harmonies which were arguably conformable to the attributes and parts of the universe, and to its organization as a whole, and fitted them into place; and the existence of any gaps only made them long for the whole thing to form a connected system. Here is an example of what I mean: ten was, to their way of thinking, a per-

fect number, and one which encompassed the nature of numbers in general, and they said that there were ten bodies moving through the heavens; but since there are only nine visible heavenly bodies, they came up with a tenth, the counter-earth. . . .

They hold that the elements of number are the even and the odd, of which the even is unlimited and the odd limited; one is formed from both even and odd, since it is both even and odd; number is formed from one and, as I have said, numbers constitute the whole universe. Other members of the same school say that there are ten principles, which they arrange in co-ordinate pairs: limit and unlimited; odd and even; unity and multiplicity; right and left; male and female; still and moving; straight and bent; light and darkness; good and bad; square and oblong.

(Aristotle, *Metaphysics* 985^b23–986^a26 Ross)

3.

In his *Introduction to Music* Heraclides says that, according to Xenocrates, it was Pythagoras who discovered that the musical intervals also come about inevitably because of number, in the sense that they consist in a comparison of one quantity with another, and that he also looked into the question of what makes the intervals concordant or discordant, and in general what factors are responsible for harmony and disharmony.

(Xenocrates [fr. 9 Heinze] in Porphyry, *Commentary on Ptolemy's 'Harmonics'* 30.1–6 Düring)

4.

(DK 14A1; KRS 261) The Egyptians were also the first to claim that the soul of a human being is immortal, and that each time the body dies the soul enters another creature just as it is being born. They also say that when the soul has made the round of every creature on land, in the sea, and in the air, it once more

clothes itself in the body of a human being just as it is being born, and that a complete cycle takes three thousand years. This theory has been adopted by certain Greeks too—some from a long ago, some more recently—who presented it as if it were their own. I know their names, but I will not write them down.

(Herodotus, *Histories* 2.123.2–3 Hude)

5.

(DK 44B14) The ancient theologians and prophets testify to the fact that the soul has been yoked to the body as a punishment of some kind and that it has been buried in the body as in a tomb.

(Philolaus [fr. 14 Diels/Kranz] in Clement, *Miscellanies* 2.203.11 Stählin/Früchtel)

STUDY QUESTIONS: PYTHAGORAS

1. From where does harmony in nature originate, according to Pythagoras?
2. What role do ‘the limited’ and ‘the unlimited’ play in the Pythagorean notion of numbers?
3. What reasons did the Pythagoreans give for the claim that numbers were the substance of everything?
4. How did Pythagoras discover the relationship between numbers and musical intervals?
5. Explain the difference between the two Pythagorean schools.
6. What is the nature of the soul according to the Pythagoreans?
7. In what ways is Pythagoras’ thought different from that of the Milesians? Do these differences tell us anything about the distinctions between science, religion, and philosophy?
8. Are numbers a feature of things in the way that heat and coldness are?

HERACLITUS (540–480 B.C.)

Biographical History

Heraclitus was born in Ephesus, a town on the western coast of Ionia, between Miletus and Colophon. Heraclitus was of noble birth, but he gave up all of his political opportunities to pursue philosophy. He wrote his main philosophical work in about 500 B.C. Of this, over 120 fragments remain. These sayings are culled from other later writers, such as Sextus Empiricus, who quote Heraclitus. This means that we do not know the order of the short sayings of Heraclitus, except for the first two, which occurred near the beginning of the book. Of course, this order affects the interpretation of his philosophy, and consequently it is a contentious issue among scholars.

Philosophical Overview

Heraclitus was a polemical and enigmatic thinker who was scornful of the popular beliefs of the many and who rejected the authorities of the time. He wrote in a playful, poetic style, sometimes using apparently paradoxical sentences and, other times, employing memorable aphorisms. This, coupled with his rebellious attitude, makes Heraclitus a source of inspiration for many diverse later writers.

Heraclitus’s philosophy ranges over many topics, including the nature of knowledge, theology, and ethics. However, the most influential aspect of his work is his philosophy of nature. The first fragment quoted below claims that everything happens in accordance with a general law of nature (the Greek word is *logos*). Of the existing collection of fragments, several indicate his understanding of this law, and they form the basis of his natural

philosophy. First, he famously claims that everything is in flux, even when the change is imperceptible. Second, he affirms a doctrine of the unity of opposites, according to which everything is necessarily characterized by both of two opposing features, such as, ‘A road: uphill, downhill, one and the same’ (B60). According to Heraclitus, this unity of opposites is a fundamental pattern of the universe. It is in these terms that we should understand the cosmos as a process. Third, Heraclitus asserts a monism, according to which the underlying nature of the universe is fire. However, if Heraclitus means to assert that there are no permanent entities because everything is flux, then it may be incorrect to think of fire as a permanent underlying substance out of which everything is composed. In such a case, Heraclitus’ view would be probably that the cosmos is a process, rather than a static substance. The process would be one of burning and quenching, of heating up and cooling. It would be in this sense that everything is fire.

Heraclitus’ Fragments

The first fragment quoted below claims that everything happens in accordance with a general law of nature (the Greek word is *logos*). The first set of fragments, up to selection 16, stresses the hidden or esoteric nature of real knowledge. From 7 to roughly 22, the fragments indicate Heraclitus’ understanding of this general law of nature and his views on fire. Selections 23–24 state his views on change. The grouping from 16 to 24 forms the basis of Heraclitus’ natural philosophy. It is important for the reader to remember that the fragments do not come in any preordained order. They are grouped together by the translator and therefore reflect his interpretation. Some of the fragments have square brackets around them; these brackets indicate that the passage in question may not be entirely in Heraclitus’ own words.

FRAGMENTS

Heraclitus

The reversals of fire: first sea; but of sea half is earth, half lightning storm.

(D. 31A, M. 53A) Clement, *Stromateis* V.104.3

Sea pours out <from earth>, and it measures up to the same amount it was before becoming earth.

XXXIX (D. 31B, M. 53B) Clement, *Stromateis* V.104.5

All things are requital for fire, and fire for all things, as goods for gold and gold for goods.

XL (D. 90, M. 54) Plutarch, *De E apud Delphous* 388D–E

[[The death of fire is birth for air, and the death of air is birth for water.]]

XLI (D. 76, M. 66e¹) Plutarch, *De E apud Delphous* 392C

[[The sun is overseer and sentinel of cycles, for determining the changes and the seasons which bring all things to birth.]]

(D. 100, M. 64) Plutarch, *Quaestiones Platonicae* 1007D–E

[[There is a certain order and fixed time for the change of the cosmos in accordance with some fated necessity.]]

XLIIIB (D. A5) Simplicius, *in Physicorum* 23, 38

The sun will not transgress his measures. If he does, the Furies, ministers of Justice, will find him out.

(D. 94, M. 52) Plutarch, *De Exilio* 604A

The limits of Dawn and Evening is the Bear; and, opposite the Bear, the Warder of luminous Zeus.

(D. 120, M. 62) Starbo I.1.6

[[If there were no sun, it would be night.]]

(D. 99, M. 60) Plutarch (?), *Aqua an ignis utilior* 957A

[[The sun is the size of a human foot.]]

(D. 3, M. 57) Aetius II.21 (ed. Diels, *Doxographi Graeci* p. 352)

[[The sun is new every day.]]

(D. 6, M. 58a) Aristotle, *Meteorologica* II.2 355a13

Cold warms up, warm cools off, moist parches, dry dampens.

(D. 126, M. 42) Tzetzes, *Scholia ad Exegesis in Iliadem* p. 126

As they step into the same rivers, other and still other waters flow upon them.

(D. 12, M. 40a) Arius Didymus fr. 39.2, ed. Diels, *Doxographi Graeci* p. 471, 4

[[One cannot step twice into the same river, nor can one grasp any mortal substance in a stable condition, but it scatters and again gathers; it forms and dissolves, and approaches and departs.]]

LI (D. 91, M. 40c³) Plutarch, *De E apud Delphous* 392B

[[It rests by changing.]]

(D. 84a, M. 56A) Plotinus IV.8.1 (text below)

[[It is weariness to toil at the same tasks and be always beginning.]]

(D. 84b, M. 56B) Plotinus (reference above)

The wise is one, knowing the plan by which it steers all things through all.

(D. 41, M. 85) Diogenes Laertius IX.1

Human nature has no set purpose, but the divine has.

(D. 78, M. 90) Origen, *Contra Celsum* VI. 12

[[The most beautiful of apes is ugly in comparison with the race of man; the wisest of men seems an ape in comparison to a god.]]

(D. 82–3, M. 92b) [Plato], *Hippias Major* 289A–B

A man is found foolish by a god, as a child by a man.

(D. 79, M. 92a) Origen, *Contra Celsum* VI. 12

[[Human opinions are toys for children.]]

(D. 70, M. 92d) Iamblichus, *De Anima*, in Stobaeus II.1.16

What wit or understanding do they have? They believe the poets of the people and take the mob as their teacher, not knowing that ‘the many are worthless’, good men are few.

(D. 104, M. 101) Proclus in *Alcibiades* I, p. 117 Westerink

A fool loves to get excited on any account.

(D. 87, M. 109) Plutarch, *De Audiendis Poetis* 28D

Dogs bark at those they do not recognize.

(D. 97, M. 22) Plutarch, *An Seni Respublica gerenda sit* 787C

In Priene lived Bias son of Teutames, who is of more account than the rest.

(D. 39, M. 100) Diogenes Laertius I.88

What the Ephesians deserve is to be hanged to the last man, every one of them, and leave the city to the boys, since they drove out their best man, Hermodorus, saying ‘Let no one be the best among us; if he is, let him be so elsewhere and among others.’

(D. 121, M. 105) Strabo XIV.25 with Diogenes Laertius IX.2

One man is ten thousand, if he is the best.

(D. 49, M. 98) Theodorus Prodromus, *Epistulae* 1 (Migne p. 1240A)

The people must fight for the law as for their city wall.

(D. 44, M. 103) Diogenes Laertius IX.2

It is law also to obey the counsel of one.

(D. 33, M. 104) Clement, *Stromateis* V.115.2

It is not better for human beings to get all they want. It is disease that makes health sweet and good, hunger satiety, weariness rest.

(D. 110–11, M. 71 and M. 44) Stobaeus, III.1.176–7

[[For god all things are fair and good and just, but men have taken some things as unjust, others as just.]]

(D. 102, M. 91) *Scholia Graeca in Homeri Iliadem* ed. H. Erbse, I (1969), p. 445, on *Iliad* IV.4 (= Porphyry, *Quaestiones Homericae*, p. 69 Shrader)

If it were not for these things, they would not have known the name of Justice.

(D. 23, M. 45) Clement, *Stromateis* IV.9.7

The sea is the purest and foulest water: for fish drinkable and life-sustaining; for men undrinkable and deadly.

(D. 61, M. 35) Hippolytus, *Refutatio* IX.10.5

[[Asses prefer garbage to gold.]]

(D. 9, M. 37) Aristotle, *Nicomachean Ethics* X.5, 1176a6

[[Swine delight in mire more than clean water; chickens bathe in dust.]]

(D. 13, M. 36a¹) Clement, *Stromateis* 1.2.2

Doctors who cut and burn and torture their patients in every way complain that they do not receive the reward they deserve.

(D. 58, M. 46) Hippolytus, *Refutatio* IX.10.3

The path of the carding wheels is straight and crooked.

(D. 59, M. 32) Hippolytus, *Refutatio* IX.10.4

[[The counter-thrust brings together, and from tones at variance comes perfect attunement, and all things come to pass through conflict.]]

(D. 8, M. 27d¹=28c¹) Aristotle, *Nicomachean Ethics* VIII.1, 1155b4)

All beasts are driven by blows.

(D. 11, M. 80) [Aristotle], *De Mundo* 6, 401a10

[[Even the potion separates unless it is stirred.]]

(D. 125, M. 31) Theophrastus, *De Vertigine* 9

They do not comprehend how a thing agrees at variance with itself; it is an attunement turning back on itself, like that of the bow and the lyre.

(D. 51, M. 27) Hippolytus, *Refutatio* IX.9.2

The name of the bow is life; its work is death.

(D. 48, M. 39) *Etymologicum Magnum*, s.v.

The hidden attunement is better than the obvious one.

(D. 54, M. 9) Hippolytus, *Refutatio* IX.9.5

[[Homer was wrong when he said 'Would that Conflict might vanish from among gods and men!' (*Iliad* XVIII.107). For there would be no attunement without high and low notes nor any animals without male and female, both of which are opposites.]]

(D. A22, M.28c²) Aristotle, *Eudemian Ethics* VII.1, 235a25

One must realize that war is shared and Conflict is Justice, and that all things come to pass (and are ordained?) in accordance with conflict.

(D. 80, M. 28) Origen, *Contra Celsum* VI.28

War is father of all and king of all; and some he has shown as gods, others men; some he has made slaves, others free.

(D. 53, M. 29) Hippolytus, *Refutatio* IX.9.4

What awaits men at death they do not expect or even imagine.

(D. 27, M. 74) Clement, *Stromateis* IV.144.3

The great man is eminent in imagining things, and on this he hangs his reputation for knowing it all.

(D. 28A, M. 20) Clement, *Stromateis* V.9.3

Incredibility escapes recognition.

(D. 86, M. 12) Plutarch, *Coriolanus* 38 = Clement, *Stromateis* V.88.4

Justice will catch up with those who invent lies and those who swear to them.

(D. 28B, M. 19) Clement, *Stromateis* V.9.3

Corpses should be thrown out quicker than dung.

(D. 96, M. 76) Strabo XVI.26 = Plutarch, *Quaestiones Conviviales* IV.4.3, etc.

Death is all things we see awake; all we see asleep is sleep.

(D. 21, M. 49) Clement, *Stromateis* III.21.1

A man strikes a light for himself in the night, when his sight is quenched. Living, he touches the dead in his sleep; waking, he touches the sleeper.

(D. 26, M. 48) Clement, *Stromateis* IV.141.2

[[Men asleep are laborers and co-workers in what takes place in the world.]]

(D. 75, M. 1h²) Marcus Aurelius VI.42

Immortals are mortal, mortals immortal, living the others' death, dead in the others' life.

(D. 62, M. 47) Hippolytus, *Refutatio* IX.10.6

The same . . . : living and dead, and the waking and the sleeping, and young and old. For these transposed are those, and those transposed again are these.

(D. 88, M. 41) Pseudo(?)-Plutarch, *Consolatio ad Apollonium* 106E

Lifetime is a child at play, moving pieces in a game. Kingship belongs to the child.

XC (D. 52, M. 93) Hippolytus, *Refutatio* IX.9.4_n

[[A generation is thirty years, in which time the progenitor has engendered one who generates. The cycle of life lies in this interval, when nature returns from human seed-time to seed-time.]]

(D. A19, M. 108b¹) Plutarch, *De Defectu Oraculorum* 415E

Greater deaths are allotted greater destinies.

(D. 29, M. 95) Clement, *Stromateis* V.59.4

The best choose one thing in exchange for all, everflowing fame among mortals; but most men have sated themselves like cattle.

(D. 25, M. 97) Clement, *Stromateis* IV.49.2

Once born they want to live and have their portions; and they leave children behind born to become their dooms.

(D. 20, M. 99) *Ibid.* III.14.1

[[The beginning and the end are shared in the circumference of a circle.]]

(D. 103, M. 34) Porphyry, *Quaestiones Homericae*, on *Iliad* XIV.200

Gods and men honor those who fall in battle.

(D. 24, M. 96) Clement, *Stromateis* IV.16.1

To the soul belongs a report that increases itself.

(D. 115, M. 112) Stobaeus III.1.180a

For souls it is death to become water, for water it is death to become earth; out of earth water arises, out of water soul.

(D. 36, M. 66) Clement, *Stromateis* VI.17.2

The way up and down is one and the same.

(D. 60, M. 33) Hippolytus, *Refutatio* IX.10.4

One must quench violence quicker than a blazing fire.

(D. 43, M. 102) Diogenes Laertius IX.2

It is hard to fight against passion; for whatever it wants it buys at the expense of soul.

(D. 85, M. 70) Plutarch, *Coriolanus* 22.2; cf. Aristotle, *Eudemian Ethics* II.7, 1223b22, etc.

A man when drunk is led by a beardless boy, stumbling, not perceiving where he is going, having his soul moist.

(D. 117, M. 69) Stobaeus III.5.7

[[It is better to hide one's folly; but that is difficult in one's cups and at ease.]]

(D. 95, M. 110a⁸) Plutarch, *Quaestiones Convivales* 644F

[[It is delight, not death, for souls to become moist.]]

(D. 77, M. 66d¹) Porphyry, *De Antro Nympharum* 10 (Numenius fr. 30 des Places = fr. 35 Theodringa)

A gleam of light is the dry soul, wisest and best.

(D. 118, M. 68) Stobaeus III.5.8

(. . .) to rise up (?) and become wakeful watchers of living men and corpses.

(D. 63, M. 73) Hippolytus, *Refutatio* IX.10.6

[[Souls smell things in Hades.]]

(D. 98, M. 72) Plutarch, *De Facie in Orbe Lunae* 943E

[[If all things turned to smoke, the nostrils would sort them out.]]

(D. 7, M. 78) Aristotle, *De Sensu* 5, 443a21

[[The soul is an exhalation that perceives; it is different from the body, and always flowing.]]

CXIII A (D. A15) Aristotle, *De Anima* I.2, 405a25
(cf. 404b9)

Man's character is his fate.

(D. 119, M. 94) Stobaeus IV.40.23 = Plutarch, *Quaestiones Platonicae* 999E, etc.

The mysteries current among men initiate them into impiety.

(D. 14, M. 87) Clement, *Protrepticus* 22.2

If it were not Dionysus for whom they march in procession and chant the hymn to the phallus, their action would be most shameless. But Hades and Dionysus are the same, him for whom they rave and celebrate Lenaia.

(D. 15, M. 50) Clement, *Protrepticus* 34.5

They are purified in vain with blood, those polluted with blood, as if someone who stepped in mud should try to wash himself with mud. Anyone who noticed him doing this would think he was mad. And they pray to these images as if they were chatting with houses, not recognizing what gods or even heroes are like.

(D. 5, M. 86) *Theosophia* 68 (Erbse, *Fragmente griechischen Theosophien*, p. 184) plus Origen, *Contra Celsum* VII.62

The wise is one alone, unwilling and willing to be spoken of by the name of Zeus.

(D. 32, M. 84) Clement, *Stromateis* V.115.1

The thunderbolt pilots all things.

(D. 64, M. 79) Hippolytus, *Refutatio* IX.10.7

(Fire is?) need and satiety.

(D. 65, M. 79 and 55) Hippolytus, *Refutatio* IX.10.7

Fire coming on will discern and catch up with all things.

(D. 66, M. 82) *Ibid.*

How will one hide from that which never sets?

(D. 16, M. 81) Clement, *Paedagogus* II.99.5

The god: day and night, winter and summer, war and peace, satiety and hunger. It alters, as when mingled with perfumes, it gets named according to the pleasure of each one.

(D. 67, M. 77) Hippolytus, *Refutatio* IX.10.8

Grasping: wholes and not wholes, convergent divergent, consonant dissonant, from all things one and from one thing all.

(D. 10, M. 25) [Aristotle], *De Mundo* 5, 396b20

[[The fairest order in the world is a heap of random sweepings.]]

(D. 124, M. 107) Theophrastus, *Metaphysica* 15 (p. 16, Ross and Fobes)

STUDY QUESTIONS: HERACLITUS

1. What does Heraclitus think people fail to comprehend?
2. How are we asleep, even while awake, according to Heraclitus?
3. What does Heraclitus mean by saying that 'the account is shared'? What does this have to do with being awake?
4. 'Whatever comes from sight . . . this I prefer.' What does Heraclitus mean? (8)
5. 'Eyes and ears are poor witnesses for men if their souls do not understand the language.' Why does he think that this is true?
6. What does Heraclitus say about thinking well? What argument might he give for saying that?
7. He says that 'the ordering' is 'the same for all.' What is this ordering in the universe and why does he emphasize that it is the same for all persons? (17)
8. Why does Heraclitus claim 'the way up and down is one and the same'?

9. What is the *logos* or principle underlying all change according to Heraclitus?
10. What does Heraclitus mean by asserting that one cannot step into the same river twice? What does he say immediately after this famous saying?
11. Does Heraclitus believe that there are substances? What would it mean to deny that any substances exist?
12. Quite apart from Heraclitus, what reasons are there for thinking that substances do not exist?
13. Why does Heraclitus claim that ‘asses prefer garbage to gold’?
14. What does Heraclitus say about attunement and the bow? What does the bow stand for?

THE ELEATICS

PROLOGUE

The Eleatics gave natural philosophy a tremendous shock. They challenged the very idea of such a project, and argued for a mystical, antinaturalistic view of the universe. What is surprising about their thought is the strength of their arguments. They appear to be sound.

PARMENIDES (515–445 B.C.)

Biographical History

Parmenides was born in Elea, a Greek city in southern Italy. He was reportedly a student of Xenophanes, and may have studied with the Pythagoreans, but he followed neither. He wrote a long poem in Homeric hexameters, of which about 150 lines have been recovered. This poem radically changed philosophy. It is divided into two parts: the first describes the Way of Truth, and the second the Way of Opinion, which characterizes a false and deceitful manner of thinking.

Philosophical Overview

Parmenides’ view seems to be that there can only be one thing or, in other words, that all plurality is an illusion. From the text it seems that the argument for this conclusion is based on the premise that we cannot speak of or think about that which does not exist. Every subject of inquiry and thought must exist. In contemporary terms, one cannot think about what does not exist because if one can refer to something, then it exists. From this conclusion, Parmenides seems to argue that change is impossible because change requires that either something comes from nothing, or that something comes to not exist, both of which are impossible. The argument is as follows:

1. *The concept of the nonexistent is impossible.*
 2. *The idea of change requires the concept of the nonexistent.*
-
3. *Therefore, change is impossible.*

As a consequence, what exists must be unchanging and eternal, possibly in the sense of being timeless. Furthermore, since it is impossible to think about what does not exist, the existent must be seamless or without gaps because the idea of gaps presupposes the nonex-

istent, which is impossible. In this way, Parmenides argues that the whole is not divisible. It has no parts.

Notice that Parmenides' poem does not contain an argument against the existence of empty space, from which also he could have concluded that motion is impossible. Such an argument was given in fact by his follower Melissus.

This poem was a watershed in the history of early western philosophy. It had great influence on later generations, but, of course, it apparently meant that the scientific investigation of nature is impossible, or at best is only a study of illusions. The great challenge was now to overcome the arguments in favor of Parmenides' strange position.

Parmenides' Poem

In his poem, Parmenides journeys to the House of Night, where he meets the goddess of wisdom, who shows him the truth through argument. In the Way of Truth, the goddess argues for a seamless, changeless, finite universe. In effect, she argues that there can only be one thing or, in other words, that all plurality is an illusion.

The second half of the poem (8.51–8.61 and 9 and 10) outlines the Way of Seeming, which describes the erroneous views of mortals, who mistake appearances for reality. Parmenides' position in the first part of the poem apparently implies that all sense perception is illusory and, furthermore, that the true nature of reality is revealed by reason. However, it is a contended point how one should understand the relation between the two parts of the work.

FRAGMENTS

Parmenides

1.

*The mares that carry me, as far as impulse might reach,
Were taking me, when they brought and placed me
upon the much-speaking route
Of the goddess, that carries everywhere unscathed the
man who knows;
4 Thereon was I carried, for thereon the much-guided
mares were carrying me, . . .
And the goddess received me kindly, and took my right
hand with her hand,
And uttered speech and thus addressed me:
'Youth attended by immortal charioteers,
25 Who come to our House with mares that carry you,
Welcome; for it is no ill fortune that sent you forth to
travel
This route (for it lies far indeed from the beaten track of
men),
But right and justice. And it is right that you should
learn all things,*

*Both the steadfast heart of persuasive truth,
30 And the beliefs of mortals, in which there is no true trust.
But nevertheless you shall learn these things as well,
how the things which seem
Had to have genuine existence, permeating all things
completely.'*

1–30: Sextus Empiricus, *Against the Mathematicians*
VII. 111–14

28–32: Simplicius, *Commentary on De Caelo*
(*Comm. Arist. Gr.* VII, 557)

2.

*Come, I shall tell you, and do you listen and convey
the story,
What routes of inquiry alone there are for thinking:
The one—that [it] is, and that [it] cannot not be,
Is the path of Persuasion (for it attends upon truth);
5 The other—that [it] is not and that [it] needs must
not be,*

*That I point out to you to be a path wholly unlearnable,
For you could not know what-is-not (for that is not
feasible),*

Nor could you point it out.

1–8: Proclus, Commentary on *Timaeus* (Diehl, vol I, 345)
3–8: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 116)

3.

*. . . because the same thing is there for thinking and for
being.*

Clement *Miscellanies* V1. 2, 23; Plotinus *Ennead* V. 1.8

The Way of Truth

4.

*Look upon things which, though far off, are yet firmly
present to the mind;*

*For you shall not cut off what-is from holding fast to
what-is,*

*For it neither disperses itself in every way everywhere
in order,*

Nor gathers itself together.

Clement *Miscellanies* V. 2, 15

5.

And it is all one to me

Where I am to begin; for I shall return there again.

Proclus, Commentary on *Parmenides* (Cousin 708)

6.

*It must be that what is there for speaking and thinking
of is; for [it] is there to be*

Whereas nothing is not; that is what I bid you consider,

For <I restrain> you from that first route of inquiry,

*And then also from this one, on which mortals
knowing nothing*

5 *Wander, two-headed; for helplessness in their
Breasts guides their distracted mind; and they are carried
Deaf and blind alike, dazed, uncritical tribes,
By whom being and not-being have been thought both
the same*

*And not the same; and the path of all is backward-
turning.*

1–9: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 117)

8–9: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 78)

7.

*For never shall this prevail, that things that are not are;
But do you restrain your thought from this route of
inquiry,*

*Nor let habit force you, along this route of much-
experience,*

To ply an aimless eye and ringing ear

5 *And tongue; but judge by reasoning the very
contentious disproof*

That has been uttered by me.

1–2: Plato, *Sophist* 237a

1: Aristotle, *Metaphysics* N2, 1089a2

3–6: Sextus Empiricus,
Against the Mathematicians VII.144

8.

A single story of a route still

*Is left: that [it] is; on this [route] there are signs
Very numerous: that what-is is ungenerated and
imperishable;*

Whole, single-limbed, steadfast, and complete;

5 *Nor was [it] once, now will [it] be, since [it] is, now, all
together,*

*One, continuous; for what coming-to-be of it will you
seek?*

*In what way, whence, did [it] grow? Neither from
what-is-not shall I allow*

*You to say or think; for it is not to be said or thought
That [it] is not. And what need could have impelled it
to grow*

10 *Later or sooner, if it began from nothing?*

Thus [it] must either be completely or not at all.

*Nor will the strength of trust ever allow anything to
come-to-be from what*

*Besides it; therefore neither [its] coming-to-be
Nor [its] perishing has Justice allowed, relaxing her
shackles,*

15 *But she holds [it] fast; the decision about these matters
depends on this:*

*Is [it] or is [it] not? but it has been decided, as is
necessary,*

*To let go the one as unthinkable, unnameable (for it is
no true*

*Route), but to allow the other, so that it is,
and is true.*

*And how could what-is be in the future; and how could
[it] come-to-be?*

20 For if [it] came-to-be, [it] is not, nor [is it] if at some
time [it] is going to be.
Thus, coming-to-be is extinguished and perishing not to
be heard of.
Nor is [it] divisible, since [it] all alike is;
Nor is [it] somewhat more here, which would keep it
from holding together,
Nor is [it] somewhat less, but [it] is all full of what-is.
25 Therefore [it] is all continuous; for what-is is in contact
with what-is.
Moreover, changeless in the limits of great chains
[It] is un-beginning and unceasing, since coming-to-be
and perishing
Have been driven far off, and true trust has thrust
them out.
Remaining the same and in the same, [it] lies by itself
30 And remains thus firmly in place; for strong Necessity
Holds [it] fast in the chains of a limit, which fences it
about.
Wherefore it is not right for what-is to be incomplete;
For [it] is not lacking; but if [it] were, [it] would lack
everything.
The same thing is for thinking and [is] that there is
thought;
35 For not without what-is, on which [it] depends, having
been declared,
Will you find thinking; for nothing else <either> is or
will be
Besides what-is, since it was just this that Fate did
shackle
To be whole and changeless; wherefore it has been
named all things
That mortals have established, trusting them to be true,
40 To come-to-be and to perish, to be and not to be,
And to shift place and to exchange bright colour.
Since, then, there is a furthest limit, [it] is completed,
From every direction like the bulk of a well-rounded
sphere,
Everywhere from the centre equally matched; for [it]
must not be any larger
45 Or any smaller here or there;
For neither is there what-is-not, which could stop if
from reaching
[Its] like, nor is there a way in which what-is could be
More here and less there, since [it] all inviolably is;
For equal to itself from every direction, [it] lies
uniformly within limits.

The Way of Belief

50 Here I stop my trustworthy speech to you and thought
About truth; from here onwards learn mortal beliefs,
Listening to the deceitful ordering of my words;
For they established two forms in their minds for
naming,
Of which it is not right to name one—wherein they
have gone astray —
55 And they distinguished opposites in body and
established signs
Apart from one another: here, on the one hand,
aetherial fire of flame,
Which is gentle, very light, everywhere the same as itself,
But not the same as the other; but on the other hand,
that one too by itself
In contrast, dark night, a dense and heavy body;
60 All this arrangement I proclaim to you as plausible;
Thus no opinion of mortals shall ever overtake you.

1–52: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 144)

1–14: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 78)

50–61: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 38)

53–59: Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 179)

9.

But since all things have been named light
and night,
And these [have been applied] according to their powers
to these things and to those,
All is full of light and obscure night together,
Of both equally, since for neither [is it the case that]
nothing shares in them.

Simplicius, Commentary on *Physics*
(Comm. Arist. Gr. IX, 180)

10.

And you shall know both the nature of the aether
and all
The signs in the aether, the destructive works of the
splendid sun's
Pure torch, and whence they came-to-be,
And you shall learn the wandering works of the round-
eyed moon,
5 And its nature, and you shall also know the surrounding
sky,

Whence it grew and how Necessity did guide and
shackle it
To hold the limits of the stars.

Clement *Miscellanies* V. 14, 138

11.

How earth and sun and moon
And the common aether and Milky Way and the
outermost heaven
And the hot strength of the stars did thrust forward
To come-to-be

Simplicius, *Commentary on De Caelo*
(*Comm. Arist. Gr.* VII, 559)

12.

For the narrower [rings] are filled with
unmingled fire,
And those next upon them with night, and a portion of
flame is sent forth;
In the midst of these is the goddess who steers
all things;
For she rules over hateful birth and union of
all things,
5 Sending female to mingle with male, and again
conversely
Male with female . . .

1–3: Simplicius, *Commentary on Physics*
(*Comm. Arist. Gr.* IX, 39)

2–6: Simplicius, *Commentary on Physics*
(*Comm. Arist. Gr.* IX, 31)

13.

She devised Love first of all the gods. . . .

Plato *Symposium* 178b; Aristotle *Metaphysics*
A4, 984b23; Plutarch *Amatorius*
756f; Simplicius, *Commentary on Physics*
(*Comm. Arist. Gr.* IX, 39)

14.

Night-shiner, wandering around the earth, an alien light
Plutarch *Reply to Colotes* 1116a

15.

Always looking towards the rays of the sun
Plutarch *On the Face of the Moon* 929a;
Quaestiones Romanae 282b

16.

For as each man has a union of the much-wandering
limbs,
So is mind present to men; for it is the same thing
Which the constitution of the limbs thinks,
Both in each and every man; for the full is thought.

Aristotle *Metaphysics* Γ5, 1009b21; Theophrastus *On Sense*
1–4 (*Dox. Gr.* 499–500)

17.

<She placed> young males on the right side [of the
womb], young females on the left.

Galen, *Commentary on Sixth Book of Hippocrates' Epi-*
demics II.46 (Kuhn 1002; Wenkebach-Pfaff 119)

18.

When man and woman mingle the seeds of love
That spring from their veins, a formative power
Maintaining proper proportions moulds well-formed
bodies from this diverse blood.
For if, when the seed is mingled, the forces
therein clash

5 And do not fuse into one, then cruelly
Will they plague with double seed the sex of the
offspring.

Caelius Aurelianus *On Chronic Diseases* IV.9

19.

Thus according to belief, these things were born and
now are
And hereafter, having grown from this, they will come
to an end,
And for each of these did men establish a distinctive
name.

Simplicius, *Commentary on De Caelo*
(*Comm. Arist. Gr.* VII, 558)

20.

Cornford's Fragment
Such, changeless, is that for which as a whole the name
is: 'to be.'

Plato *Theaetetus* 180e;
Simplicius, *Commentary on Physics*
(*Comm. Arist. Gr.* IX, 29, 16–18, 143, 10)

STUDY QUESTIONS: PARMENIDES

1. What does Parmenides claim can be said of 'The one'? Why is it indivisible and changeless?
2. How does Parmenides distinguish being from nonbeing?
3. What does Parmenides mean by 'the nothing'? Why does he say that 'nothing is not'?
4. How does Parmenides answer the question 'how could what-is be in the future'? What is there to prevent it?
5. Why is the ordering of his words deceitful (8. L. 52)? Is there any way to avoid that?
6. Can the way the world is according to belief and the One be reconciled? Are they two separate worlds? Why not?
7. What does Parmenides mean by 'the aether'?
8. What is the basis of Parmenides' claim that all change is impossible?
9. How does Parmenides define 'change'?
10. What would Parmenides say to the Milesians' way of doing philosophy? To Pythagoras?
11. What implications does Parmenides' view have for the distinction and the relationship between philosophy and science?

ZENO (490–430 B.C.)**Biographical History**

Zeno came from Elea. He was about 25 years younger than Parmenides, and they may have been lovers. In 450 B.C., they visited Athens together and probably met with Socrates, who was about 20 years old. Plato's dialogue *Parmenides* reconstructs these fascinating discussions. We know little else about Zeno's life except that, after participating in a rebellion to overthrow a tyrant, he was captured and, despite being tortured, he refused to betray his companions.

Philosophical Overview

With his so-called paradoxes, Zeno made the challenge of Parmenides even greater. 'Zeno's Paradoxes' are not really paradoxes at all; a paradox is an apparently inescapable contradiction. They are arguments, which are designed to prove the startling conclusion that motion is impossible. In this way, Zeno aimed to support Parmenides' conclusion that there is only one thing, and to deny the existence of a plurality. We are told that Zeno had 40 such arguments in his work *Attacks*, but of these, only six survive. Four of these are his famous arguments against motion, stated by Aristotle in his *Physics*, quoted in the first passage below. The four arguments are the midway problem, Achilles, the arrow, and the stadium. Zeno's basic strategy is to show that the commonsense view that more than one thing exists leads to absurdities or contradictions, thereby supporting Parmenides' claim that only one thing can exist. The Achilles paradox is essentially similar in form to the midway problem, which we shall now examine.

The Midway Problem

Imagine that you have to cross a room by traveling half of the distance across it, then half of the remaining distance, half of the remaining distance, and so on. You will never

actually cross the room. The journey cannot be completed. However, the argument applies to any journey, and therefore no journey or movement can even begin. In effect, he argues as follows:

1. *For anything to move requires its completing an infinite number of tasks.*
 2. *It is impossible to complete an infinite number of tasks.*
-
3. *Therefore, movement is impossible.*

According to the first premise, moving requires an infinite number of tasks because space is continuous, and hence infinitely divisible. This means that, between any two points, there are an infinite number of points. This in turn implies that to move between any two points requires completing an infinite number of steps or tasks. Concerning the second premise, it may seem that Zeno's point is that it is impossible to complete an infinite number of tasks in a finite time. However, his real point is rather that it is impossible to complete an infinite series because an infinite series has no last member.

The Arrow

Imagine an arrow flying through space. Zeno argues the following:

1. *At any moment, the arrow occupies a space that is equal to its own size.*
 2. *Something that occupies a space equal to its own size is at rest.*
-
3. *Therefore, at any moment, the arrow is at rest.*

This conclusion can be generalized to show that no motion is possible.

The Stadium (or Moving Rows)

There are different interpretations of the details of this argument, but they agree on its basic form. There are three groups of blocks, all of equal size. Group A is stationary. The two remaining groups move with equal speed in opposite directions. Let us suppose that each group has two blocks. After a period of time T , one of the B blocks has moved past all two C's and only one of the A's. Hence, the following argument applies.

1. *Block B1 moves past a single A in time T .*
 2. *Block B1 moves past two C's in time T .*
 3. *Blocks A, B, and C are equal in size.*
 4. *Blocks C and B move with equal speed.*
 5. *Time = distance divided by velocity.*
-
6. *Therefore, $T = 1/2 T$.*

From this absurd consequence, Zeno concludes that motion is impossible.

The Other Arguments

There are other extant arguments of Zeno, among which the following is perhaps the most famous. Any thing X is the same as itself, and if something were to be added to it, then it would not be X but rather X + Y. Everything must have magnitude. However, anything

with magnitude is divisible into parts, and whenever it is divided, there will remain a part still to be divided. Therefore, everything that exists is $X + Y$. This argument can be repeated indefinitely. Therefore, if there were many things, they would be either infinitely large or infinitely small.

Zeno's Fragments

The fragment is from Aristotle, who gives Zeno's four arguments. However, Aristotle contends that they are fallacious because they rely on the false view that time is composed of indivisible instants. It is a debated point whether this is a correct or fair way to understand Zeno's arguments.

FRAGMENTS

Zeno

1.

Zeno argues fallaciously. For if, he says, everything is always at rest when it is in a space equal to itself, and if what is travelling is always in such a space at any instant, then the travelling arrow is motionless. That is false; for time is not composed of indivisible instants—nor is any other magnitude.

Zeno's arguments about motion which provide trouble for those who try to resolve them are four in number.

The first maintains that nothing moves because what is travelling must first reach the half-way point before it reaches the end. We have discussed this earlier.

The second is the so-called Achilles. This maintains that the slowest thing will never be caught when running by the fastest. For the pursuer must first reach the point from which the pursued set out, so that the slower must always be ahead of it. This is the same argument as the dichotomy, but it differs in that the additional magnitudes are not divided in *half*. Now it follows from the argument that the slower is not caught, and the same error is committed as in the dichotomy (in both arguments it follows that you do not reach the end if the magnitude is divided in a certain way—but here there is the additional point that not even the fastest runner in fiction will reach his goal when he pursues the slowest); hence the solution must also be the same. And it is false to claim that

the one ahead is not caught: it is not caught *while it is ahead*, but nonetheless it is caught (provided you grant that they can cover a finite distance).

Those, then, are two of the arguments. The third is the one we have just stated, to the effect that the travelling arrow stands still. It depends on the assumption that time is composed of instants; for if that is not granted the inference will not go through.

The fourth is the argument about the bodies moving in the stadium from opposite directions, an equal number past an equal number; the one group starts from the end of the stadium, the other from the middle; and they move at equal speed. He thinks it follows that half the time is equal to its double. The fallacy consists in claiming that equal magnitudes moving at equal speeds, the one past a moving object and the other past a stationary object, travel for an equal length of time. But this is false.

For example, let the stationary equal bodies be AA; let BB be those beginning from the middle, equal in number and in magnitude to them; and let CC be those beginning from the end, equal in number and in magnitude to them and equal in speed to the Bs. It follows that, as they move past one another, the first B and the first C are at the end at the same time. And it follows that the C has travelled past all of them but the B past half of them. Hence the time is half—for each of the two is alongside each for an equal time. At the same time it follows that the first

B has travelled past all the Cs; for the first C and the first B will be at opposite ends at the same time (being, as he says, alongside each of the Bs for a time equal to that for which it is alongside each of the As)—because both are alongside the As for an equal time. That is the argument, and it rests upon the falsity we have mentioned.

(Aristotle, *Physics* 239b5–240a18)

2.

But in his treatise, which contains many arguments, he shows in each case that anyone who says that several things exist falls into inconsistencies.

There is one argument in which he shows that if several things exist they are both large and small—so large as to be infinite in magnitude, so small as to have no magnitude at all. Here he shows that what has no magnitude, no mass, and no bulk, does not even exist. For, he says,

if it were added to anything else, it would not make it larger. For if it is of no magnitude but is added, [the other thing] cannot increase at all in magnitude. Thus what is added will therefore be nothing. And if when it is subtracted the other thing is no smaller—and will not increase when it is added again—then clearly what was added and subtracted was nothing. [29 B 2]

Zeno says this not to do away with the one but in order to show that the several things each possess a magnitude—a magnitude which is actually infinite by virtue of the fact that, because of infinite divisibility, there is always something in front of whatever is taken. And he shows this having first shown that they possess no magnitude from the fact that each of the several things is the same as itself and one. Zeno seems rather to say that there do not exist several things.

From Simplicius, *Commentary on the Physics* 138.3–6, 138.29–140.6, 140.18–141.11

3.

Porphiry holds that the argument from dichotomy belonged to Parmenides who attempted to show by it that what exists is one. He writes as follows:

Parmenides had another argument, the one based on dichotomy, which purports to show that

what exists is one thing only and, moreover, partless and indivisible. For were it divisible, he says, let it have been cut in two—and then each of its parts in two. Since this goes on for ever, it is clear, he says, that either some final magnitudes will remain which are minimal and atomic and infinite in number, so that the whole thing will be constituted from infinitely many *minima*; or else it will disappear and be dissolved into nothing, and so be constituted from nothing. But these consequences are absurd. Therefore it will not be divided but will remain one. Again, since it is everywhere alike, if it is really divisible it will be divisible everywhere alike, and not divisible in one place and not in another. Then let it have been divided everywhere. It is clear, again, that nothing will remain but that it will disappear; and if it is constituted at all, it will again be constituted from nothing. For if anything remains, it will not yet have been divided everywhere. Thus from these considerations too it is evident, he says, that what exists will be indivisible and partless and one. . . .

Porphiry is right here to refer to the argument from dichotomy as introducing the indivisible one by way of the absurdity consequent upon division; but it is worth asking whether the argument is really Parmenides' rather than Zeno's, as Alexander thinks. For nothing of the sort is stated in the Parmenidean writings, and most scholars ascribe the argument from dichotomy to Zeno—indeed it is mentioned as Zeno's in Aristotle's work *On Motion* [i.e. *Physics* 239b9]. And why say more when it is actually found in Zeno's own treatise? For, showing that if several things exist the same things are finite and infinite, Zeno writes in the following words:

If several things exist, it is necessary for them to be as many as they are, and neither more nor fewer. But if they are as many as they are, they will be finite. If several things exist, the things that exist are infinite. For there are always others between the things that exist, and again others between them. And in this way the things that exist are infinite. [B 3]

And in this way he has proved infinity in quantity from the dichotomy. As for infinity in magnitude, he

proved that earlier in the same argument. For having first proved that if what exists had no magnitude it would not even exist, he continues:

But if it exists, it is necessary for each thing to have some bulk and magnitude, and for one part of it to be at a distance from the other. And the same argument applies to the protruding part. For that too will have a magnitude, and part of it will protrude. Now it is all one to say this once and to say it for ever. For it will have no last part of such a sort that there is no longer one part in front of another. In this way if there exist

several things it is necessary for them to be both small and large—so small as not to have a magnitude, so large as to be infinite. [B 1]

Perhaps, then, the argument from dichotomy is Zeno's, as Alexander holds, but he is not doing away with the one but rather with the many (by showing that those who hypothesize them are committed to inconsistencies) and is thus confirming Parmenides' argument that what exists is one.

(Simplicius, *Commentary on the Physics* 138.3–6, 138.29–140.6, 140.18–141.11)

STUDY QUESTIONS: ZENO

1. Could you refute Zeno's paradox of motion by walking across the room? Why?
2. What is the midway problem?
3. What is the paradox of Achilles?
4. According to Zeno, why is it impossible for an arrow to move?
5. Is Aristotle right to contend that Zeno assumes that time is composed of indivisible instants? How would Zeno's arguments hinge on such an assumption? How might they escape it?
6. In principle, could an argument prove that it is impossible for several things to exist? Could the senses be wrong in suggesting that there are many things? If the senses and reasoning were to conflict in this way, what should one do?
7. How does Zeno argue that if there are many things, then they will be both infinitely large and infinitely small?
8. What was Parmenides' argument for the claim that nothing could be divisible?
9. What objections might there be to the claim that everything is one? Are these objections answerable?

THE ATOMISTS

PROLOGUE

Democritus continued to think philosophically about nature, more or less in accord with the earlier Milesian tradition. To do so, he had to respond to the challenge of Parmenides and Zeno. Democritus, following his teacher Leucippus, advanced an atomistic theory of nature. The world consists of indivisible physical atoms. Leucippus is said to have written two books, *On the Mind* and *The Great World System*, but no fragments of his work remain and almost nothing is known about his life. Nevertheless, his atomism was expounded by Democritus, and is explained by Aristotle and other later ancient writers, such as Simplicius.

DEMOCRITUS (470–360 B.C.)

Biographical History

Democritus was born in Abdera in Thrace in northern Greece. During his long life, he traveled widely in the ancient world, although the reports that he visited India are probably false. He was a pupil of Leucippus, who was the first atomist. The Greek word ‘atomos’ means something that cannot be cut or divided. Allegedly, Democritus lived to the age of 110, and he was one year older than Socrates. He was a prolific writer. Diogenes Laertius lists over 60 works written by Democritus, including his famous *Maxims*. His interests extended far beyond natural philosophy and atomism. He discussed the nature of humans as cultural and social beings, what we would call today anthropological studies. He wrote treatises on poetry, mathematics, and various technical matters, such as farming, diets, medical judgment, and military tactics. He also wrote nine works on moral and political philosophy.

Philosophical Overview

According to Democritus, space is infinite in extent, and there are an infinite number of bodies. However, those bodies are not infinitely divisible; they are indivisible atoms. These atoms have a size and a shape, and they are solid. Sometimes, when they collide, the atoms cohere together to form more complex compound bodies. In this way, they form the building blocks of everything we perceive. However, individual atoms lack properties such as taste, color, and smell (which John Locke later called the secondary qualities).

Democritus claimed that atoms cannot be destroyed and are unchangeable. In this respect, Parmenides was right. Each atom is like an unchanging Parmenidean world. However, in opposition to Parmenides, Democritus argued that these atoms are constantly moving and that, through this motion, they constitute our familiar world. To support this claim, Democritus argued directly against Parmenides’ premise that we cannot refer to what does not exist. According to Democritus, the nonexistent is no more than empty space or a vacuum, about which we can speak and think. Everything that exists is composed of atoms that occupy and fill that otherwise empty space, and, because of this, anything that does not exist must be identical to empty space.

One of the most remarkable features of Democritus’ philosophy is his theory of perception. Diogenes Laertius cites works by Democritus on flavors, colors, and shapes, as well as a general treatise on the senses. Democritus realized that his atomism has dramatic implications for perception. The only real things are atoms. Since these are colorless, color and other similar perceptual properties must be illusions. Consequently, our senses continually deceive us; the world itself is very different from how we perceive it to be.

Democritus’ Fragments

This reading consists of five fragments. The first four outline Democritus’ atomism, which was summarized in the Philosophical Overview. Notice how our knowledge of Democritus’ physics relies heavily on Aristotle. The fourth and fifth selections indicate Democritus’ views on perception.

FRAGMENTS

Democritus

1.

Democritus thinks that the nature of eternal things consists in small substances, infinite in quantity, and for them he posits a place, distinct from them and infinite in extent. He calls place by the names ‘void’, ‘nothing’ and ‘infinite’; and each of the substances he calls ‘thing’, ‘solid’ and ‘being’. He thinks that the substances are so small that they escape our senses, and that they possess all sorts of forms and all sorts of shapes and differences in magnitude. From them, as from elements, he was able to generate and compound visible and perceptible bodies. The atoms struggle and are carried about in the void because of their dissimilarities and the other differences mentioned, and as they are carried about they collide and are bound together in a binding which makes them touch and be contiguous with one another but which does not genuinely produce any other single nature whatever from them; for it is utterly silly to think that two or more things could ever become one. He explains how the substances remain together in terms of the ways in which the bodies entangle with and grasp hold of one another; for some of them are uneven, some hooked, some concave, some convex, and others have innumerable other differences. So he thinks that they hold on to one another and remain together up to the time when some stronger force reaches them from their environment and shakes them and scatters them apart. He speaks of generation and of its contrary, dissolution, not only in connection with animals but also in connection with plants and worlds—and in general with all perceptible bodies. [Aristotle, fragment 208]

(Simplicius, *Commentary on On the Heavens* 294.30–295.22)

2.

Leucippus and his colleague Democritus say that the full and the void are elements, calling the one ‘being’ and the other ‘non-being’; and of these the full and solid is being, the void non-being (that is why they say that being no more exists than non-being—

because void no more exists than body), and these are the material causes of the things that exist. And just as those who make the underlying substance single generate other things by its properties, making the rare and the dense origins of the properties, so these men say that the differences [among the atoms] are the causes of the other things. They say that the differences are three in number—shape, order, and position. For they say that beings differ only by ‘rhythm’, ‘contact’ and ‘mode’—where rhythm is shape, contact is order and mode is position. The letter A differs from N in shape; AN differs from NA in order; and N differs from Z in position. As for motion (whence and how existing things acquire it), they too, like the others, negligently omitted to inquire into it.

(Aristotle, *Metaphysics* 985b4–20)

3.

Democritus seems to have been persuaded by appropriate and scientific arguments. What I mean will be clear as we proceed.

There is a difficulty if one supposes that there is a body or magnitude which is divisible everywhere and that this division is possible. For what will there be that escapes the division? If it is divisible everywhere, and the division is possible, then it might be so divided at one and the same time even if the divisions were not all made at the same time; and if this were to happen no impossibility would result. So if it is by nature everywhere divisible, then if it is divided—whether at successive mid-points or by any other method—nothing impossible will have come about. (After all, if it were divided a thousand times into a thousand parts, nothing impossible would result, even though no-one would actually so divide it.)

Now since the body is everywhere divisible, suppose it to have been divided. What will be left? A magnitude? That is not possible; for then there will be something that has not been divided, but we supposed it divisible everywhere. But if there is to be no body or magnitude left and yet the division is to take place, it will either consist of points and its

components will have no magnitude, or else they will be nothing at all so that it would come to be, and be composed, from nothing and the whole body would be nothing but an appearance.

Similarly, if it is made of points it will not be a quantity. For when the points were in contact and were a single magnitude and were together, they did not make the whole at all larger. For if it is divided into two or more parts the whole is no smaller or larger than it was before, so that even if all the points are put together they will not make any magnitude.

If some sawdust, as it were, is created when the body is being divided, and in this way some body escapes from the magnitude, the same argument applies: how is *this* body divisible?

Perhaps it is not a body but a separable form or property which escapes, and the magnitude consists of points or contacts with such and such a property? But it is absurd to think that a magnitude consists of what are not magnitudes.

Again, where will these points be, and are they motionless or moving?

And a single contact always involves two things, so that there is something apart from the contact and the division and the point.

If one posits that any body of whatever size is everywhere divisible, all these things follow.

Again, if I divide a log or anything else and then put it together, it is again a unit of the same size. This is so at whatever point I cut the log. So it has potentially been divided everywhere. Then what is there apart from the division? Even if it has properties, how is the body dissolved into these and how does it come into being from them? And how are they separated? So if it is impossible for magnitudes to consist of contacts or points, necessarily there are indivisible bodies and magnitudes.

(Aristotle, *On Generation and Corruption* 316a13–b16)

4.

And even more in his second accusation [Colotes] fails to notice that he drives Epicurus out of life along with Democritus. For Democritus' claim—by convention colour and by convention sweet and by convention compounds, etc, in reality the void and the atoms [cf B 125]—was, he says, an attack on the senses; and he holds that anyone who sticks by this argument and uses it cannot even think that he is himself a man and alive.

But what does Democritus say?—That substances infinite in quantity, indivisible and indestructible, and also qualityless and impassive, are carried about scattered in the void. When they approach one another or collide or are entangled, the aggregates *appear* as water or fire or plants or men, but all things really *are* what he calls these indivisible forms and nothing else. For there is no generation from what does not exist, while from the things that exist nothing can be generated in virtue of the fact that, because of their hardness, the atoms neither are affected nor change. Hence no colour can emerge from things which are colourless, and no nature or soul from things which are qualityless and impassive.

(Plutarch, *Against Colotes* 1110F–1111A)

5.

Democritus sometimes does away with what appears to the senses and says that nothing of this sort appears in truth but only in opinion, truth among the things that exist lying in the fact that there are atoms and void. For he says:

By convention sweet and by convention bitter, by convention hot, by convention cold, by convention colour: in reality atoms and void. [cf B 125]

That is to say, objects of perception are thought and believed to exist but they do not exist in truth—only atoms and void do.

STUDY QUESTIONS: DEMOCRITUS

1. Why, according to Democritus, are 'being' and 'non-being' elements?
2. Why does he think that atoms are indivisible? Why are they infinite in number?
3. What is the absurd consequence if magnitude consists of points?
4. How do substances remain together, according to Democritus?
5. What are the three differences between atoms? How does Aristotle in his commentary employ the letters 'A,' 'N,' and 'Z' to illustrate these differences?
6. How does Democritus ascertain the properties of atoms?

7. If, as Democritus claims, only atoms and the void exist, what accounts for appearances?
8. Why does Democritus claim ‘by convention sweet and by convention bitter’? What is the next part of this quotation?
9. What is Democritus’ view of sense-perception?
10. In what way are Democritus’ beliefs regarding atoms different from contemporary atomic theory?
11. How would Democritus reply to the arguments of Parmenides? Are they adequate replies?

THE SOPHISTS

PROLOGUE

The Sophists do not constitute a school of thought in the way that the Milesians do. They are individual thinkers who shared a common general outlook rather than specific claims. It was more of a movement than a school. The Sophists included Protagoras, Gorgias, Hippias, and Antiphon, among many others. They had a critical attitude to prevailing moral and religious beliefs, and they articulated cultural relativism. Sophists claimed that there are no objectively true moral claims, and that moral beliefs arise solely through social convention. They contrasted convention (*nomos*) with the objectivity of nature (*phusis*).

Sophism resulted in part because of the increasing prosperity and political sophistication of Athens in the fifth century B.C. This led to a demand for forms of education that went beyond the elementary training in literature, music, arithmetic, and gymnastics offered in the schools of the time. In response, the Sophists worked as traveling teachers, offering instruction in rhetoric and persuasion, and transmitting their analyses of morality and politics.

Following Plato, some writers tend to portray the Sophists as superficial thinkers who taught for financial gain. However, the term ‘sophist’ originally came from the word ‘*sophia*,’ meaning wisdom. The Sophists were regarded as people of wisdom. However, later the term ‘Sophist’ became associated with the word ‘*sophon*,’ which means cleverness. In this way, the Sophists came to be portrayed as purveyors of cleverness, rather than philosophers, lovers of wisdom.

PROTAGORAS (490–420 B.C.)

Biographical History

Protagoras was the first Sophist. He came from Abdera, an Ionian colony on the coast of Thrace. As a child, he may have been educated by the Persians. As a young man, he went to live in Athens, and in 443 B.C., he was asked by Pericles to form a constitution for a colony in southern Italy. He knew Democritus. Although he probably wrote 18 works (12 of which are listed by Diogenes Laertius), there only remain a few sentences and phrases of these works. However, Plato discusses Protagoras’ thoughts at length, especially in the dialogues, *Protagoras* and *Theaetetus*. From these and other sources, it is possible tentatively to reconstruct his philosophy.

Philosophical Overview

Protagoras is well known for his claim that man is the measure of all things. This saying raises many questions of interpretation. Does it mean humans as a species or individual people? Does it mean *that* things are or *how* they are? Protagoras probably meant that the

phenomenal qualities of a thing depend on the individual perceiver. This interpretation can be specified in three ways:

1. *That the very existence of a phenomenal object depends on the mind of the observer; for example, the water you see only exists in your mind.*
2. *That the object perceived exists independently of the perceiver, but the phenomenal qualities it has only exist in the mind of the perceiver (i.e., the water itself is neither hot nor cold, but if you perceive it as hot, then the heat exists only in your mind).*
3. *That the water itself is both hot and cold and that perceived objects have contradictory properties.*

Protagoras thought that for every argument in favor of a proposition, there is another argument for the opposite statement. He taught his students how to make the apparently weaker argument stronger. Plato objected to this on the grounds that such a procedure teaches people to win a victory in a debate, but not how to discover truth. However, Protagoras also was a teacher of *areté*, or virtue. He trained his students to exercise good judgment in the management of their own lives and of the city. He taught them to act in a way that would have beneficial effects. Therefore, Protagoras' view was probably that, in debate, a wise person would use his or her oratory skills to promote the view that will have overall the most beneficial effects.

Protagoras' Fragments

In the first selected fragment, Diogenes Laertius, writing in the third century A.D., gives a broad overview of Protagoras' views. In several places, it paints Protagoras as a relativist. The second fragment highlights that the Sophists were perhaps the first philosophers to pay attention explicitly to language and argumentation. The third selection gives Aristotle's interpretation of the famous saying that 'man is the measure of all things.'

FRAGMENTS

Protagoras

1.

(DK 80A1) Protagoras was the first to claim that there are two contradictory arguments about everything, and he used them to develop the consequences of contradictory premisses, being the first to use this argumentative technique. He began one of his books as follows: 'Man is the measure of all things—of the things that are, that they are, and of the things that are not, that they are not.' He used to say that the mind was nothing but the senses, as Plato says in *Theaetetus*, and that everything is true. He began another of his books as follows: 'Where the gods are concerned, I am not in a position to ascertain that they exist, or that they do not exist. There are many impediments to

such knowledge, including the obscurity of the matter and the shortness of human life.' . . .

(Diogenes Laertius, *Lives of Eminent Philosophers* 9.51–3 Long)

2.

He was also the first to develop the kind of argument known as 'Socratic'. And, as Plato says in *Euthydemus*, he was the first to make use, in his talks, of the argument of Antisthenes which tries to prove that contradiction is impossible. He was also the inventor of methods of attacking any given position, as Artemidorus the dialectician reports in his *Against Chrysippus*. . . . He was the first to distinguish the fol-

lowing four kinds of speech: wishing, asking, answering, commanding.

(Ibid.)

3.

(DK 80A19) Protagoras said that man is the measure of all things, by which he meant that any impression a person receives is also securely true. From this it follows that the same thing both is and is not the case, and is bad and good and all other contradictories, because it often happens that something can appear beautiful to one lot of people and the opposite to another lot, but on Protagoras' view it is what appears to anyone that is the measure.

(Aristotle, *Metaphysics* 1062^b13–19 Ross)

4.

Protagoras says that the being of things that are consists in their being perceived. He says: 'If you are here with me, it is obvious that I am sitting, but this is not obvious to someone who is not here. Whether or not I am sitting is not clear.' And they say that everything that exists consists in being perceived. I see the moon, for example, while someone else does not see it; whether or not the moon exists is not clear. When I am healthy the apprehension of honey that arises is that it is sweet, but someone else who has a fever apprehends it as bitter; whether it is sweet or bitter is

therefore not clear. In this way they intend to assert the lack of objective apprehension.

(A fragment of Didymus the Blind, *Commentary on the Psalms*; text first published by M. Gronewald in *Zeitschrift für Papyrologie und Epigraphik*, 2 (1968),1–2)

5.

(DK 80A22) [*Protagoras speaking*] I know of plenty of things which are harmful to people (they may be foods or drinks or drugs, or whatever), and others which are beneficial; and I know of things which are neither harmful nor beneficial to people, but which are to horses—or are only to cattle, or only to dogs. And then there are things which are neither harmful nor beneficial for any of these creatures, but are for trees; and things which are good for the roots of trees, but bad for their shoots, such as manure, which is good for all plants when it is applied to their roots, but deadly if put on their shoots and young branches. Or then there's olive oil, which is completely pernicious for all plants and ruins the hair of all non-human creatures, but is good for human hair and for the rest of their body too. Goodness is so diverse and varied that even in our case one and the same thing may be good for the outside of a human body, but awful for the inside.

(Plato, *Protagoras* 334a3–c2 Burnet)

STUDY QUESTIONS: PROTAGORAS

1. What does Protagoras mean when he says, 'Man is the measure of all things'? How does the quotation finish? Is he right?
2. What does Protagoras claim about the mind?
3. What does Protagoras assert about the gods?
4. Name one of the argumentative methods developed by Protagoras.
5. What does Protagoras say about the being of things that are?
6. Protagoras says that goodness is diverse and varied. How does he support this claim?



PHILOSOPHICAL BRIDGES



The Early Ancient Influence

The works of the pre-Socratics contain the seeds of much later thinking. Their thought was extraordinarily diverse and rich both in style and content. The fragments that remain from this period reveal many different styles of philosophical thinking and writing: scientific poems, paradoxical aphorisms, and wise sayings, as well as prose. They contain bright

flashes of insight, detailed observations of nature, and lofty speculations, as well as sustained arguments. In early ancient thought, we can find many of the perennial debates of philosophy: the senses versus reason, reality is timeless versus reality is ever changing, mathematics versus poetry, science versus religion, matter versus form, argument versus rhetoric, and the Absolute versus the relative. Let us examine the influence of each of these thinkers in turn:

1. The pre-Socratics were the first to formulate concepts that are key to philosophy and other disciplines. For instance, the Milesians, Thales and Anaximander, introduced the fundamental concept of the substance-kind or -stuff out of which everything is composed, as well as the claim that all natural phenomena should be explained in terms of alterations to that substance. They were the first to take a systematic and unified approach to the explanation of natural phenomena. Much of later ancient philosophy, such as the influential atomism of Democritus and Epicurus, continued in this same tradition, as did the great poem *On the Nature of Things* by Lucretius (99–55 B.C.). The revolution of the sixteenth century that gave birth to modern science was inspired directly by the rediscovery of such ancient thinkers, who had considerable influence. In this way, the Milesians were the forerunners of sixteenth- and seventeenth-century natural philosophy and, hence, of contemporary science.

2. Likewise, the rediscovery of Pythagorean ideas during the sixteenth century reignited the claim that the universe is inherently mathematical and harmonious and, consequently, was vital to the birth of modern science. These ideas were seen as an illuminating and refreshing antidote to the scholasticism of the middle and later medieval periods. For example, Copernicus (1473–1543) drew inspiration from this Pythagorean and neo-Platonic tradition in formulating his bold hypothesis that the earth orbits the sun. Johannes Kepler's great astronomical work had the Pythagorean title *The Harmony of the World* (1619). Having explained the orbits of the planets in terms of three simple laws, Kepler compared the speed of each orbit to a musical note and likened their combined effect to the music of the spheres in true Pythagorean tradition. Later, Galileo (1564–1642) claimed that the universe is written in the language of mathematics. This general idea has support today among realists, who claim that the universe is inherently mathematical.

At the same time, Pythagoras was the first western thinker to articulate clearly the idea of a soul distinct from the body, which found full expression in the works of Plato, and which was an important aspect of the later marriage of neo-Platonism and Christianity through the works of Plotinus (205–270) and Augustine (354–430) (see the section 'Philosophical Bridges: The Platonic Influence').

3. Heraclitus originated the ideas that there is a divine intelligence governing the universe and that a spark of this intelligence exists in human reason. His idea of fire as the divine aspect of the cosmos and man, and his claim that eternal laws govern the universe, had a decisive influence on Zeno of Citium, the founder of Stoicism. Stoic philosophy became very popular in ancient Rome, and the Roman Empire was receptive to Christianity in large part because of the Heraclitean aspects of Stoicism.

Heraclitus' thesis that all is flux has been an inspiration to a long tradition of philosophers, such as the twentieth-century process thinker Alfred Whitehead, who have rejected the standard static ontology of objects and properties for failing to recognize the importance of time, and who have sought to replace it with a dynamic ontology based on processes and events. This tradition would also include the great German philosopher

Georg Hegel (1777–1831) and the French Nobel Prize winner Henri-Louis Bergson (1859–1941), as well as Karl Marx and Friedrich Engels, who regarded Heraclitus as a precursor of their dialectical materialism because of his conception of change through the conflict of opposites. Part of western metaphysics can be regarded as a debate between the Parmenidean claim that reality must be changeless, and the Heraclitean thesis that reality must be ever changing. Whereas Parmenides' claim has tended to dominate much of the history of philosophy, Heraclitus' thesis has had more influence in the last 50 years.

Heraclitus' assertion that one cannot step into the same river twice, his idea of constant flux, has inspired recent radical ideas. Following leads from Friedrich Nietzsche (1844–1900) who was inspired by Heraclitus, some contemporary French philosophers, such as Jacques Derrida and Luce Irigaray, have challenged the idea of the self-identity of an object. According to this challenge, the thesis that X is simply identical to itself is problematic because X is defined primarily by what it is not. Difference is more fundamental than identity in a way that makes repetition of the same thing through time impossible.

4. The surviving fragments of Parmenides' poem have had an enormous influence on philosophy. They introduced several fundamental new concepts to western thought, such as the sharp distinction between the realm of appearances and reality and the claim that reality is timeless and unchanging. With his theory of Forms, Plato adopted these Parmenidean claims and made them important themes throughout the history of philosophy. For example, we find echoes of Parmenides' thesis in Immanuel Kant's phenomena/noumena distinction, and in later versions of idealism. Furthermore, the sharp distinction between appearances and reality implies that sense perception is systematically misleading because it cannot provide knowledge of reality but only of appearances. Plato made Parmenides' arguments for this claim even more powerful and, thereby, transformed philosophy.

Second, if knowledge of reality cannot be gained through the senses, then it must be acquired by reasoning, even when that reasoning runs against common sense. Once again, Plato took up this theme from Parmenides in his own epistemology, and through him it entered into later philosophy, such as the seventeenth- and eighteenth-century philosophies of Baruch Spinoza and Gottfried Leibniz, who both argued that the true nature of reality can be grasped only by reason. To argue for his startling thesis, Parmenides introduced a new and more precise method to western thought, namely, that of basing deductive arguments on the analysis of key terms, such as 'exist.' Given this, it is no wonder that his and Zeno's arguments caused a revolution in ancient philosophy.

5. Zeno's arguments may have persuaded the Greek atomists that there must exist indivisible atoms. They convinced some later philosophers such as William James and Alfred Whitehead that it is a mistake to conceive time as composed of dimensionless instants. It was not until the nineteenth century that the mathematics was developed to begin to answer Zeno. Even after that, there remain many puzzles surrounding the paradoxes.

6. The atomism of Democritus influenced later ancient thinkers such as Zeno the Stoic and the Epicureans. Democritus' views had a profound effect on early modern science, mainly through the later writings of Lucretius. During the sixteenth-century Renaissance, this atomism was an important source of inspiration to the early scientific thinkers of the time. Sir Francis Bacon, the great spokesman of early modern science, praised Democritus' materialism and, like Galileo, argued that natural phenomena, such as heat, should be explained in terms of the movement of corpuscles.

7. Protagoras' famous assertion that man is the measure of all things was taken to express an idea that was important in the development of humanism during the Renaissance of the fifteenth century. The saying indicates a shift of emphasis away from the standards of the Divine and of the otherworldly realm of Platonic Forms toward the human. We must understand things in human terms, and humanity should be devoted to the study of itself.

However, the philosophy of Nietzsche represents the pinnacle of the sophist influence. Like the Sophists, Nietzsche rejected the idea that we can represent objectively truths about the world; what we call truths are useful and metaphorical claims, which necessarily reflect a perspective. Moreover, he also denied the objectivity of moral evaluations, which are relative and merely reflect the wishes of rulers. Like some sophists, such as Thrasymachus, who appears in Book 1 of Plato's *Republic*, Nietzsche claimed that justice consists in the rules of those who have power. He rejected Christian morality as slavish and life-denying. Postmodernists, who were directly influenced by Nietzsche, are sometimes called contemporary Sophists because of their radical rejection of realistic conceptions of truth and representational epistemologies.

Some writers have claimed that early ancient thought is philosophy at its best. Nietzsche asserted that early ancient pagan thought is preferable to what he called the 'slave morality' of Christianity that denigrates this earthly life for the sake of an afterlife. He also condemns the emphasis on reason and virtue in Socrates, Plato, and Aristotle. In short, according to Nietzsche, the most brilliant period in the history of philosophy is the early ancient one. The twentieth-century philosopher Martin Heidegger (1889–1976) also claimed that philosophy took a wrong turn after and because of Plato. According to Heidegger, philosophy after Plato, with its emphasis on reason, hides rather than discloses Being. In his later life, Heidegger found more illumination in the poetic style of thinking of some of the early pre-Socratics than in the lofty metaphysics of Plato.

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