



Anaximander

**[Miletus, 610
- 546 BC]**

Anaximander like Thales came from Miletus. While our knowledge of Thales is based on uncertain historical accounts, we are in a better position with Anaximander. The later doxographers, including Aristotle, Plato and Theophrastus, had access to Anaximander's original writings and there are plenty of details reported about his ideas, although not much is known about his life. It is very likely that Anaximander was a pupil of Thales. In particular, the treatment of cosmology and ontology –which were Anaximander's principal studies– shows congeniality with Thales.

Anaximander made bold inquiries; he questioned the myths, the knowledge of the old, the heavens, and even the gods themselves. He was wholly rational in his approach and his quest was to derive natural explanations for phenomena that previously had been ascribed to the agency of supernatural powers. Meteorology is a perfect example for this. Anaximander explained the wind as the fine and moist effluvium of air massing together and set in motion by the sun. He explained rain as coming from vapour sent up

by the things beneath the sun. He also explained lighting and thunder and he affirmed that it is not Zeus who throws thunderbolts down upon the Earth, but that these phenomena have natural causes. According to Anaximander, they are caused by pneuma, or compressed air, which builds up inside thick clouds, until it breaks out. The forceful parting of the cloud then causes thunder and lightning.



His account of meteorology constitutes a most innovative proposition. Though only partially correct, it is the first recorded attempt of a scientific explanation of the weather in the history of mankind. But Anaximander did not stop there. He also founded the sciences of geography and astronomy. Moreover, he was the first man in Greece who drew a map of the known world, which was later refined by travellers and other scholars. This map places Ionia at the centre of the world. To the East it reaches to the Caspian sea, to the West it ends at the Pillars of Hercules (the rocks of Gibraltar and Mount Hacho in Morocco). In the North we see the landmass of Middle

Europe and in the South lies
Ethiopia and the lower Nile.

As if charting the known world wasn't enough, Anaximander began to chart the cosmos as well. This was beyond his understanding, as we shall see, but it constitutes one of the first attempts in the Western world of creating a speculative scientific model of the cosmos. Anaximander started by building a spherical model of the world, the planets, and the stars in which the planets lie behind one another. As a rationalist he did this on basis of geometry and mathematical calculations rather than by drawing on mythological accounts. He attempted to determine the distance of the planets from Earth as well as their size. The circle of the sun is –according to Anaximander–27 times as big as that of the Earth and the moon's circle is 19 times as big. He assumed that the moon shines its own light like the sun.

He further proposed that the sun and the stars are fires trapped in globular masses by cooler air. These fires appear to us not directly, but through vents a bit like that of a trumpet or a gramophone. “The heavenly bodies come into being as a circle of fire, separated off from the fire in the world and enclosed by air. There are certain tubular channels or breathing holes through which the heavenly bodies appear; hence eclipses occur when the breathing holes are blocked, and the moon appears sometimes waxing and sometimes waning according to whether the channels are blocked or

open.” (Hippolytus, Refutation of All Heresies I)

Anaximander believed that the Earth is cylindrical in shape, its diameter being three times its height, and that we are sitting on its flat circular surface on top of it. He held that the Earth is aloft, not supported by anything. Apparently he concluded this from the assumption that the heavenly bodies describe full circles around the Earth. He explained that it stays in that position, because it is at equal distance from all other heavenly bodies and thus does not move in any particular direction. The Earth is therefore in a state of balance and needs no support. This idea was fundamentally new. It contains –in its beginnings– the idea of gravitation. Anaximander’s account of the creation of the universe is likewise innovative:

“Anaximander maintains that the eternally productive cycles of hot and cold separated off in the generation of this world and formed a spherical shell of fire surrounding the Earth and its atmosphere like the bark around a tree. When this sheath of fire finally tore up and divided into various wheel-shaped stripes, the sun, moon and the stars were created from it.” (Pseudo Plutarch, Stromateis 2)

While there were many unique aspects in Anaximander’s meteorology, geography and cosmology, what he is ultimately known for is his theory of the apeiron. The apeiron is the Boundless or the Infinite.

Anaximander held that the universe is boundless and that the number of worlds in it is infinite. Thus the argument develops from the physical model of the cosmos and carries on the idea of cosmic balance into a striking metaphysical argument.

The apeiron is not plainly spatiotemporal infinity, but the principle and the origin (Greek: archê) of existence itself. Since very little of Anaximander's own words have survived, we have to turn to Aristotle for a description of the apeiron: "Everything has an origin or is an origin. The Boundless has no origin. For then it would have a limit. Moreover, it is both unborn and immortal, being a kind of origin. For that which has become has also, necessarily, an end, and there is a termination to every process of destruction." (Aristotle, Physics 203b6-10).

The apeiron is thus the quintessential primordial ground from which everything arises. Although we don't know whether Anaximander defined the apeiron in any precise manner, it was imagined as kind of primal chaos, a formless and limitless mass, from which solid matter forms and to which it returns. In Anaximander's own words: "Whence things have their origin, thence also their destruction happens, as is the order of things; for they execute the sentence upon one another - the condemnation for the crime - in conformity with the ordinance of time." (Simplicius).

