Part One

Metaphysics and Epistemology: Existence and Knowledge
The Pre-Socratics

You cannot know what is not, nor can you express it. What can be thought of and what can be—they are the same. —Parmenides

It is wise to agree that all things are one. —Heraclitus

You don’t generally find metaphysics and epistemology very far apart. **Metaphysics**, as you now know from reading Chapter 1, is the branch of philosophy concerned with the nature and fundamental properties of being. **Epistemology** is the branch that explores the sources, nature, limits, and criteria of knowledge. These days, when a philosopher makes a metaphysical assertion, he or she will generally consider whether it is the kind of assertion that could possibly be known; that’s why metaphysics and epistemology go together. However, the first philosophers were mainly metaphysicians, so we shall begin by discussing metaphysics. When we look at Plato, whose vast philosophy covered all subjects, we shall take up epistemology.

In its popular usage, the word *metaphysics* has strange and forbidding associations. “Metaphysical bookstores,” for example, specialize in all sorts of occult subjects, from channeling, harmonic convergence, and pyramid power to past-life hypnotic regression, psychic surgery, and spirit photography. However, the true history of metaphysics is quite different. Given the way in which the term was originally coined, you may find its popular association with the occult somewhat amusing. Here is the true story.

Aristotle (384–322 B.C.E.) produced a series of works on a wide variety of subjects from biology to poetry. One set of his writings is known as the *Physics*, from the Greek word *physika*, which means “the things of nature.” Another set, to which Aristotle never gave an official title but to which he referred occasionally as “first philosophy” or “wisdom,” was called simply “the books after the books on nature”
The Nature of Being

When a philosopher asks, What is the nature of being? he or she may have in mind any number of things, including one or more of the following:

- Is being a property of things, or is it some kind of thing itself? Or is there some third alternative?
- Is being basically one, or are there many beings?
- Is being fixed and changeless, or is it constantly changing? What is the relationship between being and becoming?
- Does everything have the same kind of being?
- What are the fundamental categories into which all existing things may be divided?
- What are the fundamental features of reality?
- Is there a fundamental substance out of which all else is composed? If so, does it have any properties? Must it have properties?
- What is the world like in itself, independent of our perception of it?
- What manner of existence do particular things have, as distinct from properties, relations, and classes? What manner of existence do events have? What manner do numbers, minds, matter, space, and time have? What manner do facts have?
- That a particular thing has a certain characteristic—is that a fact about the thing? Or is it a fact about the characteristic?

Several narrower questions may also properly be regarded as questions of metaphysics, such as: Does God exist? Is what happens determined? Is there life after death? Must events occur in space and time?

Some of these questions are none too clear, but they provide signposts for the directions a person might take in coming to answer the question, What is the nature of being? or in studying metaphysics. Because the possibilities are so numerous, we will have to make some choices about what topics to cover in the pages that follow. We cannot go on forever.

(ta meta ta physika biblia) by later writers and particularly by Andronicus of Rhodes, who was the cataloger of Aristotle’s works in the first century B.C.E. The word metaphysics, then, translates loosely as “after the Physics.”

The subjects Aristotle discussed in these works are more abstract and more difficult to understand than those he examined in the Physics. Hence, later authorities determined that their proper place was indeed “after the Physics,” and thus Metaphysics has stuck as the official title of Aristotle’s originally untitled work and, by extension, as the general name for the study of the topics treated there—and related subjects. Aristotle’s works are the source of the term metaphysics, but Aristotle was not the first metaphysician. As we’ll show in this chapter, philosophers before Aristotle had also discussed some of these things.

The fundamental question treated in Aristotle’s Metaphysics, and thus the fundamental metaphysical question, can be put this way: What is the nature of being? A number of different subjects might qualify as “related” to this question, and in contemporary philosophical usage metaphysics is a rather broad and inclusive field. However, for most philosophers it does not include such subjects as astral projection, psychic surgery, or UFOs. Instead, it includes such questions as those in the box “The Nature of Being.”

What is the nature of being? One of the authors used to ask his introductory classes to answer that question in a brief essay. The most common response, along with “Huh?” “What?” “Are you serious?” and “How do you drop this class?” was “What do you mean, ‘What is the nature of being?’” People are troubled by what
the question means and are uncertain what sort of thing is expected for an answer. This is the way, incidentally, with a lot of philosophical questions—it is difficult to know exactly what is being asked or what an answer might look like.

In this chapter, we explore several different approaches that have been taken to this question.

The first philosophers, or first Western philosophers at any rate, lived in Ionia, on the coast of Asia Minor, during the sixth century B.C.E. They are known collectively as the pre-Socratic philosophers, a loose chronological term applied to the Greek philosophers who lived before Socrates (c. 470–399 B.C.E.). Most left little or nothing of their own writings, so scholars have had to reconstruct their views from what contemporaneous and later writers said about them.

Experience indicates that it is sometimes difficult to relate to people who lived so long ago. However, the thinking of these early philosophers has had a profound effect on our world today. During this period in Western history—ancient Greece before Socrates—a decisive change in perspective came about that ultimately made possible a deep understanding of the natural world. It was not inevitable that this change would occur, and there are societies that exist today whose members, for lack of this perspective, do not so much as understand why their seasons change. We are not arguing for the virtues of advanced technological civilization over primitive life in a state of nature, for advanced civilization is in some ways a mixed blessing. But advanced civilization is a fact, and that it is a fact is a direct consequence of two developments in thought. One of these, which we will not discuss, is the discovery by the Greeks of mathematics. The other, which we are about to discuss, is the invention by the Greeks of philosophy, specifically metaphysics.

THE MILESIANS

Tradition accords to Thales [Thay-leez] (c. 625–547 B.C.E.), a citizen of the wealthy Ionian Greek seaport town of Miletus, the honor of being the first Western philosopher. And philosophy began when it occurred to Thales to consider whether there might be some fundamental kind of stuff out of which everything else is made. Today we are so accustomed to thinking of the complex world we experience as made up of a few basic substances (hydrogen, oxygen, carbon, and the other elements) that we are surprised there ever was a time when people did not think this. Thales deserves credit for helping to introduce a new and important idea into Western thought.

Thales also deserves credit for helping introduce a nonmythological way of looking at the world. The Greeks thought their gods were in charge of natural forces; Zeus, for example, the supreme god, was thought to sometimes alter the weather. Our own belief that nature runs itself according to fixed processes that govern underlying substances began to take shape about this time, and Thales' philosophizing contributed to this important change in outlook.

What is the basic substance, according to Thales? His answer was that all is water, and this turns out to be wrong. But it was not an especially silly answer for
Imagine Thales looking about at the complicated world of nature and reasoning: “Well, if there is some underlying, more fundamental level than that of appearances, and some kind of substance exists at that level out of which everything else is made, then this basic substance would have to be something very flexible, something that could appear in many forms.” And of the candidates Thales saw around him, the most flexible would have been water—something that can appear in three very different states. So we can imagine Thales thinking that, if water can appear in these three very different forms that we know about, it may be that water can also appear in many other forms that we do not understand. For example, when a piece of wood burns, it goes up in smoke, which looks like a form of steam. Perhaps, Thales might have speculated, the original piece of wood was actually water in one of its more exotic forms.

But Thales was not dull. Aristotle called him the first philosopher, and he was also a valued political advisor. His prediction of an eclipse of the sun probably impressed even the Thracian maiden. Once, according to the twentieth-century philosopher Bertrand Russell, when an Egyptian king asked Thales to determine the height of a pyramid, Thales simply measured the height of the pyramid’s shadow at the time of day when his own shadow equaled his own height.

When Thales took time away from his higher pursuits, he could be extremely practical. To counter the criticism of his fellow Milesians concerning his poverty, he used his knowledge of the heavens to foresee a bumper crop of olives. Then he hired all the olive presses in Miletus and Chios. When the crop came and the olives were harvested, Thales was able to rent the presses at his own price.

Philosophers, naturally, have said that this was Thales’ way of showing that a philosopher could easily be wealthy—if he had an interest in money.
The nucleus of fire and dark mist formed; the mist solidified in its center, producing the world. The world is surrounded by fire, which we see as the stars and other heavenly bodies, through holes in the mist. The seasons change as powers of heat and cold and wetness and dryness alternate. Anaximander, as you can see, proposed a theory of the universe that explained things in terms of natural powers and processes.

The third great Milesian philosopher was Anaximenes [an-nex-IM-in-eez] (fl. c. 545 B.C.E.), who pronounced the basic substance to be air and said that air becomes different things through processes of condensation and rarefaction. When it is rarefied, air becomes fire; when it is condensed it becomes first wind, then (through additional condensation) clouds, water, earth, and, finally, stone. He said that the earth is flat and floats on air. It isn’t hard to imagine why Anaximenes thought that air is the basic substance; after all, it is that which enables life to exist. Anaximenes attempted to explain natural occurrences with his theory, and his attempt to identify the basic principles of transformation of the underlying substance of the world continues to this day.

PYTHAGORAS

Quite a different alternative was proposed by Pythagoras [puh-THAG-uh-rus] (c. 580–c. 500 B.C.E.) and his followers, who lived in the Greek city of Crotona in southern Italy. The Pythagoreans kept their written doctrines pretty secret, and controversy remains over the exact content of these doctrines. Pythagoras is said to have maintained that things are numbers, and we can try to understand what this might mean. Two points make a line, three points define a surface, solids are made of surfaces, and bodies are made out of solids. Aristotle, a primary source of information about the early philosophers, reported in his Metaphysics that the Pythagoreans “construct natural bodies, things that have weight or lightness, out of numbers, things that don’t have weight or lightness.” However, Theano, the wife of Pythagoras, had this to say:

Many of the Greeks believe Pythagoras said all things are generated from number. The very assertion poses a difficulty: How can things which do not exist even be conceived to generate? But he did not say that all things come to be from number; rather, in accordance with number—on the grounds that order in the primary sense is in number and it is by participation in order that a first and a second and the rest sequentially are assigned to things which are counted.

In other words, things are things—one thing ends and another thing begins—because they can be enumerated. If one thing can be distinguished from another thing, it is because things were countable. Also, in Theano’s account, it would not matter whether a thing were a physical object or an idea. If we can delineate it from another of its type—if it can be enumerated—it is a thing; and if it is a thing, it can be enumerated.
So, according to Theano, Pythagoras meant there is an intimacy between things and numbers. Whatever the thing, whether it is physical or not, it participates in the universe of order and harmony: it can be sequenced, it can be counted, it can be ordered. And in the Pythagorean philosophy, the idea of orderliness and harmony applies to all things.

The Pythagorean combination of mathematics and philosophy helped promote an important concept in metaphysics, one we will encounter frequently. This is the idea that the fundamental reality is eternal, unchanging, and accessible only to reason. Sometimes this notion about fundamental reality is said to have come from Plato, but it is fair to say it originated with the Pythagoreans.

Another important pre-Socratic philosopher was Heraclitus [hayr-uh-KLITE-us] (c. 540–c. 480 B.C.E.), a Greek nobleman from Ephesus, who proposed yet another candidate as the basic element. According to Heraclitus, all is fire. In fixing fire as the basic element, Heraclitus was not just listing an alternative to Thales’...
Parmenides favored logic over sense experience as the proper method for investigating things.

water and Anaximenes’ air. Heraclitus wished to call attention to what he thought was the essential feature of reality; namely, that it is ceaselessly changing. There is no reality, he maintained, save the reality of change: permanence is an illusion. Thus, fire, whose nature it is to ceaselessly change, is the root substance of the universe.

Heraclitus did not believe that the process of change is random or haphazard. Instead, he saw all change as determined by a cosmic order that he called the *logos*, which is Greek for “word.” He taught that each thing contains its opposite, just as, for example, we are simultaneously young and old and coming into and going out of existence. Through the *logos* there is a harmonious union of opposites, he thought.

Heraclitus is famous for the remark attributed to him, “You cannot step in the same river twice.” The remark raises the important philosophical problem of identity or “sameness over change”: Can today’s river and yesterday’s river be the same, since not a single drop of water in yesterday’s river is in today’s river? The question, obviously, applies not just to rivers, but to anything that changes over time: rivers, trees, chickens, and the World Wide Web. It also, significantly, applies to people, and this is the problem of personal identity: you are not quite the same person today that you were yesterday, and over a lifetime it begins to seem that we should just drop the qualifying word *quite*. The atoms in George Bush Senior are not the same atoms as in George Bush Junior, and so we have two different people there—but the atoms in George Bush Senior in 2005 likewise are not the same atoms as in George Bush Senior in 1959. So why do we count this as one person and not as two?

Change does seem to be an important feature of reality—or does it? A younger contemporary of Heraclitus, Parmenides [par-MEN-uh-deez], thought otherwise. Parmenides’ exact dates are unknown, but he lived during the first quarter of the fifth century B.C.E.

Parmenides was not interested in discovering the fundamental substance that constitutes everything or in determining what the most important feature of reality is. His whole method of inquiry was quite unlike that of his predecessors. In all probability the Milesians, Heraclitus, and the Pythagoreans reached their conclusions by looking around at the world and considering possible candidates for its primary substance or fundamental constituents. Parmenides, by contrast, simply
assumed some very basic principles and attempted to deduce from these what he thought must be the true nature of being. For Parmenides it would have been a complete waste of time to look to the world for information about how things really are.

Principles like those Parmenides assumed are said in contemporary jargon to be a priori principles, or principles of reason, which just means that they are known prior to experience. It is not that we learn these principles first chronologically but rather that our knowledge of them does not depend on our senses. (See the box “A Priori and A Posteriori Principles” for more details.)

For example, consider the principle “You can’t make something out of nothing.” If you wished to defend this principle, would you proceed by conducting an experiment in which you tried to make something out of nothing? In fact, you would not. You would base your defense on our inability to conceive of ever making something out of nothing.

Parmenides based his philosophy on principles like that. One of these principles was that, if something changes, it becomes something different. Thus, he reasoned, if being itself were to change, then it would become something different. But what is different from being is nonbeing, and nonbeing just plain isn’t. Thus, he concluded, being does not change.

What is more, being is unitary—it is a single thing. If there were anything else, it would not be being; hence, it would not be. (The principle assumed in this argument is similar to “a second thing is different from a first thing.”)

Further, being is an undifferentiated whole: it does not have any parts. Parts are different from the whole, and if something is different from being, it would not be being. Hence, it would not be.

Further, being is eternal: it cannot come into existence because, first, something cannot come from nothing (remember?) and, second, even if it could, there would be no explanation why it came from nothing at one time and not at another. And because change is impossible, as already demonstrated, being cannot go out of existence.
On Rabbits and Motion

Parmenides’ most famous disciple, Zeno [ZEE-no] (c. 495–c. 430 B.C.E.), devised a series of ingenious arguments to support Parmenides’ theory that reality is One. Zeno’s basic approach was to demonstrate that motion is impossible. Here are two of his anti-motion arguments:

1. For something, let’s say a rabbit, to move from its own hole to another hole, it must first reach the midway point between the two holes. But to reach that point, it must first reach the quarter point. Unfortunately, to reach the quarter point, it must reach the point that is one-eighth the distance. But first, it must reach the point one-sixteenth the distance. And so on and so on. In short, a rabbit, or any other thing, must pass through an infinite number of points to go anywhere. Because some sliver of time is required to reach each of these points, a thing would require an infinite amount of time to move anywhere, and that effectively rules out the possibility of motion.

2. For a rabbit to move from one hole to a second hole, it must at each moment of its travel occupy a space equal to its length. But when a thing occupies a space equal to its length, it is at rest. Thus, because the rabbit—or any other thing—must occupy a space equal to its length at each moment, it must be at rest at each moment. Thus, it cannot move.

Well, yes, it seems obvious that things move. Which means either that there is a mistake in Zeno’s logic or that rabbits, and just about every other thing, are not really the way they seem to be. Zeno favored the second alternative. You, probably, will favor the first alternative. So what is the mistake in Zeno’s logic?

By similar arguments Parmenides attempted to show that motion, generation, and degrees of being are all equally impossible. For examples of arguments demonstrating the impossibility of motion, see the box “On Rabbits and Motion.”

Heraclitus envisioned being as ceaselessly changing, whereas Parmenides argued that being is absolutely unchanging. Being is One, Parmenides maintained: it is permanent, unchanging, indivisible, and undifferentiated. Appearances to the contrary are just gross illusion.

EMPEDOCLES AND ANAXAGORAS

The philosophies of Parmenides (being is unchanging) and Heraclitus (being is ceaselessly changing) seem to be irreconcilably opposed. The next major Greek philosopher, Empedocles [em-PED-uh-kleez] (c. 490–430 B.C.E.), thought that
true reality is permanent and unchangeable, yet he also thought it absurd to dismiss the change we experience as mere illusion. Empedocles quite diplomatically sided in part with Parmenides and in part with Heraclitus. He was possibly the first philosopher to attempt to reconcile and combine the apparently conflicting metaphysics of those who came earlier. Additionally, Empedocles’ attempt at reconciliation resulted in an understanding of reality that in many ways is very much like our own.

According to Empedocles, the objects of experience do change, but these objects are composed of basic particles of matter that do not change. These basic material particles themselves, Empedocles held, are of four kinds: earth, air, fire, and water. These basic elements mingle in different combinations to form the objects of experience as well as the apparent changes among these objects.

The idea that the objects of experience, and the apparent changes in their qualities, quantities, and relationships, are in reality changes in the positions of basic particles is very familiar to us and is a central idea of modern physics. Empedocles was one of the first to have this idea.

Empedocles also recognized that an account of reality must explain not merely how changes in the objects of experience occur but why they occur. That is, he attempted to provide an explanation of the forces that cause change. Specifically, he taught that the basic elements enter new combinations under two forces—love and strife—which are essentially forces of attraction and decomposition.

This portrayal of the universe as constituted by basic material particles moving under the action of impersonal forces seems very up to date and “scientific” to us today, and, yes, Empedocles was a competent scientist. He understood the mechanism of solar eclipses, for example, and determined experimentally that air and water are separate substances. He understood so much, in fact, that he proclaimed himself a god. Empedocles was not displeased when others said that he could foresee the future, control the winds, and perform other miracles.

A contemporary of Empedocles was Anaxagoras [an-ak-SAG-uh-rus] (c. 500–c. 428 B.C.E.). Anaxagoras was not as convinced of his own importance as Empedocles was of his, but Anaxagoras was just as important historically. For one thing, it was Anaxagoras who introduced philosophy to Athens, where the discipline truly flourished. For another, he introduced into metaphysics an important distinction, that between matter and mind.

Anaxagoras accepted the principle that all changes in the objects of experience are in reality changes in the arrangements of underlying particles. But unlike Empedocles, he believed that everything is infinitely divisible. He also held that each different kind of substance has its own corresponding kind of particle and that each substance contains particles of every other kind. What distinguishes one substance from another is a preponderance of one kind of particle. Thus, fire, for example, contains more “fire particles” than, say, water, which presumably contains very few.

Whereas Empedocles believed that motion is caused by the action of two forces, Anaxagoras postulated that the source of all motion is something called nous. The Greek word nous is sometimes translated as “reason,” sometimes as “mind,” and what Anaxagoras meant by nous is apparently pretty much an
The Olympics

Ancient Greece gave birth to more than philosophy. It also gave birth to the Olympics. This was around 776 B.C.E. in Olympia, near Athens. Thousands of spectators stopped doing whatever they were doing, including occasionally warring, and watched people compete in running, boxing, wrestling, the pentathlon, and other events (not including philosophizing). Actually, the competitors were all males: women couldn’t participate, and married women couldn’t even watch. This, at the time, was a pretty strict rule, and the penalty for violating it was . . . death.

The Olympics returned to Athens in 2004 and are in Beijing in 2008.

Mind, according to Anaxagoras, is separate and distinct from matter in that it alone is unmixed. It is everywhere and animates all things but contains nothing material within it. It is “the finest of all things, and the purest, and it has all knowledge about everything, as well as the greatest power.”

Before mind acted on matter, Anaxagoras believed, the universe was an infinite, undifferentiated mass. The formation of the world as we know it was the result of a rotary motion produced in this mass by mind. In this process gradually the sun and stars and moon and air were separated off, and then gradually, too, the configurations of particles that we recognize in the other objects of experience.

According to Anaxagoras, mind did not create matter but only acted on it. Notice also that Anaxagoras’s mind did not act on matter for some purpose or objective. These are strong differences between Anaxagoras’s mind and the Judaeo-Christian God, although in other respects the concepts are not dissimilar. And, although Anaxagoras was the first to find a place for mind in the universe, Aristotle and Plato both criticized him for conceiving of mind as merely a mechanical cause of the existing order.

Finally, Anaxagoras’s particles are not physical particles like modern-day atoms. If every particle is made of smaller particles, as Anaxagoras held, then there are no smallest particles, except as abstractions, as infinitesimals, as idealized “limits” on an infinite process. For the idea that the world is composed of actual physical atoms, we must turn to the last of the pre-Socratic philosophers, the Atomists.
The Atomists held that all things are composed of physical atoms—tiny, imperceptible, indestructible, indivisible, eternal, and uncreated particles composed of exactly the same matter but different in size, shape, and (though there is controversy about this) weight. Atoms, they believed, are infinitely numerous and eternally in motion. By combining with one another in various ways, atoms compose the objects of experience. They are continuously in motion, and thus the
PROFILE: Democritus (c. 460–c. 370 B.C.E.)

Democritus was the most widely traveled of the early philosophers. On the death of his father, he took his inheritance and left his home in Abdera, Thrace, to learn from the Chaldean Magi of Persia, the priest-geometers of Egypt, and the Gymnosophists of India. He may also have gone to Ethiopia. But he came to Athens as an unknown, for Democritus despised fame and glory.

Democritus thought that most humans waste their lives pursuing foolish desires and pleasures. He himself was far more interested in pursuing wisdom and truth than riches, and he spent his life in relative poverty. He found the cemetery a congenial place in which to cogitate.

various combinations come and go. We, of course, experience their combining and disassembling and recombining as the generation, decay, erosion, or burning of everyday objects.

Some qualities of everyday objects, such as their color and taste, are not really “in” the objects, said the Atomists, although other qualities, such as their weight and hardness, are. This is a distinction that to this day remains embodied in common sense; yet, as we will discuss in Chapter 6, it is totally beset with philosophical difficulties.

Anyway, the Atomists, unlike Anaxagoras, believed that there is a smallest physical unit beyond which further division is impossible. And also unlike Anaxagoras, they saw no reason to suppose that the original motion of atoms resulted from the activity of mind; indeed, they did not believe it necessary in the first place to explain the origin of that motion. As far as we can tell, they said in effect that atoms have been around forever, and they have been moving for as long as they have been around. This Atomist depiction of the world is quite modern. It is not such an extravagant exaggeration to say that, until the convertibility of matter and energy was understood in the twentieth century, the common scientific view of the universe was basically a version of atomism. But the Atomist theory did run up against one problem that is worth looking at briefly.

The Greek philosophers generally believed that for motion of any sort to occur, there must be a void, or empty space, in which a moving thing may change position. But Parmenides had argued pretty convincingly that a void is not possible. Empty space would be nothingness—that is, nonbeing—and therefore does not exist.

The Atomists’ way of circumventing this problem was essentially to ignore it (although this point, too, is controversial). That things move is apparent to sense perception and is just indisputable, they maintained, and because things move, empty space must be real—otherwise, motion would be impossible.

One final point about the Atomist philosophy must be mentioned. The Atomists are sometimes accused of maintaining that chance collisions of atoms cause them to come together to form this or that set of objects and not some other. But even though the Atomists believed that the motion of the atoms fulfills no purpose,
Free Will versus Determinism

Here are two beliefs that are both dear to common sense. We hold the first belief thanks (in part) to the Atomists.

1. The behavior of atoms is governed entirely by physical law.
2. Humans have free will.

Do you accept both (1) and (2)? We are willing to wager that you do.

Unfortunately, (1) and (2) do not get along comfortably with each other. Here is why. It seems to follow from (1) that whatever an atom does, it has to do, given the existing circumstances, because physical laws determine what each atom does in the existing circumstances. Thus, if the laws determine that an atom does X in circumstance C, then, given circumstance C, the atom has to do X.

But anything that happened as a result of free will presumably did not have to happen. For example, suppose that I, of my own free will, move my arm. Whatever the circumstances were in which I chose to move my arm, I could always have chosen otherwise and not moved my arm. Therefore, when I moved my arm of my own free will, my arm, and thus the atoms in my arm, did not have to move, even given the existing circumstances. Thus, if (2) holds, it is *not true* that an atom must have done what it did, given the existing circumstances. But if (1) holds, then it *is true*.

As the famous twentieth-century physicist Arthur Eddington said, “What significance is there in my struggle tonight whether I shall give up smoking, if the laws that govern matter already preordain for tomorrow a configuration of matter consisting of pipe, tobacco, and smoke connected with my lips?”

they also believed that atoms operate in strict accordance with physical laws. Future motions would be completely predictable, they said, for anyone with sufficient information about the shapes, sizes, locations, direction, and velocities of the atoms. In this sense, then, the Atomists left nothing to chance; according to them, purely random events, in the sense of just “happening,” do not occur.

The view that future states and events are completely determined by preceding states and events is called determinism. When you read the box “Free Will versus Determinism,” you will see that determinism seems to contradict the belief in free will.

To sum up this chapter, despite the alternative theories the pre-Socratics advanced, an important common thread runs through their speculation, and it is this:

All believed that the world we experience is merely a manifestation of a more fundamental, underlying reality.

That this thought occurred to people represents a turning point in the history of the species and may have been more important than the invention of the wheel.
Had it not occurred, any scientific understanding of the natural world would have proved to be quite impossible.

The desire to comprehend the reality that underlies appearances did not, however, lead the various pre-Socratic philosophers in the same direction. It led the Milesians to consider possible basic substances and the Pythagoreans to try to determine the fundamental principle on which all else depends. It led Heraclitus to try to determine the essential feature of reality, Parmenides to consider the true nature of being, and Empedocles to try to understand the basic principles of causation. Finally, it led Anaxagoras to consider the original source of motion and the Atomists to consider the construction of the natural world. Broadly speaking, these various paths of inquiry eventually came to define the scope of scientific inquiry. But that was not until science and metaphysics parted ways about two thousand years later.

**CHECKLIST**

To help you review, here is a checklist of the key philosophers and terms and concepts of this chapter. The brief descriptive sentences summarize the philosophers’ leading ideas. Keep in mind that some of these summary statements are oversimplifications of complex positions.

**Philosophers**

- **Anaxagoras** maintained that all things are composed of infinitely divisible particles; the universe was caused by mind (nous) acting on matter. 29
- **Anaximander** held that the original source of all things is a boundless, indeterminate element. 23
- **Anaximenes** said that the underlying principle of all things is air. 24
- **The Atomists** (especially Leucippus and Democritus) said that all things are composed of imperceptible, indestructible, indivisible, eternal, and uncreated atoms. Motion needs no explanation. 31
- **Empedocles** held that apparent changes in things are in fact changes in the positions of basic particles, of which there are four types: earth, air, fire, and water. Two forces cause these basic changes: love and strife. 28
- **Heraclitus** held that the only reality is ceaseless change and that the underlying substance of the universe is fire. 25
- **Parmenides** said that the only reality is permanent, unchanging, indivisible, and undifferentiated being and that change and motion are illusions of the senses. 26
- **Pythagoras** maintained that enumerability constitutes the true nature of things. 24
- **Thales** held that water is the basic stuff of which all else is composed. 22
- **Zeno** devised clever paradoxes seeming to show that motion is impossible. 28

**Key Terms and Concepts**

- a priori principle/a posteriori principle 27
- Atomism 31
- determinism 33
- epistemology 20
- free will versus determinism 33
- logos 26
- metaphysics 20
- myths 31
- nous 29
- pre-Socratic philosophers 22
- problem of identity 26
- problem of personal identity 26

**QUESTIONS FOR DISCUSSION AND REVIEW**

1. Explain the derivation of the word *metaphysics*.
2. Provide some possible interpretations of the question, *What is the nature of being?*
3. Compare and contrast the metaphysics of the three Milesians. Whose metaphysics seems most plausible to you, and why?
4. The Pythagoreans theorized that all things come to be in accordance with number. What does this theory mean?

5. Compare and contrast the metaphysics of Heraclitus and Parmenides.

6. Explain and critically evaluate Parmenides’ arguments that being is unitary, undifferentiated, and eternal.

7. Compare and contrast the metaphysics of Empedocles, Anaxagoras, and the Atomists. Whose views are the most plausible, and why?

8. “The behavior of atoms is governed entirely by physical law.” “Humans have free will.” Are these statements incompatible? Explain.

9. Is it true that something cannot come from nothing? How do you know?

10. Defend this claim: The way things seem cannot be the way they are.

**SUGGESTED FURTHER READINGS**


John Burnet, *Early Greek Philosophy*, 4th ed. (London: Macmillan, originally published in 1930). This is generally considered the standard work on the subject.


