

A BUDGET TOUR OF ANCIENT GREEK PHILOSOPHY BEFORE SOCRATES

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The western philosophical and scientific tradition begins with a series of thinkers who we call the “pre-Socratics” (because they lived and worked before Socrates). Like some of the poets and mythmakers who came before them, the pre-Socratics were interested in explaining the world in general terms, giving an account of its origins, and explaining natural phenomena. However, in place of the anthropomorphic gods, who are central to the poets accounts, the pre-Socratics offered explanations in terms of natural objects and their properties. Increasingly they abandoned appeals to tradition, relying instead on argument.

No complete works by any of these thinkers have survived. The information we have about them comes from fragments of their works, which survived as quotations in treatises by later authors, and from descriptions of their ideas provided by later authors.

This “Tour” gives a brief overview of the ideas of some of these pre-Socratic thinkers, with an emphasis on those issues that are relevant to the study of Plato and Aristotle. The purpose is to provide some background to the *Ancient Greek Philosophy* course. Many of these thinkers are extremely difficult to interpret, especially since we often have to rely on second- or third-hand accounts of their ideas. For the purposes of this “tour”, I have ignored or simplified many issues that we would have to stop over if we undertook to study these thinkers in their own right.

A. THE MILESIANS AND THE STUDY OF NATURE

The earliest pre-Socratics are called Milesians, after Miletus, a city in Asia Minor, where they lived. These thinkers sought to explain the world in terms of some basic material, out of which everything else was made.

1. THALES (C.585 B.C.)

Thales is the first of the Milesians and the first philosopher and scientist in the Western tradition. He is credited with such accomplishments as predicting a solar eclipse, using geometrical techniques to determine the distance of ships from shore, and diverting rivers to allow armies to cross. Thales' most notable contribution to the history of philosophy and science, however, is his idea that the many different things in the world are all ultimately composed of (and so understandable in terms of) one basic substance: water. No writings by Thales survive, so all our knowledge about him comes from testimony by later philosophers, mostly Aristotle.

- (1) Most of the first philosophers, then, thought that the only principles¹ of all things were material. For they say there is something that all beings come from: the first thing they come to be from and the last thing they perish into (the substance remaining throughout but changing in respect of its attributes). This they say is the element and the principle of beings. (Aristotle, *Metaphysics* I.3 983b8-12, tr. Irwin and Fine w/ emendations)
- (2) Thales, the originator of this sort of philosophy, says it is water (that is why he also declared that the earth rests on water). Presumably, he reached this view by seeing that what nourishes all things is wet and that the hot itself comes from the wet and is kept alive by it (and what all things come from is their origin). He also reached this view because he thought that the seeds of all things have a wet nature (and water is the origin of the nature of all wet things). (Ibid. 983b20-27)
- (3) From what has been related about him, it seems that Thales, too, supposed that the soul was something that produces motion, if indeed he said that the magnet has soul, because it moves iron. (Aristotle, *De Anima* I.2 405a19 tr. Curd)
- (4) Thales thought that all things are full of gods. (Ibid. I.5 411a8)

2. ANAXIMANDER (C. 546 B.C.)

Anaximander, who may have been a student of Thales', offered a detailed account of the cosmos including an account of the development of animals. He is also reputed to have made the first map of the world. For our purposes, it is enough to know that he disagreed with Thales that water is the principle of all things. Instead, he thought that the principle was something else which he called "the indefinite,"

¹ The Greek word translated "principle" is "*archē*," which means beginning, starting-point, origin, etc.

presumably because it lacked all of the specific qualities that distinguish particular substances like water, air and earth from one another.

Anaximander held that something “separated off” from the indefinite and divided into “the hot” and “the cold”. The opposition between the hot and the cold (and perhaps other pairs of opposites as well) plays an important role in Anaximander’s thinking. The idea seems to be that when there is too much of one opposite—for example, the hot—this state of affairs is “unjust” to its opposite—the cold. In time the cold gets its revenge by overpowering the hot, which then gets back by overpowering the cold again. Anaximander probably used this sort of reasoning to explain the cycle of the seasons, the alternation of day and night, and other natural processes. This is worth keeping in mind as the idea of opposites will be important as we proceed.

The only original writing by Anaximander to survive is a brief quotation in another work, so (as with Thales) most of our knowledge about him comes from testimony by later thinkers.

- (1) He says [the principle] is neither water nor any other of the so-called elements, but a substance different from them, which is indefinite, from which all the heavens and the worlds within them arise. And things pass away again into [the substance] from which they arose, “as is ordained; for they make reparation and satisfaction to one another for their injustice according to the appointed time,” as he says in these somewhat poetical terms (Simplicius, *Commentary on Aristotle’s Physics* 24.13-21. tr. based on Burnet)
- (2) He declares that what arose from the eternal and is productive of hot and cold was separated off at the coming to be of the world. (pseudo-Plutarch, *Miscellanies* 179.2 tr. McKirahan w/ emendations)

3. ANAXIMENES (C. 546 B.C.)

Anaximenes contended that the stuff of which everything is made is air, which he thought transforms into other substances by getting rarer or denser. He associated heat with rarity and coldness with density, supporting this view with a simple experiment.

- (1) Anaximenes ... identifies [the one underlying nature] with air; and [says that] it differs in its substance by rarity and density. When it becomes finer it becomes fire; when it becomes thicker, it becomes cloud; then (when thickened still more) water, then earth, then stones; and the rest come into being from these. (Theophrastus quoted by Simplicius *Commentary Aristotle’s Physics* 24.26-25.1 tr. Kirk, Raven and Schofield w/ emendations)
- (2) He declares that matter that is contracted and condensed is cold and [matter] that is fine and “loose” ... is hot. As a result, he claimed that it is not said unreasonably that a person releases both hot and cold from his mouth. For the breath becomes cold when compressed and condensed by the lips, and when the mouth is relaxed, the escaping breath becomes warm through the rareness. (Plutarch, *The Principle of Cold* 7 947F tr. McKirahan w/ emendations)

B. THE SOPHISTS

The term “sophist” means wise man, but it was applied specifically to a class of traveling teachers in the 5th Century including such men as Antiphon (c. 480-411 B.C.), Thrasymachus (c. 415 B.C.), Protagoras (c.490-420 B.C.), and Gorgias (c. 483-376 B.C.). The sophists taught a wide variety of subjects, but are most associated with teaching their students how to argue and make speeches. They were controversial figures for several reasons. First, they charged a fee for their teaching, which was an unusual practice at the time. Second, some of their teachings called into question traditional ideas about the gods and morality. Third, and perhaps most importantly, the rhetorical techniques they taught were thought to be dangerous because they could be used to sway juries and assemblies, regardless of the merits of the case. Indeed, Protagoras boasted that he could “make the weaker argument the stronger” (DK 80b6). For these reasons, the sophists acquired the sort of bad reputation that lawyers and professors have in some circles today.

Some of the sophists made significant contributions to the history of thought. In particular, some were moral relativists, who argued that justice was merely a convention that differed from city to city. Some, including Protagoras, even went so far as to claim that all truth was relative, and Gorgias argued at length that nothing exists. These ideas were of especially great interest to Plato, who was deeply opposed to them.

- (1) Antiphon: Justice is a matter of not transgressing what the laws prescribe in whatever city you are a citizen of. A person would make the most advantage of justice for himself if he treated the laws as important in the presence of witnesses, and treated only the decrees of nature as important when they are alone with no witnesses present. (Antiphon DK87A44, tr. McKirahan w/ emendations)
- (2) Thrasymachus (as portrayed by Plato): I say justice is nothing other than the advantage of the stronger... Some cities are ruled by a tyranny, some by a democracy, and some by an aristocracy... And in each city, this element is stronger, namely the ruler... And each makes laws to its own advantage... And they declare what they have made—what is to their own advantage—to be just for their subjects, and they punish anyone who goes against this as lawless and unjust. This, then, is what I say justice is, the same in all cities, the advantage of the established rule. Since the established rule is surely stronger, anyone who reasons correctly will conclude that the just is the same everywhere, namely, the advantage of the stronger. (*Republic* 338c-339a, tr. Grube)
- (3) Protagoras: There are two opposing arguments concerning everything. (DK 80B6, tr. Curd)
- (4) Protagoras: Man is the measure of all things—of things that are, that they are, and of things that are not that they are not. (DK 80B1, tr. McKirahan w/ emendations)
- (5) [According to Protagoras] “Man is the measure of all things” [...] of white and heavy and light and all of that kind of thing without exception. He has the criterion of these things within himself; so when he thinks that these things are as he experiences them, he thinks what is true and what really is for him. (Plato, *Thaetetus*, 178b tr. Levett, rev. Burnyeat)
- (6) [According to Protagoras] each of us is the measure of the things which are and the things which are not. (Ibid 166d)

- (7) [According to Protagoras] only the individual himself can judge his own world, and what he judges is always true and correct. (Ibid 161e)
- (8) [Protagoras] puts it something like this, that as each thing appears to me, so it is for me, and as it appears to you, so it is for you—you and I each being a man. (Ibid 152a)
- (9) Doesn't it sometimes happen that when the same wind is blowing, one of us feels cold and the other not? Or that one of us feels pretty cold and the other very cold? Well then, in that case are we going to say that the wind itself, by itself, is cold or not cold? Or shall we listen to Protagoras, and say it is cold for the one of us who feels cold, and for the other not cold? (Ibid 152b)
- (10) [Protagoras' theory says] that there is nothing which is in itself just one thing: nothing which you could rightly call anything or any kind of thing. If you call a thing large, it will reveal itself as small, and if you call it heavy, it is liable to appear as light, and so on with everything, because nothing is one or anything or any kind of thing. What is really true, is this: the things of which we naturally say they "are", are in the process of coming to be, as the result of movement and change and blending with one another. We are wrong when we say they "are", since nothing ever is, but everything is coming to be (Ibid 152d-e).

C. PYTHAGORAS AND THE PYTHAGOREANS

Pythagoras (c. 550-c. 500 B.C.) is something of a mysterious character. He assembled a group of followers in Croton (a Greek city in Italy), which may have begun as a political association, but soon evolved into something more like a religious cult, complete with dietary restrictions and legends about its founder. Followers referred to Pythagoras as a god or “divine man”, and memorized collections of his sayings. Both because these sayings were passed down orally, and because the early Pythagoreans were secretive, it is difficult to determine exactly what they thought and which of their doctrines are due to Pythagoras himself. Most important for our purposes is their belief in reincarnation and their interest in mathematics. They seem to have held that numbers (rather than materials like water or air) are the basic constituents or origins of the things in the world.

- (1) What he said to his associates, nobody can say for certain; for their silence was extraordinary. Nonetheless, the following became universally known: first that he maintains that the soul is immortal; next that it changes into other kinds of animals; also that events recur at certain intervals, and that nothing is ever absolutely new; and finally that all living things should be regarded as akin. Pythagoras seems to have been the first to introduce these beliefs to Greece. (Porphyry, *Life of Pythagoras* 19, tr. Kirk, Raven and Schofield w/ emendations)
- (2) Once [Pythagoras] passed by as a puppy was being beaten, the story goes, and in pity said these words: “Stop, don’t beat him, since it is the soul of a man, a friend of mine, which I recognized when I heard it crying”. (Xenophanes, DK 21B7, tr. McKirahan)
- (3) It is likely that as the eyes fasten on astronomical motions, so the ears fasten on harmonic ones, and that the science of astronomy and harmonics are closely akin. This is what the Pythagoreans say... They do the same as the astronomers. They seek out numbers that are to be found in these audible consonances... (Plato, *The Republic* 530d-531b, tr. Grube)
- (4) The Pythagoreans, as they are called, devoted themselves to mathematics and were the first to develop it. Through studying this science, they came to believe that its origins were the origins for all things. Now numbers are naturally the first of these origins. As a result, they thought they observed many resemblances in numbers to the things that are and that come into being—more resemblances than they observed in fire and earth and water. For one sort of modification of numbers, was justice, and another soul and intellect, another opportunity, and similarly for almost all other things. They also saw that attributes of the ratio of the musical scales were expressible in numbers. And since all other things seemed in their whole nature to be modeled on numbers, and numbers seemed to be the first elements of all things, they assumed that the whole heaven was a musical scale and a number. And they collected all the properties of numbers and scales, that they could show to correspond with the attributes and parts and the whole arrangement of the heavens, and they fitted them into their scheme; and if there was a gap anywhere, they readily made additions so as to make the whole theory coherent. (Aristotle, *Metaphysics* I.5 985b23-986a2, tr. based on Ross, Tredennick, and Hope)

D. HERACLITUS AND THE “HERACLITIZERS”

Heraclitus (c. 500 B.C.) was often referred to as “Heraclitus the obscure” by other Greek thinkers. We can understand why by the confusing nature of his surviving fragments. He was fond of paradoxes and wordplay. As a result of this and there was considerable disagreement as to what Heraclitus thought even in antiquity.

1. FIRE AND THE ACCOUNT:

Like his predecessors in the philosophical and mythological traditions, Heraclitus aims at a big-picture view of the universe. In the first fragment below, which is believed to be the introduction to his book, he promises to distinguish the nature of each thing by providing an account that describes (or, perhaps, governs) the way everything occurs. This may be difficult, however, because “nature loves to hide”. What, then, is Heraclitus’ account? It is not entirely clear, but fire seems to play a key role. Some of the fragments below suggest that he viewed fire more or less as the Milesians views their basic substances (water, the indefinite, air).

- (1) Although this account holds forever, men always fail to comprehend, both before hearing it and once they have heard. Although all things happen in accordance with this account, men are like the inexperienced when they come to experience such words and deeds as I set forth, distinguishing each according to its nature and telling how it is. But other men are oblivious of what they do awake, just as they are forgetful of what they do asleep. (Heraclitus, DK 22B1, tr. Kahn w/ emendations)
- (2) Nature loves to hide (Ibid., B123)
- (3) Listening not to me, but to the account it is wise to agree that all things are one. (Ibid., B50)
- (4) The world order, which is the same for all, neither god nor man has made, but it ever was and is and will be: fire ever-living, kindled in measures and in measures going out. (Ibid., B30, tr. Kahn w/ emendations).
- (5) Fire coming on will discern and catch up with all things (Ibid., B64, tr. Kahn)
- (6) Heraclitus says that at some time all things become fire. (Aristotle, *Physics* 205a3)
- (7) The turnings of fire: first sea; but of sea half is earth, half lightning storm. (Heraclitus, B76)
- (8) Fire lives the death of earth and air lives the death of fire, water lives the death of air, earth that of water. (Ibid., B76, tr. McKirahan)
- (9) All things are exchanged for fire, and fire for all things, as goods for gold and gold for goods. (Ibid., B90, tr. Kahn w/ emendations)

2. THE CO-PRESENCE OF OPPOSITES

A recurring theme in Heraclitus' writing is the co-presence of opposites. He often tells us that some object has both a certain feature and its opposite. It is not clear how far he carried this idea. Did he hold that everything that has any feature always also has the opposite feature, or merely that opposites are sometimes co-present? It is also not clear what to make of the cases of opposites that Heraclitus discusses. In at least some of the cases it seems that objects have opposite qualities only when viewed from different perspectives or in relation to different objects.

- (10) The road up and the road back are the same. (Ibid., B60, tr. McKirahan)
- (11) The beginning and end are shared in the circumference of a circle. (Ibid., B103, tr. Kahn)
- (12) The track of the carting wheels is straight and crooked (Ibid., B59, tr. McKirahan w/ emendations)
- (13) The sea is the purest and foulest water; for fish drinkable and healthy; for men undrinkable and deadly (Ibid., B61, tr. Kahn w/ emendations)
- (14) It is not better for men to get all they want. It is disease that makes health sweet and good, hunger satiety, weariness rest. (Ibid., B110-111)
- (15) [Some people argue] for example, that good and evil are the same thing, as Heraclitus says. (Aristotle, *Topics* 105b30)

3. UNITY IN OPPOSITION:

Heraclitus' interest in opposites went beyond pointing out unnoticed oppositions. He held that opposition leads unity. Where Anaximander explained natural cycles in terms of opposite qualities seeking vengeance for past injustices, Heraclitus contends that this strife between opposites *is* justice. He points to objects like bows, which owe their stability to the struggle between opposing forces. This idea seems to be central to his account, which is supposed to distinguish the (possibly hidden) natures of things and show how all things are one. Heraclitus tells us that a hidden connection or unity is stronger than an apparent one. Perhaps, then this "unapparent attunement" is the one that holds between opposites.

- (16) The opposed unites and from the difference comes the most beautiful attunement² and everything comes to be in accordance with strife. (Ibid., B8)
- (17) They do not understand how, though opposed to itself, it agrees with itself; it is a backwards-stretching³ attunement, like that of the bow and the lyre. (Ibid., DK ?? tr. McKirahan w/ emendations)
- (18) It rests by changing. (Ibid., B84)
- (19) Homer was wrong when he said "Would that strife might vanish from among gods and men!" For there would be no attunement without high and low notes, nor any

² *harmonia*, alt. "connection", "agreement", "harmony"

³ or, "backwards-turning"

animals without male and female, both of which are opposites. (Ibid., A22, tr. Kahn w/ emendations)

- (20) One must realize that war is shared and that strife is justice, and that all things come to pass in accordance with strife (Ibid., B80, tr. Kahn w/ emendations)
- (21) Graspings: wholes and not wholes, convergent divergent, consonant dissonant, from all things one and from one thing all. (Ibid., B18, tr. Kahn)
- (22) An unapparent attunement is stronger than an apparent one. (Ibid., B54)

4. OPPOSITES AND CHANGE:

We saw how Anaximander used opposites to explain certain changes (e.g. the cycle of the seasons), so it should come as no surprise that Heraclitus' interest in opposites is related to an interest in change. Heraclitus seems to draw a connection between the co-presence of opposites and the nature of change. When something changes, it becomes what it was not. For example, a man cannot become an expert on a subject if he is already an expert. In order to *change* into an expert, he needs to be a non-expert—a layman. After a lot of study, a layman becomes an expert and, at the end of this change, *the layman is an expert*. But that is a case of the co-presence of opposites. And what if an expert forgets his special knowledge? Then *the expert is a novice*, again a case of the co-presence of opposites. Every change would seem to work this way. It is cold things that get warm, dry things that get wet, living things that die, etc.

- (23) Cold warms up, warm cools off, moist parches, dry dampens. (Ibid., B126, tr. Kahn)
- (24) The same thing is both living and dead, the waking and the sleeping, young and old; for these things transformed are those and those transformed back again are these. (Ibid., B88 tr. McKirahan)

5. FLUX:

So far what do we know of Heraclitus' account? Everything either is (or is convertible into, or is exchangeable for) fire. Perhaps the significance of fire is that it is always changing or that it causes changes in other things. In any event, Heraclitus is very interested in change, in opposition, and in the idea that unity somehow arises from opposition. There is opposition in change and unity comes from opposition. Perhaps the hidden unity to everything is that everything is and isn't its opposite and that everything is always changing? Is this Heraclitus' "account"? It is unclear. Aristotle and Plato attribute to Heraclitus the so-called "doctrine of Heraclitean Flux", the idea that everything is changing all the time in every respect, so that it is and is not what it was and was not. There are fragments that support this reading.

- (25) As they step into the same rivers other and still other waters flow upon them. (Ibid., B12, tr. Kahn)

- (26) One cannot step twice into the same river, nor can one grasp any mortal being⁴ in a stable condition, but it scatters and again gathers; it forms and dissolves and approaches and departs. (Ibid., B91, tr. Kahn w/ emendations)
- (27) We step into and we do not step into the same rivers, we are and we are not. (Ibid., B49a, tr. McKirahan)
- (28) Heraclitus' doctrine that all things are flowing and nothing holds fast... (Plato, *Cratylus* 401d, Tr. Reeve)
- (29) The view of Heraclitus that all things are in motion... (Aristotle, *Topics* 104b32)

6. FLUX AND THE IMPOSSIBILITY OF KNOWLEDGE:

The idea of Heraclitean flux leads to some strange consequences. If everything is always changing in every way, then how can anyone ever have knowledge of anything? From one moment to the next the person, the thing he knows about, and his knowledge of it are not what they were before. If this view were true, how could you even talk or think about anything? By the time you finished uttering a sentence all things you were talking about wouldn't exist anymore. Knowledge becomes unattainable and language meaningless. Aristotle attributes this view to certain followers of Heraclitus, amongst them Cratylus who was apparently so impressed by this argument that he stopped talking altogether.

- (30) In his youth, Plato first become familiar with Cratylus and with the Heraclitean beliefs that all sensible things are always flowing and that there is no knowledge of them. (Aristotle, *Metaphysics* 987a31-33 tr. Irwin and Fine)
- (31) Further, since they saw that all of this nature around us is in motion and that nothing can be said of what is changing, they said it is impossible to say anything true about what undergoes every sort of change in every respect. From this view, there blossomed the most extreme of the views we have mentioned, that of the self-styled Heraclitizers. This was the sort of view held by Cratylus, who ended up thinking he must say nothing and only moved his finger. He criticized Heraclitus for saying one could not step into the same river twice, for Cratylus thought one could not do it even once. (Aristotle, *Metaphysics* 1010a8-15 tr. Irwin and Fine)

The fact that Aristotle refers to these people not as "Heracliteans" but as "self-styled Heraclitizers" indicates that he did not attribute this view to Heraclitus himself. And indeed, it seems unlikely that Heraclitus held it, since he did claim to have knowledge of his account and of the natures of each thing. Most likely Heraclitus did not believe in Heraclitian flux, or else he did not notice that it implied the impossibility of knowledge and language. Whatever Heraclitus himself believed, the doctrine of flux will be important when we consider Plato and Aristotle.

7. ETHICS:

⁴ *ousia*, alt. "substance"

Many of Heraclitus' fragments reveal a concern with ethical and political questions. A few of these fragments will be of interest to us because they express views that will later be developed further by Socrates, Plato, and Aristotle.

- (32) We should not listen like children to their parents. (Heraclitus, B74, tr. Kahn)
- (33) I searched myself. (Ibid., B101)
- (34) It belongs to all men to know themselves and to think well (Ibid., B116, tr. Kahn).
- (35) Thinking well is the greatest virtue and wisdom: to act and speak what is true, perceiving things according to their nature (Ibid., B112, tr. Kahn w/ emendations).
- (36) A man's character is his fate. (Ibid., B119)

E. PARMENIDES AND THE ELEATICS

Parmenides (c. 480 B.C.), like Heraclitus, is an extremely difficult thinker. He wrote a poem entitled *On Nature*, most of which has survived. The poem begins with a description of how Parmenides was carried by horses on “a renown” road to see a goddess. The remainder of the poem is the goddess’ speech to Parmenides. She tells him that there are two ways of inquiry, of which one is true and the other is false but “believed by mortals”. She explains each of the two ways.

The way of mortal opinion, (which the goddess explains “so that no mortal opinion may ever overtake” Parmenides) is a relatively typical pre-Socratic account of the universe. It explains various phenomena in terms of the interplay of two opposites, light and night. However, Parmenides’ goddess is critical of this way “on which mortals, knowing nothing, two-headed wander”:

- (1) For helplessness in their breasts guides their wandering mind. But they are carried on equally deaf and blind, amazed, hordes without judgment, for whom both to be and not to be are judged the same and not the same, and the path of all is backward-turning. (Parmenides, DK 28B6, tr. McKirahan w/ emendations.)

The significance of Parmenides’ poem lies in the way of truth. It begins from the premises that what is is and has to be and that what is not is not and cannot be. From these ideas, Parmenides reaches such counterintuitive conclusions that there is no such thing as change or movement and that the whole universe is a static homogenous sphere.

When we looked at Heraclitus, we noticed that change involves contraries. In order for something to come to be, it has to not be at the beginning. But, according to Parmenides, what is not cannot be. So there cannot be any change.

Everything has to be one because if there were more than one thing, the things would have to be different. But in order for two things to be different, each has to *not* be what the other is. But what is *not* cannot be, so nothing can be different, and everything has to be one. Thus, the world that we perceive with many different, changing things must be an illusion and the true reality must be static and unitary.

- (2) There is still left a single story of a way: that it is. On this way there are exceedingly many signs that, being ungenerated, it is also imperishable, whole and of a single kind and unshaken and complete. Nor was it ever nor will it be, since it is now, all together, one, continuous. For what birth will you seek for it?

How and from where did it grow? I will not permit you to say or to think [that it grew] from what is not; for it is not to be said or thought that it is not. What necessity would have stirred it up to grow later rather than earlier, beginning from nothing?! Thus it must either fully be or not. Nor will the force of conviction ever permit anything to come to be from what is not, besides it [i.e., besides what is not]. For this reason, Justice has permitted it [i.e., being] neither to come to be nor to perish, relaxing her shackles, but holds fast. But the decision about these matters lies in this: It is or It is not. But it has been decided, as is necessary, to let go of the one way [i.e., that it is not] as unthinkable and nameless (for it is not a true way) and that the other [way] is and is real. How could what is be in the future? How could it come to be?

For if it came into being, it is not, nor is it is ever going to be. In this way, coming to be has been extinguished and destruction is unheard of. Nor is it divided, since it all

is alike; nor is it any more in any way, which would keep it from holding together, or any less, but it is all full of being. Therefore, it is all continuous, for being draws near to being. But unchanging in the limits of great bonds, it is, without start or finish, since coming to be and destruction were banished far away and true conviction drove them off. Remaining the same in the same and by itself it lies and so stays there fixed; for mighty Necessity holds it in the bonds of a limit, which pens It in all round, since it is right for what is to be not incomplete; for it is not lacking; if it were, it would lack everything. Thinking and the thought that it is are the same. For not without being, in which it is expressed, will you find thinking; for nothing else either is or will be except that which is, since Fate shackled it to be whole and unchanging; wherefore it has been named all things mortals have established, persuaded that they are true – to come to be and to perish, to be and not [to be], and to change place and alter bright color. But since there is a furthest limit, It is complete on all sides, like the bulk of a well-rounded ball, evenly balanced in every way from the middle; for it must be not at all greater or smaller here than there. For neither is there non-being – which would stop it from reaching its like – nor is being in such a way that there could be more being here and less there, since it is all inviolate; for equal to itself on all sides, it meets with its limits uniformly. (Parmenides, DK 8, tr. McKirahan w/ emendations)

Because Parmenides writing is so obscure, it may be helpful to look at a similar, but easier to follow, argument made by one of his followers, Melisus (c. 440 B.C.).

- (3) Whatever was always was and always will be For if it came to be, it is necessary that before it came to be it was nothing. Now if it was nothing, in no way could anything come to be out of nothing. (Melisus, DK 30B1, Tr. McKirahan)
- (4) But it is not possible for it to be rearranged either. For the arrangement that previously was is not destroyed and an arrangement that is does not come to be. But when nothing either comes to be in addition or is destroyed or becomes different, how could anything that is be rearranged? For if it becomes at all different, it would already be rearranged. (Ibid, DK 30b7)
- (5) If there were many things, they would have to be such as I say the one is. For if there is earth and water and air and fire and iron and gold, and all the other things people say are real – if indeed these things are and we see and hear correctly, each must be such as we decided at first, and must not change or come to be different, but each thing must always be just as it is.

But as the case stands, we see and hear and understand correctly. We think that what is hot becomes cold and what is cold, hot, and what is hard becomes soft, and what is soft, hard, and what is alive dies and comes to be from what is not alive, and all these things become different, and anything that was and what is now are not at all alike, but iron, which is hard, is worn away by contact with the finger, and also gold and stone and everything else that seems to be strong, and earth and stone come to be from water.

Now these things do not agree with one another. For we say that there are many things that are eternal and have forms and strength, but all of them seem to us to become different and change from what we see at each moment.

Now it is clear that we were not seeing correctly and that the plurality does not correctly seem to be. For they would not change if they were real, but would be as each of them seemed. For nothing is stronger than what is real.

But if it changes, what is destroyed (and what is not) has come to be. Thus if there are many, they must be like the one [but when we think there are many, we don't think they are like the one, so there must not really be many]. (Ibid, DK 30b8)

Parmenides had a small group of followers, the Eleatics (named after the city of Elea where Parmenides lived). They include Melissus (quoted above) and Zeno (who devised a series of paradoxes to prove that motion was impossible). However, Parmenides' radical conclusion was not widely accepted. Philosophers continued to study the natural world, complete with plurality and change. But their study was influenced by Parmenides. While they denied Parmenides' conclusion that change was impossible, they agreed with him that coming to be and passing away (strictly speaking) were impossible—that it is impossible for something not to be and then to come into existence. So they tried to explain changes in which things seem to come into or go out of existence in other terms.

F. ANAXAGORAS

Anaxagoras (c.498-428) held that there are many different things, but that they are all mixed together, so that “seeds” of each thing are in every other thing. Initially, all things were mixed together homogeneously. Since then, various things have been partially separated out, giving rise to the different sorts of things we see around us. More interesting for our purposes, however, is Anaxagoras’ idea of Mind⁵, which he conceived as a force that caused the separation and ordering of all things by initiating a rotating motion.

- (1) The Greeks are wrong to speak of coming into being and passing away; for nothing comes into being or passes away, but there is mingling and separation of things that are. So they would be right to call coming into being “mixture”, and passing away “separation”. (Anaxagoras, DK 59B17, tr. Burnet w/ emendations)
- (2) All things were together, infinite both in number and in smallness; for the small too was infinite. And, when all things were together, none of them could be distinguished for their smallness... (Ibid B1)
- (3) And since these things are so, we must suppose that there are contained many things and of all sorts in the things that are uniting, seeds of all things, with all sorts of shapes and colors and flavors... But before, they were separated off, when all things were together, not even was any color distinguishable: for the mixture of all things prevented it—of the moist and the dry, and the warm and the cold, and the light and the dark, and of much earth that was in it, and of a multitude of innumerable seeds in no way like each other. For none of the other things either is like any other. And these things being so, we must hold that all things are in the whole. (Ibid B4)
- (4) The things that are in one world are not divided nor cut off from one another with an axe, neither the warm from the cold nor the cold from the warm. (Ibid B8)
- (5) In everything there is a portion of everything except Mind, and there are some things in which there is Mind also. (Ibid B11)
- (6) Mind is the finest and the purest of all things, and it has all knowledge about everything and the greatest strength; and Mind has power over all things, both greater and smaller, that have life. And Mind had power over the whole revolution, so that it began to revolve in the beginning. And it began to revolve first from a small beginning; but the revolution now extends over a larger space, and will extend over a larger still. And all the things that are mingled together and separated off and distinguished are all known by Mind. And Mind set in order all things that were to be, and all things that were and are not now and that are, and this revolution in which now revolve the stars and the sun and the moon, and the air and the *aether* that are separated off. And this revolution caused the separating off, and the rare is separated off from the dense, the warm from the cold, the light from the dark, and the dry from the moist. And there are many portions in many things. But no thing is altogether separated off nor distinguished from anything else except Mind. And all Mind is alike, both the greater and the smaller; while nothing else is like anything else, but

⁵ *nous*

each single thing is and was most manifestly those things of which it has most in it. (Ibid B12)

- (7) And when Mind began to move things, separating off took place from all that was moved, and so much as Mind set in motion was all separated. And as things were set in motion and separated, the revolution caused them to be separated much more. (Ibid 13)

G. EMPEDOCLES

Empedocles (c.493-c.433) introduced an idea that has been central to science ever since: the distinction between elements and compounds. He held that there are four elements (earth, air, fire, and water), and that other things are compounds – mixtures of the four elements in various proportions. Following Parmenides, the elements could not come to be, pass away, or change; they could only combine, separate, and recombine, thus causing compounds to come to be and pass away. In addition to the four elements, Empedocles also posited two forces Love and Strife, which he thought were responsible for the combination and separation of the elements. Empedocles held that the universe undergoes cycles whereby Love unites everything into one whole that is then broken apart by Strife, only to be re-united by love again, starting a new cycle. Of special interest to us will be Empedocles' theory of the origins of animals. He held that animals of different sorts arise by chance physical processes and that only the fit animals survive.

- (1) There is no coming into being of anything that perishes, nor any end for it in deadly death; but only mixture and separation of what is mixed. Coming into being is but a name given to these by men. (Empedocles, DK31B8, tr. Burnet w/ emendations)
- (2) I shall tell thee a twofold tale. At one time it grew together to be only one out of many, at another it parted so as to be many instead of one: Fire and Water and Earth and the mighty height of Air; dread Strife, too, apart from these, of equal weight to each, and Love among them, equal in length and breadth. [...] For all these [elements] are equal and alike in age, yet each has a different prerogative and its own peculiar nature. And nothing comes into being besides these, nor do they pass away; for, if they had been passing away continually, they would not be now, and what could increase this All and whence could it come? How, too, could it perish, since no place is empty of these things? They are what they are; but, running through one another, they become now this, now that, and like things evermore. (Ibid B17)
- (3) When they are in strife all these [elements] are different in form and separated; but they come together in love, and are desired by one another. For out of these have sprung all things that were and are and shall be—trees and men and women, beasts and birds and the fishes that dwell in the waters, yea, and the gods that live long lives and are exalted in honor. For these things are what they are; but, running through one another, they take different shapes—so much does mixture change them. (Ibid B21)
- (4) By Love many heads sprung up without necks and arms wandered bare and deprived of shoulders. Eyes strayed up and down in want of foreheads. (Ibid B57)
- (5) Solitary limbs wandered seeking for union. (Ibid 58)
- (6) But, as divinity was mingled still further with divinity, these things joined together as each might chance, and many other things besides them continually arose. (Ibid 59)
- (7) Shambling creatures with countless hands. (Ibid 60)
- (8) Many creatures with faces and breasts looking in different directions were born; some, offspring of oxen with faces of men, while others, again, arose as offspring of men with the heads of oxen, and creatures in whom the nature of women and men was mingled, furnished with sterile parts. (Ibid 61)

- (9) Come now, hear how the Fire as it was separated caused the night-born shoots of men and tearful women to arise; for my tale is not off the point nor uninformed. Whole-natured forms first arose from the earth, having a portion both of water and fire. These did the fire, desirous of reaching its like, send up, showing as yet neither the charming form of women's limbs, nor yet the voice and parts that are proper to men. (Ibid 62)
- (10) Empedocles [said] that many things belong to animals because they come about coincidentally in the course of the animals' coming to be. He says' for instance, that the back bone has vertebrae because of the coincidence that the fetus got twisted and the backbone was broken. (Aristotle, *Parts of Animals* 640a18, tr. Irwin and Fine)

H. THE ATOMISTS

Anaxagoras and Empedocles responded to Parmenides' view that nothing can come to be by postulating basic substances which do not come to be, but which can be rearranged, giving rise to changes we see in the world around us. Empedocles seems to have conceived of his elements as fluids that can "run through each other" and intermingle. Anaxagoras also seemed to have the view that the various substances are continuous like fluids. He insisted that there was no smallest particle, but that any quantity could be further divided. A third response to Parmenides was made by Leucippus (c. 440 B.C.), about whom virtually nothing is known, and his student Democritus (c.460-c.370 B.C.). These thinkers postulated smallest particles, which could not be further subdivided. The particles were called "atoms", meaning "uncuttable". Each atom is like a Parmenides' universe: single, indivisible and changeless. Reality consists of atoms in an empty space ("the void"). All the objects we meet in perception are temporary combinations of atoms.

- (1) Democritus believes that the nature of the eternal things is small beings⁶ unlimited in multitude. As a place for these, he hypothesizes something else, unlimited in size, and he calls this place by the names "void", "nothing", and "unlimited", and he calls each of the beings "thing" and "compact" and "what is"⁷. He holds that the beings are so small that they escape our senses. They have all kinds of forms and shapes and differences in size. He generates and combines visible and perceptible bodies out of these as elements. These beings contend with one another and move in the void on account of their dissimilarity and the other differences I have mentioned, and as they move they strike against one another and become entangled in a way that makes them be in contact and close to one another, but does not make anything out of them that is truly one, for it is quite foolish to think that two or more things come ever to be one. The grounds that he gives for why the beings stay together up to a point are that the bodies fit together and hold each other fast. For some of them are rough, some are hooked, others concave and others convex, while yet others have innumerable other differences. They cling to each other and stay together until some stronger necessity comes along from the environment and shakes them apart. He describes the generation and its contrary, separation, not only for animals, but also for plants, worlds, and altogether for all perceptible bodies. (Aristotle, quoted by Simplicius, DK 68A37, tr. McKirahan w/ emendations)
- (2) Democritus and Leucippus say that everything else is composed of indivisible bodies that are infinite both in number and in their shapes, and that differences in these components and in their position make the compounds different from each other. (Aristotle, *Generation and Corruption*, 1314a21, tr. Irwin and Fine)
- (3) He makes sweet that which is round and good-sized; stringent that which is large, rough, polygonal, and not rounded; sharp tasting, as its name indicates, that which is sharp in body, and angular, bent and not rounded; pungent that which is not round and small and angular and bent; salty that which is angular and good-sized and crooked and equal sided; bitter that which is round and smooth, crooked and small sized; oily that which is fine and small. (Theophrastus, DK68A129, tr. McKirahan)

⁶ *ousia*, alt. "substances"

⁷ *to on*, alt. "being".

- (4) By convention, sweet; by convention, bitter; by convention, hot; by convention, cold; by convention, color; but in reality, atoms in the void. (Democritus, DK B69, tr. McKirahan)