2. THE MILESIANS

Thales, Anaximander, and Anaximenes were all from the city of Miletus in Ionia (now the western coast of Turkey) and make up what is referred to as the Milesian "school" of philosophy. Tradition reports that Thales was the teacher of Anaximander, who in turn taught Anaximenes. Aristotle begins his account of the history of philosophy as the search for causes and principles (in Metaphysics I*) with these three.*

2.1. Thales

Thales appears on lists of the seven sages of Greece, a traditional catalog of wise men. The chronicler Apollodorus suggests that he was born around 625 BCE. We should accept this date only with caution, as Apollodorus usually calculated birthdates by assuming that a man was forty years old at the time of his "acme," or greatest achievement. Thus, Apollodorus arrives at the date by assuming that Thales indeed predicted an eclipse in 585 BCE, and was forty at the time. Plato and Aristotle tell stories about Thales that show that even in ancient times philosophers had a mixed reputation for practicality.

1. (11A9) They say that once when Thales was gazing upwards while doing astronomy, he fell into a well, and that a witty and charming Thracian serving-girl made fun of him for being eager to know the things in the heavens but failing to notice what was just behind him and right by his feet.

(Plato, *Theaetetus* 174a)

2. (11A10) The story goes that when they were reproaching him for his poverty, supposing that philosophy is useless, he learned from his astronomy that the olive crop would be large. Then, while it was still winter, he obtained a little money and made deposits on all the olive presses both in Miletus and in Chios, and since

no one bid against him, he rented them cheaply. When the time came, suddenly many requested the presses all at once, and he rented them out on whatever terms he wished, and so he made a great deal of money. In this way he proved that philosophers can easily be wealthy if they wish, but this is not what they are interested in.

(Aristotle, *Politics* 1.11 1259a9–18)

Thales reportedly studied astronomy (there is evidence for his interest in eclipses, whether or not he had anything to say about the eclipse of 585 BCE), geometry (he was said to have introduced the subject into Greece from Egypt), and engineering (Herodotus reports that he changed the course of the Halys river in order to aid the Lydian army). In his account of the cosmos, Thales reportedly said that the basic stuff was water: This could mean that everything comes from water as the originating source, or that everything really is water in one form or another. Aristotle, the source of the reports, seems unsure about which of these propositions Thales adopted. This shows that even by Aristotle's time, Thales was probably not known by any direct written evidence, but only indirectly. According to the tradition that Aristotle follows, Thales also said that the earth rests or floats on water. Aristotle also reports that Thales thought that soul produces motion and that a magnetic lodestone has soul because it causes iron to move.

3. Thales said that the sun suffers eclipse when the moon comes to be in front of it, the day in which the moon produces the eclipse being marked by its concealment.

(*P.Oxy.* 53.3710, col. 2, 37–40; not in DK)

4. Causes are spoken of in four ways, of which . . . one is matter. . . . Let us take as associates in our task our predecessors who considered the things that are and philosophized about the truth, for it is clear that they too speak of certain principles and causes, and so it will be useful to our present inquiry to survey them: either we will find some other kind of cause or we will be more confident about the ones now being discussed.

(Aristotle, *Metaphysics* 1.3 983a26–b6; not in DK)

5. (11A12) Of those who first pursued philosophy, the majority believed that the only principles of all things are principles in the form of matter. For that of which all existing things are composed and that from which they originally come to be and that into which they finally perish—the substance persisting but changing in its attributes—this they state is the element and principle of the things that are. . . . For there must be one or more natures from which the rest come to be, while it is preserved. However, they do not all agree about how many or what kinds of such principles there are, but Thales, the founder of this kind of philosophy, stated it to be water. (This is why he declared that the earth rests on water.) He may have gotten this idea from seeing that the nourishment of all things is moist, and that even the hot itself comes to be from this and lives on this (the principle of all things is that from which they come to be)—getting this idea from this consideration and also because the seeds of all things have a moist nature; and water is the principle of the nature of moist things.

(Aristotle, *Metaphysics* 1.3 983b6–27)

6. (11A14) Some say [the earth] rests on water. This is the oldest account that we have inherited, and they say that Thales of Miletus said this. It rests because it floats like wood or some other such thing (for nothing is by nature such as to rest on air, but on water). He says this just as though the same argument did not apply to the water supporting the earth as to the earth itself!

(Aristotle, *On the Heavens* 2.13 294a28–34; tpc)

7. (11A22) Some say the soul is mixed in with the whole universe, and perhaps this is why Thales supposed that all things are full of gods.

(Aristotle, *On the Soul* 1.5 411a7–8; tpc)

8. (11A22) From what is related about him, it seems that Thales too held that the soul is something productive of motion, if indeed he said that the lodestone has soul, because it moves iron.

(Aristotle, *On the Soul* 1.2 405a19–21; tpc)

2.2. Anaximander

*Diogenes Laertius says that Anaximander was sixty-four years old in 547/6 BCE, and this dating agrees with the ancient reports that say that Anaximander was a pupil or follower of Thales. He was said to have been the first person to construct a map of the world, to have set up a gnomon at Sparta, and to have predicted an earthquake. Anaximander makes the originating stuff of the cosmos something indefinite or boundless (*apeiron *in Greek; later the word can also mean "infinite"). This indefinite stuff is moving, directive of other things, and eternal; thus it qualifies as divine. The* apeiron *gives rise to something productive of hot and cold, but Anaximander does not say what this "something productive of hot and cold" is. The hot takes the form of fire, the origin of the sun and the other heavenly bodies; while the cold is a dark mist that can be transformed into air and earth. Both air and earth are originally moist, but become drier because of the fire. In the first changes from the originating* apeiron, *Anaximander postulates substantial opposites (the hot, the cold) that act on one another and that are in turn the generating stuffs for the sensible world. The reciprocal action of the opposites is the subject of B1, the only direct quotation we have from Anaximander (and the extent of the quotation is disputed by scholars). Here he stresses that changes in the world are not capricious, but are ordered; with the mention of justice and retribution he affirms that there are lawlike forces guaranteeing the orderly processes of change between opposites. Anaximander also had theories about the natures of the heavenly bodies and why the earth remains fixed where it is. He made claims about meteorological phenomena, and about the origins of living things, including human beings.*

9. (12A9 + 12B1) Of those who declared that the *arkhē*[1] is one, moving and *apeiron,* Anaximander . . . said that the *apeiron* was the *arkhē* and element of things that are, and he was the first to introduce this name for the *arkhē* [that is, he was the first to call the *arkhē apeiron*]. (In addition he said that motion is eternal, in which it occurs that the heavens come to be.) He says that the *arkhē* is neither water nor any of the other things called elements, but some other nature which is *apeiron,* out of which come to be all the heavens and the

1. The word *arkhē* is left untranslated here. It means "originating point" or "first principle."

worlds in them. The things that are perish into the things from which they come to be, according to necessity, for they pay penalty and retribution to each other for their injustice in accordance with the ordering of time, as he says in rather poetical language.

(Simplicius, *Commentary on Aristotle's Physics* 24.13–21)

10. (12A11) He says that the *arkhē* is neither water nor any of the other things called elements, but some nature which is *apeiron,* out of which come to be all the heavens and the worlds in them. This is eternal and ageless and surrounds all the worlds. . . . In addition he said that motion is eternal, in which it occurs that the heavens come to be.

(Hippolytus, *Refutation of All Heresies* 1.6.1–2)

11. (12A15) This [the infinite, *apeiron*] does not have an *arkhē,* but this seems to be the *arkhē* of the rest, and to contain all things and steer all things, as all declare who do not fashion other causes aside from the infinite [the *apeiron*] . . . and this is the divine. For it is deathless and indestructible, as Anaximander and most of the natural philosophers say.

(Aristotle, *Physics* 3.4 203b10–15)

12. (12A10) He declares that what arose from the eternal and is productive of [or, "capable of giving birth to"] hot and cold was separated off at the coming to be of this *kosmos,* and a kind of sphere of flame from this grew around the dark mist about the earth like bark about a tree. When it was broken off and enclosed in certain circles, the sun, moon, and stars came to be.

(Pseudo-Plutarch, *Miscellanies* 2)

13. (12A21) Anaximander says that the sun is equal to the earth, and the circle where it has its vent and on which it is carried is twenty-seven times <the size> of the earth.

(Aëtius 2.21.1)

14. (12A18) Anaximander says that the stars are borne by the circles and spheres on which each one is mounted.

(Aëtius 2.16.5)

15. (12A11) The earth is aloft and is not supported by anything. It stays at rest because its distance from all things is equal. The earth's shape is curved, round, like a stone column. We walk on one of the surfaces and the other one is set opposite. The stars come to be as a circle of fire separated off from the fire in the *kosmos* and enclosed by dark mist. There are vents, certain tube-like passages at which the stars appear. For this reason, eclipses occur when the vents are blocked. The moon appears sometimes waxing, sometimes waning as the passages are blocked or opened. The circle of the sun is twenty-seven times <that of the earth and> that of the moon <eighteen times>, and the sun is highest, and the circles of the fixed stars are lowest. Winds occur when the finest vapors of dark mist are separated off and collect together and then are set in motion. Rain results from the vapor arising from the earth under the influence of the sun. Lightning occurs whenever wind escapes and splits the clouds apart.

(Hippolytus, *Refutation of All Heresies* 1.6.3–7)

16. (12A23) Anaximander says that these [thunder, lightning, thunderbolts, waterspouts, and hurricanes] all result from wind. For whenever it [wind] is enclosed in a thick cloud and forcibly escapes because it is so fine and light, then the bursting [of the cloud] creates the noise and the splitting creates the flash against the blackness of the cloud.

(Aëtius 3.3.1)

17. (12A26) Some, like Anaximander . . . declare that the earth stays at rest because of equality. For it is no more fitting for what is situated at the center and is equally far from the extremes to move up rather than down or sideways. And it is impossible for it to move in opposite directions at the same time. Therefore, it stays at rest of necessity.

(Aristotle, *On the Heavens* 2.13 295b11–16)

18. (12A30) Anaximander says that the first animals were produced in moisture, enclosed in thorny barks. When their age advanced they came out onto the drier part, their bark broke off, and they lived a different mode of life for a short time.

(Aëtius 5.19.4)

19. (12A10) He also declares that in the beginning humans were born from animals of a different kind, since other animals quickly manage on their own, and humans alone require lengthy nursing. For this reason they would not have survived if they had been like this at the beginning.

(Pseudo-Plutarch, *Opinions* 2)

20. (12A30) Anaximander . . . believed that there arose from heated water and earth either fish or animals very like fish. In these, humans grew and were kept inside as embryos up to puberty. Then finally they burst, and men and women came forth already able to nourish themselves.

(Censorinus, *On the Day of Birth* 4.7)

2.3. Anaximenes

Ancient sources say that Anaximenes was a younger associate or pupil of Anaximander. Like Anaximander he agrees with Thales that there is a single originative stuff, but he disagrees with both Thales and Anaximander about what it is. He calls this basic stuff aēr *(usually translated "air," although* aēr *is more like a dense mist than what we think of as air, which is ideally transparent).* Aēr *is indefinite enough to give rise to the other things in the cosmos, but it is not as vague as Anaximander's* apeiron *(or indefinite). Anaximander seems to have left it unclear just what it is that comes from the* apeiron *and then produces the hot and the cold, and Anaximenes could well have argued that the* apeiron *was simply too indefinite to do the cosmic job Anaximander intended for it. In a major step away from Thales and Anaximander, Anaximenes explicitly includes condensation and rarefaction as the processes that transform* aēr *and the other stuffs of the cosmos. Like the other Presocratics, Anaximenes gave explanations of all sorts of meteorological and other natural phenomena.*

21. (13A5) Anaximenes . . . like Anaximander, declares that the underlying nature is one and unlimited [*apeiron*] but not indeterminate, as Anaximander held, but definite, saying that it is air. It differs in rarity and density according to the substances <it becomes>. Becoming finer, it comes to be fire; being condensed, it comes to be wind, then cloud; and when still further condensed, it becomes

water, then earth, then stones, and the rest come to be from these. He too makes motion eternal and says that change also comes to be through it.

(Theophrastus, quoted by Simplicius, *Commentary on Aristotle's Physics* 24.26–25.1)

22. (13B2) Just as our soul, being air, holds us together and controls us, so do breath and air surround the whole *kosmos*.

(Pseudo-Plutarch, *Opinions* 876AB)

23. (13A10) Anaximenes determined that air is a god and that it comes to be and is without measure, infinite, and always in motion.

(Cicero, *On the Nature of the Gods* 1.10.26)

24. (13A7) Anaximenes . . . declared that the principle is unlimited [*apeiron*] air, from which come to be things that are coming to be, things that have come to be, and things that will be, and gods and divine things. The rest come to be out of the products of this. The form of air is the following: when it is most even, it is invisible, but it is revealed by the cold and the hot and the wet, and by its motion. It is always moving, for all the things that undergo change would not change if it were not moving. For when it becomes condensed or finer, it appears different. For when it is dissolved into a finer condition it becomes fire, and on the other hand air being condensed becomes winds. Cloud comes from air through felting,[2] and water comes to be when this happens to a greater degree. When condensed still more it becomes earth, and when it reaches the absolutely densest stage it becomes stones.

(Hippolytus, *Refutation of All Heresies* 1.7.1–3)

25. (13B1) Or as Anaximenes of old believed, let us leave neither the cold nor the hot in the category of substance, but <hold them to be> common attributes of matter, which come as the results of its changes. For he declares that the contracted state of matter and the condensed state is cold, whereas what is fine and "loose" (calling

2. Translator's note: "Felting" is the production of nonwoven fabric by the application of heat, moisture, and pressure, as felt is produced from wool. The term here is extended to describe any other process in which the product is denser than and so has different properties from the ingredients.

it this way with this very word) 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 because of rareness.

(Plutarch, *The Principle of Cold* 7 947F)

26. (13A6) When the air was being felted the earth was the first thing to come into being, and it is very flat. This is why it rides upon the air, as is reasonable.

(Pseudo-Plutarch, *Miscellanies* 3)

27. (13A20) Anaximenes, Anaxagoras, and Democritus say that its flatness is the cause of its staying at rest. For it does not cut the air below but covers it like a lid, as bodies with flatness apparently do; they are difficult for winds to move because of their resistance. They say that the earth does this same thing with respect to the air beneath because of its flatness. And the air, lacking sufficient room to move aside, stays at rest in a mass because of the air beneath.

(Aristotle, *On the Heavens* 2.13 294b13–20)

28. (13A7) Likewise the sun and moon and all the other heavenly bodies, which are fiery, ride upon the air on account of their flatness. The stars came into being from the earth because moisture rises up out of it. When the moisture becomes fine, fire comes to be and the stars are formed of fire rising aloft. There are also earthen bodies in the region of the stars carried around together with them. He says that the stars do not move under the earth as others have supposed, but around it, as a felt cap turns around our head. The sun is hidden not because it is under the earth but because it is covered by the higher parts of the earth and on account of the greater distance it comes to be from us. Because of their distance the stars do not give heat.

(Hippolytus, *Refutation of All Heresies* 1.7.4–6)

29. (13A17) Anaximenes stated that clouds occur when the air is further thickened. When it is condensed still more, rain is squeezed out. Hail occurs when the falling water freezes, and snow when some wind is caught up in the moisture.

(Aëtius 3.4.1)

30. (13A21) Anaximenes declares that when the earth is being drenched and dried out it bursts, and earthquakes result from these hills breaking off and collapsing. This is why earthquakes occur in droughts and also in heavy rains. For in the droughts, as was said, the earth is broken while being dried out, and when it becomes excessively wet from the waters, it falls apart.

(Aristotle, *Meteorology* 2.7 365b6–12)

Suggestions for Further Reading

The Milesians

All of these entries have further bibliographies; see also the relevant chapters in Barnes and Guthrie. Complete bibliographical information for collections may be found in the bibliography in the Introduction, pp. 10–12.

Algra, K. "The Beginnings of Cosmology," in Long, pp. 45–65.

Gagarin, M. "Greek Law and the Presocratics," in Caston and Graham, pp. 19–24.

Hussey, E. "The Beginnings of Philosophy and Science in Archaic Greece," in Gill and Pellegrin, pp. 3–19.

Kahn, C. H. 1960, 1994. *Anaximander and the Origins of Greek Cosmology*. New York: Columbia University Press; reprint Indianapolis: Hackett.

McKirahan, R. "Anaximander's Infinite Worlds," in Preus, pp. 49–65.

Schofield, M. "The Ionians," in Taylor, pp. 47–87.

White, S. "Milesian Measures: Space, Time, and Matter," in Curd and Graham, pp. 89–133.

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