The PreSocratics
An Overview
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Introduction

Pre-Socratic philosophy

Pre-Socratic philosophy is Greek philosophy before Socrates. In Classical antiquity, the Presocratic philosophers were called *physiologoi* (in English, physical or natural philosophers).\(^1\) Diogenes Laërtius divides the *physiologoi* into two groups, Ionian and Italiote, led by Anaximander and Pythagoras, respectively.\(^2\)

Hermann Diels popularized the term *pre-socratic* in *Die Fragmente der Vorsokratiker (The Fragments of the Pre-Socratics)* in 1903. However, the term *pre-Sokratic* was in use as early as George Grote's *Plato and the Other Companions of Sokrates* in 1865. Major analyses of pre-Socratic thought have been made by Gregory Vlastos, Jonathan Barnes, and Friedrich Nietzsche in his *Philosophy in the Tragic Age of the Greeks*.

It may sometimes be difficult to determine the actual line of argument some Presocratics used in supporting their particular views. While most of them produced significant texts, none of the texts has survived in complete form. All that is available are quotations by later philosophers (often biased) and historians, and the occasional textual fragment.

The Presocratic philosophers rejected traditional mythological explanations of the phenomena they saw around them in favor of more rational explanations. These philosophers asked questions about "the essence of things":\(^3\)

- From where does everything come?
- From what is everything created?
- How do we explain the plurality of things found in nature?
- How might we describe nature mathematically?

Others concentrated on defining problems and paradoxes that became the basis for later mathematical, scientific and philosophic study.

Later philosophers rejected many of the answers the early Greek philosophers provided, but continued to place importance on their questions. Furthermore, the cosmologies proposed by them have been updated by later developments in science.

History

Western philosophy began in ancient Greece in the 6th century BCE. The Presocratics were mostly from the eastern or western fringes of the Greek world. Their efforts were directed to the investigation of the ultimate basis and essential nature of the external world.\(^4\) They sought the material principle (*archē*) of things, and the method of their origin and disappearance.\(^4\) As the first philosophers, they emphasized the graph showing the relationship among various pre-socratic philosophers and thinkers; red arrows indicate a relationship of opposition.
Pre-Socratic philosophy

rational unity of things, and rejected mythological explanations of the world. Only fragments of the original writings of the presocratics survive. The knowledge we have of them derives from accounts of later philosophical writers (especially Aristotle, Plutarch, Diogenes Laërtius, Stobaeus and Simplicius), and some early theologians, (especially Clement of Alexandria and Hippolytus).

Milesian school

The first Presocratic philosophers were from Miletus on the western coast of Anatolia. Thales (624-546 BCE) is reputed the father of Greek philosophy; he declared water to be the basis of all things. Next came Anaximander (610-546 BCE), the first writer on philosophy. He assumed as the first principle an undefined, unlimited substance without qualities, out of which the primary opposites, hot and cold, moist and dry, became differentiated. His younger contemporary, Anaximenes (585-525 BCE), took for his principle air, conceiving it as modified, by thickening and thinning, into fire, wind, clouds, water, and earth.

Pythagoreanism

The practical side of philosophy was introduced by Pythagoras of Samos (582-496 BCE). Regarding the world as perfect harmony, dependent on number, he aimed at inducing humankind likewise to lead a harmonious life. His doctrine was adopted and extended by a large following of Pythagoreans who gathered at his school in south Italy in the town of Croton. His followers included Philolaus (470-380 BCE), Alcmaeon of Croton, and Archytas (428-347 BCE).

Ephesian school

Heraclitus of Ephesus on the western coast of Anatolia in modern Turkey (535-475 BCE) posited that all things in nature are in a state of perpetual flux held together by a dynamic, eternal structure or pattern, which he termed the Logos. Metaphorically, Heraclitus had used the image of fire to represent this eternal pattern. From fire all things originate, and return to it again by a never-ending process of development.

Eleatic School

The Eleatic School, called after the town of Elea (modern name Velia in south Italy), emphasized the doctrine of the One. Xenophanes of Colophon (570-470 BCE), declared God to be the eternal unity, permeating the universe, and governing it by his thought. Parmenides of Elea (510-440 BCE), affirmed the one unchanging existence to be alone true and capable of being conceived, and multitude and change to be an appearance without reality. This doctrine was defended by his younger countryman Zeno of Elea (490-430 BCE) in a polemic against the common opinion which sees in things multitude, becoming, and change. Zeno propounded a number of celebrated paradoxes, much debated by later philosophers, which try to show that supposing that there is any change or multiplicity leads to contradictions. Melissus of Samos (born c. 470 BCE) was another eminent member of this school.

Pluralist School

Empedocles of Agrigentum (490-430 BCE) was from the ancient Greek city of Akragas. He appears to have been partly in agreement with the Eleatic School, partly in opposition to it. On the one hand, he maintained the unchangeable nature of substance; on the other, he supposes a plurality of such substances—e.g., four classical elements, earth, water, air, and fire. Of these the world is built up, by the agency of two ideal motive forces—love as the cause of union, strife as the cause of separation. Anaxagoras of Clazomenae (500-428 BCE) in Asia Minor, also maintained the existence of an ordering principle as well as a material substance, and while regarding the latter as an infinite multitude of imperishable primary elements; he conceived divine reason or Mind (nous) as ordering them. He referred all generation and disappearance to mixture and resolution respectively. To him belongs the credit of first establishing philosophy at Athens.
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Atomist School
The first explicitly materialistic system was formed by Leucippus (5th century BCE) and his pupil Democritus of Abdera (460-370 BCE) from Thrace. This was the doctrine of atoms - small primary bodies infinite in number, indivisible and imperishable, qualitatively similar, but distinguished by their shapes. Moving eternally through the infinite void, they collide and unite, thus generating objects which differ in accordance with the varieties, in number, size, shape, and arrangement, of the atoms which compose them. [4]

Others
The last of the Presocratic natural philosophers was Diogenes of Apollonia from Thrace (born c. 460 BCE). He was an eclectic philosopher who adopted many principles of the Milesian school, especially the single material principle, which he identified as air. He explained natural processes in reference to the rarefactions and condensations of this primary substance. He also adopted Anaxagoras' cosmic thought.

Sophism
The Sophists held that all thought rests solely on the apprehensions of the senses and on subjective impression, and that therefore we have no other standards of action than convention for the individual. [4] Specializing in rhetoric, the Sophists were more professional educators than philosophers. They flourished as a result of a special need at that time for Greek education. Prominent Sophists include Protagoras (490-420 BCE) from Abdera in Thrace, Gorgias (487-376 BCE) from Leontini in Sicily, Hippias (485-415 BCE) from Elis in the Peloponnnesos, and Prodicus (465-390 BCE) from the island of Ceos.

Other early Greek thinkers
This list includes several men, particularly the Seven Sages, who appear to have been practical politicians and sources of epigrammatic wisdom, rather than speculative thinkers or philosophers in the modern sense.

- Seven Sages of Greece
  - Solon (c. 594 BCE)
  - Chilon of Sparta (c. 560 BCE)
  - Thales (c. 585 BCE)
  - Bias of Priene (c. 570 BCE)
  - Cleobulus of Rhodes (c. 600 BCE)
  - Pittacus of Mitylene (c. 600 BCE)
  - Periander (625-585 BCE)
- Aristeas of Proconnesus (7th century BCE ?)
- Pherecydes of Syros (c. 540 BCE)
- Anacharsis (c. 590 BCE)
Pre-Socratic philosophy

References


External links

• Presocratic Philosophy entry by Patricia Curd in the *Stanford Encyclopedia of Philosophy*

Notes


Philosophy in the Tragic Age of the Greeks

*Philosophy in the Tragic Age of the Greeks (Philosophie im tragischen Zeitalter der Griechen)* is a publication of an incomplete book by Friedrich Nietzsche. He had a clean copy made from his notes with the intention of publication. The notes were written around 1873. In it he discussed five Greek philosophers from the sixth and fifth centuries B.C.. They are Thales, Anaximander, Heraclitus, Parmenides, and Anaxagoras. He had, at one time, intended to include Democritus, Empedocles, and Socrates. The book ends abruptly after the discussion of Anaxagoras's cosmogony.

Early preface

Nietzsche stated that he wanted to present the outlooks of very worthy individuals who originated in ancient Greece from 600 B.C. to 400 B.C. "The task is to bring to light what we must ever love and honor...." Nietzsche wanted future humans to be able to say, "So this has existed – once, at least – and is therefore a possibility, this way of life, this way of looking at the human scene."

Later preface

By selecting only a few doctrines for each philosopher, Nietzsche hoped to exhibit each philosopher's personality.

A justification of philosophy

Nietzsche felt that it is important to know about these philosophers because they were dedicated to finding the truth about life and the world. Their concern was with the elaboration of their unique personal point of view. The pre-Socratics existed at a time when Greece was at its height. In such a time of wealthy and successful life, they had the strength and independence to question the general worth of existence. The tragedians of that age addressed the same issue with their plays.
With Plato, philosophers then lost their own individual stylistic unities. Their works and personalities were combinations of previous types. They became sectarian and didn't contribute to a unified culture. They did not live their lives in accordance with their personal outlooks. Plato and subsequent philosophers lacked a pure, unified style.

**Thales**

This philosopher proposed that water is the origin of all things. Nietzsche claimed that this must be taken seriously for three reasons.
1. It makes a statement about the primal origin of all things;
2. It uses language that has nothing to do with fable or myth;
3. It reflects the vision that all things are really one.

Thales' generalization was the result of creative imagination and analogy. He did not use reason, logical proof, myth, or allegory. This was a first attempt to think about nature without the use of myths about gods. However, instead of trying to gain knowledge of everything, he wanted to know the one important common property of all things.

In order to communicate his vision of oneness, he expressed himself by applying the analogy of water.

**Anaximander**

Anaximander of Miletus was the first philosopher who wrote his words. His most famous passage is, "The source of coming-to-be for existing things is that into which destruction, too, happens according to necessity; for they pay penalty and retribution to each other for their injustice according to the assessment of Time." This pessimistic expression presented existence as something that should not be. Any definite thing must pay for its individuality by, after a short time, passing back into its indefinite (apeiron) source. This source cannot also be definite. Therefore it is indefinite and does not pass away.

Anaximander was the first Greek to provide an ethical or moral interpretation of existence. By emerging from the primeval oneness, each definite individual thing must pay a price by returning. This meant that the individual, separate existence of each and every thing is unjust. It has no justification or value in itself.

His manner of living was in accordance with his thought. He dressed and spoke in a dignified, solemn manner. This unity of style was typical of the pre-Platonic philosophers.

**Heraclitus**

As the opposite of Anaximander, Heraclitus saw no injustice, guilt, evil, or penance in the emergence and disappearance of worldly objects. To him, continuous becoming and passing away is the order of nature. There is a wonderful fixed order, regularity, and certainty that shows itself in all change and becoming. Heraclitus did not think that there is a metaphysical, undefinable indefinite (apeiron) out of which all definite things come into existence. Also, he denied that there is any permanent being. Nietzsche paraphrased him as saying, "You use names for things as though they rigidly, persistently endured; yet even the stream into which you step a second time is not the one you stepped into before."

Heraclitus's way of thinking was the result of perception and intuition. He despised rational, logical, conceptual thought. His pronouncements were purposely self-contradictory. "We are and at the same time are not." "Being and nonbeing is at the same time the same and not the same." This intuitive thinking is based on seeing the changing world of experience which is conditioned by never-ending variations in time and space. Every object that is perceived through time and space has an existence that is relative to other objects. Nature and reality are seen as a continuous action in which there is no permanent existence.

The unending strife between opposites, which seek to re-unite, is a kind of lawful justice for Heraclitus. In accordance with the Greek culture of contest, the strife among all things follows a built-in law or standard.
According to Heraclitus, the one is the many. Every thing is really fire. In passing away, the things of the world show a desire to be consumed in the all-destroying cosmic fire. When they are part of the fire again, their desire is briefly satisfied. But things soon come into being again as a result of the fire's impulse to play a game with itself.

Due to the contradictions that occur in Heraclitus's brief sayings, he has been accused of being obscure. However, Nietzsche asserts that he was very clear. The shortness and terseness of Heraclitus's statements may seem to result in their obscurity, but Nietzsche stated that they are unclear only for readers who do not take the time to think about what is being said.

Nietzsche interpreted Heraclitus's words, "I sought for myself," as indicating that he possessed great self-esteem and conviction. Without concern as to whether his thoughts appealed to anyone beside himself, he pronounced that he saw fixed law in the continual change of becoming. Also, he intuited that the particular changes that occur with strict necessity are, on the whole, the play of a game. Heraclitus wanted future humanity to know his timeless truths.

**Parmenides**

Many of Parmenides's qualities were the direct opposite of Heraclitus. Heraclitus grasped his truths through intuition. He saw and knew the world of Becoming. Parmenides, however, arrived at his truths through pure logic. He calculated and deduced his doctrine of Being.

Parmenides had an early doctrine and a later, different, teaching. Nietzsche claimed that Parmenides's two ways of thinking not only divided his own life into two periods but also separated all pre-Socratic thinking into two halves. The earlier way was the Anaximandrean period. This dealt with two worlds: the world of Becoming and the world of Being. The second was the Parmenidean. In this world, there is no becoming, change, or impermanence. There is only Being.

The qualities of the world, Parmenides thought, were divided into opposites. There are positive qualities and there are their opposite negations. His division was based on abstract logic and not on the evidence of the senses. This dichotomy of positive and negative then became the separation into the existent and the nonexistent. For things to become, there must be an existent and a non-existent. Desire unites these opposites and creates the world of Becoming. When desire is satisfied, the existent and the nonexistent oppose each other and the things pass away.

Nietzsche did not think that an external event led to Parmenides's denial of Becoming. The influence of Xenophanes is made negligible by Nietzsche. Even though both men gave great importance to the concept of unity, Xenophanes communicated in ways that were alien to Parmenides. Xenophanes was a philosophical poet whose view of mystic unity was related to religion. He was an ethicist who rejected the contemporary values of Greece. Nietzsche claimed that the common attribute between Parmenides and Xenophanes was their love of personal freedom and unconventionality, not their emphasis on oneness.

The internal event that led to Parmenides's denial of Becoming began when he considered the nature of negative qualities. He asked himself whether something that has no being can have being. Logically, this was the same as asking whether A is not A. Parmenides then realized that what is, is. Also, what is not, is not. His previous thinking about negative qualities was then seen as being very illogical. Heraclitus's contradictory statements were considered to be totally irrational.

If that which is, is, and that which is not, is not, then several conclusions follow. That which truly is must be forever present. The existent also is not divisible, because there is no other existent to divide it. It is also immobile and finite. In sum, there is only eternal oneness.

The senses lead us to believe otherwise. Therefore, for Parmenides, the senses are illusive, mendacious, and deceitful. He accepted only his logical and rational conclusions. All sensual evidence was ignored. Parmenides only affirmed his extremely abstract, general truth which was totally unlike the reality of common experience.

Although logically certain, Parmenides's concept of being was empty of content. No sense perception illustrated this truth. "What is, is" is a judgement of pure thought, not experience. Nietzsche claimed that Parmenides created his
concept of being from his own personal experience of feeling himself as alive. He then illogically attributed this general concept of absolute being to everything in the world. Thus, Nietzsche saw being as a subjective concept that was mistakenly asserted to be objective. Nietzsche's paraphrase of Parmenides's truth was, "I breathe, therefore being exists."

Along with his disciple Zeno of Elea, Parmenides stated that there is no such thing as infinity. If infinity exists, it would be the indivisible, immobile, eternal unity of being. In other words, it would be finite. Zeno's examples of flying arrows and Achilles chasing a tortoise show that motion over an infinite space would be impossible. But we do experience motion. The world does exhibit finite infinity. Parmenides rejects, then, the perceivable world of motion and asserts that reality agrees only with his logical concepts, which do not include finite infinity. For him, thinking and being are the same. What he thinks is what exists.

Objections can be raised against Parmenides's principles that sensual perception does not show true reality and that thinking is unmoving being. If the senses are unreal, how can they deceive? If thinking is immobile being, how does it move from concept to concept? Instead, it can be stated that the many things that are experienced by the senses are not deceptive. Also, motion can have being. No objection, however, can be made to Parmenides's self-evident main teaching that there is being, or, what is, is.

**Anaxagoras**

Anaxagoras raised two objections against Parmenides:

1. the origin of semblance, and
2. the mobility of thought.

He did not object, however, to Parmenides's main doctrine that there is only being, not becoming. Anaximander and Heraclitus had claimed that there is becoming and passing away. Thales and Heraclitus had said that the world of multiple qualities comes out of one prime substance. With Anaxagoras, all subsequent philosophers and scientists rejected all coming into existence out of nothing and disappearance into nothing.

If the many things that we experience in the world are not mere semblance but do not come from nothing and do not come from one single thing, what is their origin? Since like produces like, the many different things come from many different things. In other words, there are infinitely many different prime substances. Their total is always constant but their arrangements change.

Why do the forms and patterns of these real substances change? Because they are in motion. Change and motion are not semblance and are truly real. Does the movement come from within each thing? Is there another external thing that moves each object?

Movement is not mere appearance. Movement occurs because each substance is similar to each other substance in that they are all made of the same matter. There is no total isolation or complete difference between substances. This common material substratum allows them to interact. When two substances try to occupy the same space, one of the substances must move away. This is actual motion and change.

If it is certain that our ideas appear to us in succession, then they must move themselves because they are not moved by things that are not ideas. This proves that there is something in the world that moves itself. Ideas are also capable of moving things that are different from themselves. They move the body. Therefore, there is a thinking substance that moves itself and other substances. This *nous* (mind, intelligence) is made out of extremely fine and delicate matter. It is an ordering, knowing, purposeful mover. *Nous* was the first cause of every subsequent mechanical change in the universe.

Originally, before *nous* moved the first particle of matter, there was a complete mixture which was composed of infinitely small components of things. Each of these was a homoeomery, the small parts being the same as the large whole. For example, a tooth is made of small teeth. This is the result of the thought that like must come from like. After the movement began, individual objects became separated from this mixture when like combined with like.
When one substance finally predominated, the accumulation became a particular thing. This process is called "coming to be" or "becoming."

Nous is not a part of the original mixture. It started the revolutionary motion which separated things from the primal mixture. The motion is a centrifugal, spiralling vortex in which likes attach to their likes. There is no god who moves things with a purpose in mind. There is only a mechanical whirlpool of movement. Unlike Parmenides's motionless sphere of being, Anaxagoras saw the world as a moving circle of becoming. Nous started the spinning. Thereafter the universe developed on its own, according to lawful necessity.

To be able to start and sustain motion against the resistance of the infinite mixture, nous had to use a sudden, infinitely strong and infinitely rapid, force. It also had to move the first point in a circular path that was larger than its own size. In this way, it affected other points. Nous freely chose to start the vortex. It thereby created its own goal and purpose in a playful game. This was not a moral or ethical process. Rather, it was aesthetic, in that nous simply wanted to enjoy the spectacle of its own creation.

Later philosophers, such as Plato, wanted to attribute ethical properties to nous's creation of the world. For them, it should be made in the most perfect, beautiful, useful manner. Anaxagoras, however, did not employ teleology. Nous, for him, was a mechanical, efficient cause, not a final cause. Any future purpose would have eliminated a freely chosen start.

Nietzsche's book abruptly ends here with a description of a nous that created the world as a game. The freedom of nous's creative will is opposed to the necessary determinism of its creation, the universe. Nous is referred to as a mind (Geist) that has free, arbitrary choice. The created world, physis, is a determined, mechanical piece of machinery. Any order or efficiency of things is only an outcome of purposeless change.

References

Classical element

Many philosophies and worldviews have a set of classical elements believed to reflect the simplest essential parts and principles of which anything consists or upon which the constitution and fundamental powers of anything are based. Most frequently, classical elements refer to ancient beliefs inspired by natural observation of the phases of matter. Historians trace the evolution of modern theory pertaining to the chemical elements, as well as chemical compounds and mixtures of natural substances to medieval, Islamic and Greek models. Many concepts once thought to be analogous, such as the Chinese Wu Xing, are now understood more figuratively.

Ancient classic element systems

In classical thought, the four elements Earth, Water, Air, and Fire frequently occur; sometimes including a fifth element or quintessence (after "quint" meaning "fifth") called Aether in ancient Greece.

In Greek thought, the philosopher Aristotle added aether as the quintessence, reasoning that whereas fire, earth, air, and water were earthly and corruptible, since no changes had been perceived in the heavenly regions, the stars cannot be made out of any of the four elements but must be made of a different, unchangeable, heavenly substance.[1]

The concept of essentially the same five elements was similarly found in ancient India, where they formed a basis of analysis in both Hinduism and Buddhism. In Hinduism, particularly in an esoteric context, the four states-of-matter describe matter, and a fifth element describes that which was beyond the material world (non-matter). Similar lists existed in ancient China and Japan. In Buddhism the four great elements, to which two others are sometimes added, are not viewed as substances, but as categories of sensory experience.

Classical elements in Babylonia

The concept of the four classical elements in the Western tradition originates from Babylonian mythology. The Enûma Eliš, a text written between the 18th and 16th centuries BC, describes four cosmic elements: the sea, earth, sky, and wind.[2]

Classical elements in Greece

The Greek classical elements (Earth, Water, Air, Fire, and Aether) date from pre-Socratic times and persisted throughout the Middle Ages and into the Renaissance, deeply influencing European thought and culture. The Greek five elements are sometimes associated with the five platonic solids.
Plato characterizes the elements as being pre-Socratic in origin from a list created by the Sicilian philosopher Empedocles (ca. 450 BC). Empedocles called these the four "roots" (ῥίζοματα, rhizomata). Plato seems to have been the first to use the term "element (στοιχεῖον, stoicheion)" in reference to air, fire, earth, and water.\[3\] The ancient Greek word for element, stoicheion (from stoicho, "to line up") meant "smallest division (of a sun-dial), a syllable", as the composing unit of an alphabet it could denote a letter and the smallest unit from which a word is formed.

According to Aristotle in his *On Generation and Corruption*:

- **Air** is primarily wet and secondarily hot.
- **Fire** is primarily hot and secondarily dry.
- **Earth** is primarily dry and secondarily cold.
- **Water** is primarily cold and secondarily wet.

One classic diagram (above) has one square inscribed in the other, with the corners of one being the classical elements, and the corners of the other being the properties. The opposite corner is the opposite of these properties, "hot - cold" and "dry - wet".

According to Galen, these elements were used by Hippocrates in describing the human body with an association with the four humours: yellow bile (fire), black bile (earth), blood (air), and phlegm (water).

### Classical elements in Hinduism

The *pancha mahabhuta*, or "five great elements", of Hinduism are *kshiti* or *bhūmi* (earth), *ap* or *jala* (water), *tejas* or *agni* (fire), *marut* or *pavan* (air or wind), *byom* or *shunya* (or akash?) (aether or void). Hindus believe that all of creation, including the human body, is made up of these five essential elements and that upon death, the human body dissolves into these five elements of nature, thereby balancing the cycle of nature set in motion by the Creator.

Hindus believe that the Creator used akasha (ether), the most "subtle" element, to create the other four traditional elements; each element created is in turn used to create the next element, each less subtle than the last. The five elements are associated with the five senses, and act as the gross medium for the experience of sensations. The basest element, Earth, created using all the other elements, can be perceived by all five senses - hearing, touch, sight, taste, and smell. The next higher element, water, has no odor but can be heard, felt, seen and tasted. Next comes fire, which can be heard, felt and seen. Air can be heard and felt. "Akasha" (ether) is the medium of sound but is inaccessible to all other senses.
Buddhist elements

In the Pali literature, the *mahabhuta* ("great elements") or *catudhatu* ("four elements") are earth, water, fire and air. In early Buddhism, the four elements are a basis for understanding suffering and for liberating oneself from suffering. The earliest Buddhist texts explain that the four primary material elements are the sensory qualities solidity, fluidity, temperature, and mobility; their characterization as earth, water, fire, and air, respectively, is declared an abstraction—instead of concentrating on the fact of material existence, one observes how a physical thing is sensed, felt, perceived.

The Buddha's teaching regarding the four elements is to be understood as the base of all observation of real sensations rather than as a philosophy. The four properties are cohesion (water), solidity or inertia (earth), expansion or vibration (air) and heat or energy content (fire). He promulgated a categorization of mind and matter as composed of eight types of "kalapas" of which the four elements are primary and a secondary group of four are color, smell, taste, and nutriment which are derivative from the four primaries.

The Buddha's teaching of the four elements does predate Greek teaching of the same four elements. This is possibly explained by the fact that he sent out 60 arahants to the known world to spread his teaching; however it differs in the fact that the Buddha taught that the four elements are false and that form is in fact made up of much smaller particles which are constantly changing.

Thanissaro Bhikkhu (1997) renders an extract of Shakyamuni Buddha's from Pali into English thus:

Just as a skilled butcher or his apprentice, having killed a cow, would sit at a crossroads cutting it up into pieces, the monk contemplates this very body -- however it stands, however it is disposed -- in terms of properties: 'In this body there is the earth property, the liquid property, the fire property, & the wind property.'

Seven chakras

In the philosophy of the seven chakras there are correspondences to the five elements as shared by both Hinduism and Buddhism as well as two other elements:

- Sahasrara (Crown): Thought/Space
- Ajña (Third Eye): Light/Dark
- Vishuddhi (Throat): Ether/Sound
- Anahata (Heart): Air
- Manipura (Navel): Fire
- Svadhisthana (Sacral): Water
- Muladhara (Root): Earth

Bön elements

In Bön or ancient Tibetan philosophy, the five elemental processes of earth, water, fire, air and space are the essential materials of all existent phenomena or aggregates. The elemental processes form the basis of the calendar, astrology, medicine, psychology and are the foundation of the spiritual traditions of shamanism, tantra and Dzogchen.

Tenzin Wangyal Rinpoche states that

physical properties are assigned to the elements: earth is solidity; water is cohesion; fire is temperature; air is motion; and space is the spatial dimension that accommodates the other four active elements. In addition, the elements are correlated to different emotions, temperaments, directions, colors, tastes, body types, illnesses, thinking styles, and character. From the five elements arise the five senses and the five fields of sensual experience; the five negative emotions and the five wisdoms; and the five extensions of the body. They are the five primary *pranas* or vital energies. They are the constituents of every physical, sensual, mental, and
spiritual phenomenon.\[6\]

The names of the elements are analogous to categorised experiential sensations of the natural world. The names are symbolic and key to their inherent qualities and/or modes of action by analogy. In Bön the elemental processes are fundamental metaphors for working with external, internal and secret energetic forces. All five elemental processes in their essential purity are inherent in the mindstream and link the trikaya and are aspects of primordial energy. As Herbert V. Günther states:

Thus, bearing in mind that thought struggles incessantly against the treachery of language and that what we observe and describe is the observer himself [sic.], we may nonetheless proceed to investigate the successive phases in our becoming human beings. Throughout these phases, the experience (das Erlebnis) of ourselves as an intensity (imaged and felt as a "god", lha) setting up its own spatiality (imaged and felt as a "house" khang) is present in various intensities of illumination that occur within ourselves as a "temple." A corollary of this Erlebnis is its light character manifesting itself in various "frequencies" or colors. This is to say, since we are beings of light we display this light in a multiplicity of nuances.[7]

In the above block quote the trikaya is encoded as: dharmakaya "god"; sambhogakaya "temple" and nirmanakaya "house".

**Chinese elements**

The Chinese had a somewhat different series of elements, namely Fire, Earth, Water, Metal and Wood, which were understood as different types of energy in a state of constant interaction and flux with one another, rather than the Western notion of different kinds of material.

Although it is usually translated as "element", the Chinese word xìng literally means something like "changing states of being", "permutations" or "metamorphoses of being".\[8\] In fact Sinologists cannot agree on one single translation. The Chinese conception of "element" is therefore quite different from the Western one. The Western elements were seen as the basic building blocks of matter. The Chinese, by contrast, were seen as ever changing and moving forces or energies—one translation of wú xìng is simply "the five changes".

The Wu Xìng are chiefly an ancient mnemonic device for systems with five stages; hence the preferred translation of "movements", "phases" or "steps" over "elements."

In Taoism there is a similar system of elements, which includes metal and wood, but excludes air, which is replaced with qì, which is a force or energy rather than an element. In Chinese philosophy the universe consists of heaven and earth, heaven being made of qi and earth being made of the five elements (in the Chinese view, the attributes and properties of the Western and Indian Air element are equivalent to that of Wood, where the element of Ether is often seen as a correspondent to Metal). The five major planets are associated with and named after the elements: Venus 金星 is Metal 金, Jupiter 木星 is Wood 木, Mercury 水星 is Water 水, Mars 火星 is Fire 火, and Saturn 土星 is Earth 土. Additionally, the Moon represents Yin 陰, and the Sun 太陽 represents Yang 陽. Yin, Yang, and the five elements are recurring themes in the I Ching, the oldest of Chinese classical texts which describes an ancient system of cosmology and philosophy. The five elements also play an important part in Chinese astrology and the Chinese form of geomancy known as Feng shui

The doctrine of five phases describes two cycles of balance, a generating or creation (生, shēng) cycle and an overcoming or destruction (克/剋, kè) cycle of interactions between the phases.

**Generating**

- Wood feeds fire;
- Fire creates earth (ash);
- Earth bears metal;
- Metal collects water;
- Water nourishes wood.
Overcoming

- Wood parts earth;
- Earth absorbs water;
- Water quenches fire;
- Fire melts metal;
- Metal chops wood.

There are also two cycles of imbalance, an overacting cycle (cheng) and an insulting cycle (wu).

Japanese elements

Japanese traditions use a set of elements called the 五大 (go dai, literally "five great"). These five are earth, water, fire, wind/air, and void. These came from Buddhist beliefs; the classical Chinese elements (五行, go gyô) are also prominent in Japanese culture, especially to the influential Neo-Confucianists during the Edo period.

- **Earth** represented things that were solid.
- **Water** represented things that were liquid.
- **Fire** represented things that destroyed.
- **Air** represented things that moved.
- **Heaven** represented things not of our everyday life.

Elements in Medieval alchemy

The elemental system used in Medieval alchemy was developed by the Arabic alchemist, Jābir ibn Hayyān and others. His original system consisted of the four classical elements found in the ancient Greek traditions (air, earth, fire and water), in addition to two philosophical elements: sulphur, 'the stone which burns', which characterized the principle of combustibility, and mercury, which contained the idealized principle of metallic properties. The three metallic principles: sulphur to flammability or combustion, mercury to volatility and stability, and salt to solidity. became the tri prima of the Swiss alchemist Paracelsus, who reasoned that Aristotle's four element theory appeared in bodies as three principles. Paracelsus saw these principles as fundamental, and justified them by recourse to the description of how wood burns in fire. Mercury included the cohesive principle, so that when it left in smoke the wood fell apart. Smoke described the volatility (the mercury principle), the heat-giving flames described flammability (sulphur), and the remnant ash described solidity (salt).

Modern elements

The Aristotelian tradition and medieval Alchemy eventually gave rise to modern scientific theories and new taxonomies. By the time of Antoine Lavoisier, for example, a list of elements would no longer refer to classical elements. The classical elements correspond more closely to four states of matter: solid, liquid, gas, and plasma.

Modern science recognizes classes of elementary particles which have no substructure, (or rather, particles that aren't made of other particles), and composite particles having substructure, (particles made of other particles). The Standard Model of quantum mechanics defines three classes of elementary subatomic particles: quarks and leptons, (matter-like particles),
and gauge bosons (energy-like force carriers). Quarks are divided into six types: up, down, top, bottom, strange and charm; and leptons are similarly divided into six types: electron, electron neutrino, muon, muon neutrino, tau and tau neutrino. The types of force carriers include: photon, W and Z boson, gluon and some quantification of a Higgs boson.

Elements in western astrology and tarot

Western astrology uses the four classical elements in connection with astrological charts and horoscopes. The twelve signs of the zodiac are divided into the four elements: Fire signs are Aries, Leo and Sagittarius, Earth signs are Taurus, Virgo and Capricorn, Air signs are Gemini, Libra and Aquarius, and Water signs are Cancer, Scorpio, and Pisces.

In divinatory tarot, the suits of cups, swords, batons/wands, and discs/coins are said to correspond to water, air, fire, and earth respectively.

References

General information


Footnotes


External links

• Section on 4 elements in Buddhism [http://www.accesstoinsight.org/lib/authors/khin/wheel231.html]
Ionian School (philosophy)

The **Ionian school**, a type of Greek philosophy centred in Miletus, Ionia in the 6th and 5th centuries BCE, is something of a misnomer. Although Ionia was a centre of Western philosophy, the scholars it produced, including Thales, Anaximander, Anaximenes, Heraclitus, Anaxagoras, Archelaus, and Diogenes of Apollonia, had such diverse viewpoints that it cannot be said to be a specific school of philosophy. Aristotle called them *physiologoi* meaning 'those who discoursed on nature', but he did not group them together as an "Ionian school". The classification can be traced to the 2nd century historian of philosophy Sotion. They are sometimes referred to as cosmologists, since they were largely physicalists who tried to explain the nature of matter.

While some of these scholars are included in the Milesian school of philosophy, others are more difficult to categorize.

Most cosmologists thought that although matter can change from one form to another, all matter has something in common which does not change. They did not agree what it was that all things had in common, and did not experiment to find out, but used abstract reasoning rather than religion or mythology to explain themselves, thus becoming the first philosophers in the Western tradition.

Later philosophers widened their studies to include other areas of thought. The Eleatic school, for example, also studied epistemology, or how people come to know what exists. But the Ionians were the first group of philosophers that we know of, and so remain historically important.

**Thales**

Thales (Greek: Θαλῆς) of Miletus (ca. 624 BCE - 546 BCE) is regarded as the earliest western philosopher. Before Thales, the Greeks explained the origin and nature of the world through myths of anthropomorphic gods and heroes. Phenomena like lightning or earthquakes were attributed to actions of the gods. By contrast, Thales attempted to find naturalistic explanations of the world, without reference to the supernatural. He explained earthquakes by imagining that the Earth floats on water, and that earthquakes occur when the Earth is rocked by waves. Thales' most famous belief was his cosmological doctrine, which held that the world originated from water.
Anaximander

Anaximander (Greek: Ἀναξιμάνδρος) (610 BCE – ca. 546 BCE) wrote a cosmological work, little of which remains. From the few extant fragments, we learn that he believed the beginning or first principle (arche, a word first found in Anaximander's writings, and which he probably invented) is an endless, unlimited mass (apeiron), subject to neither old age nor decay, which perpetually yields fresh materials from which everything we can perceive is derived.

Anaximenes

Anaximenes (Greek: Ἀναξιμένης) of Miletus (585 BCE - 528 BCE) held that the air, with its variety of contents, its universal presence, its vague associations in popular fancy with the phenomena of life and growth, is the source of all that exists. Everything is air at different degrees of density, and under the influence of heat, which expands, and of cold, which contracts its volume, it gives rise to the several phases of existence. The process is gradual, and takes place in two directions, as heat or cold predominates. In this way was formed a broad disk of earth, floating on the circumambient air. Similar condensations produced the sun and stars; and the flaming state of these bodies is due to the velocity of their motions.

Heraclitus

Heraclitus (Greek: Ἡράκλειτος) of Ephesus (ca. 535 - 475 BCE) disagreed with Thales, Anaximander, and Pythagoras about the nature of the ultimate substance and claimed instead that everything is derived from the Greek classical element fire, rather than from air, water, or earth. This led to the belief that change is real, and stability illusory. For Heraclitus "Everything flows, nothing stands still." He is also famous for saying: "No man can cross the same river twice, because neither the man nor the river are the same."

Empedocles

Empedocles (ca. 490 BCE – ca. 430 BCE) was a citizen of Agrigentum, a Greek colony in Sicily. Empedocles' philosophy is best known for being the origin of the cosmogenic theory of the four classical elements. He maintained that all matter is made up of four elements: water, earth, air and fire. Empedocles postulated forces called Love (philia) and Strife (neikos) to explain the attraction and separation of different forms of matter. He was also one of the first people to state the theory that light travels at a finite (although very large) speed.

Anaxagoras

Anaxagoras of Clazomenae (ca. 500-428 BCE) regarded material substance as an infinite multitude of imperishable primary elements, referring all generation and disappearance to mixture and separation respectively. All substance is ordered by an ordering force, the cosmic mind (nous).

Archelaus

Archelaus was a Greek philosopher of the 5th century BCE, born probably in Athens. He was a pupil of Anaxagoras, and is said by Ion of Chios (Diogenes Laërtius, ii. 23) to have been the teacher of Socrates. Some argue that this is probably only an attempt to connect Socrates with the Ionian School; others (e.g. Gomperz, Greek Thinkers) uphold the story. There is similar difference of opinion as regards the statement that Archelaus formulated certain ethical doctrines. In general, he followed Anaxagoras, but in his cosmology he went back to the earlier Ionians.
Hippo

Hippo (ca. 425 BCE) was native of Magna Graecia (Italy). Very little is known about him. He held that water was the principle of all things, with fire springing from water, and then developing itself by generating the universe. Primarily interested in biological matters, he was said to have been an atheist.

Diogenes of Apollonia

Diogenes (ca. 425 BCE) was a native of Apollonia, either the one in Crete or in Thrace. Like Anaximenes, he believed air to be the one source of all being, and all other substances to be derived from it by condensation and rarefaction. His chief advance upon the doctrines of Anaximenes is that he asserted air, the primal force, to be possessed of intelligence—"the air which stirred within him not only prompted, but instructed. The air as the origin of all things is necessarily an eternal, imperishable substance, but as soul it is also necessarily endowed with consciousness."

Notes


External links

• Catholic Encyclopedia Entry (http://www.newadvent.org/cathen/08092a.htm)

References

• @ This article incorporates text from a publication now in the public domain: Chisholm, Hugh, ed (1911). *Encyclopaedia Britannica* (Eleventh ed.). Cambridge University Press.
Paired opposites

Paired opposites are an ancient, pre-Socratic method of establishing thesis, antithesis and synthesis in terms of a standard for what is right and proper in natural philosophy.

Relative absolutes

From the very beginnings absolutes are named as gods and paired opposites taken as consorts light and darkness are associated with relative absolutes such as air as air, earth, fire and water, whose noun based relational synthesis gives birth to new ranges of adjective and adverbial qualitative paired opposites.

Where for example, power and wisdom give birth to justice, we have a qualitative rather than strictly scalar synthesis. Paired adjectives and adverbs implying a change in state toward for example wetness or dryness are further expanded through their relative absolutes to be conditional or dependent on a process of becoming or changing towards a well ordered balance.

Going back to the Egyptian concept of Ma'at[1] and the Pythagoreans[2] there is an idea that what is beautiful and pleasing should be proportionate to a standard and with the Greeks the expansion on that idea that the more general and formulaic the standards the better. This idea that there should be beauty and elegance evidenced by a skillful composition of well understood elements underlies mathematics in general and in a sense all the modulors of design as well. The idea is that what makes proportions pleasing to humans in categories such as the architecture of buildings music, art, and mathematical proofs is their being scaled down to dimensions humans can relate to and scaled up through distances humans can travel as a procession of revelations which may sometimes invoke closure, or glimpses of views that go beyond any encompassing framework and thus suggest to the observer that there is something more besides, invoking wonder and awe.

The classical standards are a series of paired opposites designed to expand the dimensional constraints of the harmony and proportion. In the Greek ideal Vitruvius addresses they are similarity, difference, motion, rest, number, sequence and consequence.

These are incorporated in good architectural design as philosophical categorization; what similarity is of the essence that makes it what it is, and what difference is it that makes it not something else? Is the size of a column or an arch related just to the structural load it bears or more broadly to the presence and purpose of the space itself?

The standard of motion originally referred to encompassing change but has now been expanded to buildings whose kinetic mechanisms may actually determine change depend upon harmonies of wind, humidity, temperature, sound, light, time of day or night, and previous cycles of change.
The stability of the architectural standard of the universal set of proportions references the totality of the built environment so that even as it changes it does so in an ongoing and continuous process that can be measured, weighed, and judged as to its orderly harmony.

Sacred geometry has the same arrangement of elements found in compositions of music and nature at its finest incorporating light and shadow, sound and silence, texture and smoothness, mass and airy lightness, as in a forest glade where the leaves move gently on the wind or a sparkle of metal catches the eye as a ripple of water on a pond.

**Paired opposites in the proportions of units**

Scalar ranges and coordinate systems are paired opposites within sets. Incorporating dimensions of positive and negative numbers and exponents, or expanding $x,y$ and $z$ coordinates, by adding a fourth dimension of time allows a resolution of position relative to the standard of the scale which is often taken as $0,0,0,0$ with additional dimensions added as referential scales are expanded from space and time to mass and energy.

Ancient systems frequently scaled their degree of opposition by rate of increase or rate of decrease. Linear increase was enhanced by doubling systems. An acceleration in the rate of increase or decrease could be analyzed arithmetically, geometrically, or through a wide range of other numerical and physical analysis. Arithmetic and geometric series, and other methods of rating proportionate expansion or contraction could be thought of as convergent or divergent toward a position.

Though unit quantities were first defined by spatial dimensions, and then expanded by adding coordinates of time, the weight or mass a given spatial dimension could contain was also considered and even in antiquity, conditions under which the standard would be established such as at a given temperature, distance from sea level, or density were added.

Rates of change over time were then considered as either indexes of production or depletion

**Paired opposites in rates of increase and decrease**

The concept of balance vs chaos can be thought of as particle vs wave. The particle minimizes change even when in motion. The wave accentuates change by increasing or decreasing. Relative change may result in one dimension increasing as another decreases or one rate of change increasing as another decreases.

**Law and order**

As the natural order of things gives rise to consensus as to what is right and proper and what is by contrast wrong, evil, or bad; societally, mathematically, philosophically and scientifically it becomes necessary to establish standards and orders of magnitude by which something may be evaluated as in or out of tolerance

**References**

Paired opposites


**Footnotes**

Material monism

Material monism is a Presocratic belief which provides an explanation of the physical world by saying that all of the world's objects are composed of a single element. Among the material monists were the three Milesian philosophers: Thales, who believed that everything was composed of water; Anaximander, who believed it was apeiron; and Anaximenes, who believed it was air.

Although their ideas seem farfetched, these philosophers were the first to give an explanation of the physical world without referencing the supernatural; this opened the way for all modern science (and philosophy), which has the same goal of explaining the world without dependence on the supernatural.

Some modern theorists, such as Albert Einstein, have searched for a theory that explains the world as the product of a single substance, but at a deeper level, one that is beneath the structure of atoms and even quarks.

Diogenes Laërtius

Diogenes Laërtius (ancient Greek: Διογένης Λαέρτιος, Diogenes Laertios; fl. c. 3rd century) was a biographer of the Greek philosophers. Nothing is known about his life, but his surviving Lives and Opinions of Eminent Philosophers is one of the principal surviving sources for the history of Greek philosophy.

Life

Nothing is definitively known about his life. He must have lived after Sextus Empiricus (c. 200 AD), whom he mentions, and before Stephanus of Byzantium and Sopater (c. 500 AD), who quote him. His work makes no mention of Neoplatonism, even though it is addressed to a woman who was "an enthusiastic Platonist."[1] It is probable that he flourished in the first half of the third century, during the reign of Alexander Severus (222–235) and his successors.

The precise form of his name is uncertain. In the ancient manuscripts of his work, he is invariably referred to as "Laertius Diogenes," and this form of the name is repeated by Sopater,[2] and the Suda.[3] The modern form "Diogenes Laertius" is much rarer, and occurs in Stephanus of Byzantium,[4] and in a lemma to the Greek Anthology.[5] He is also referred to as "Laertes,"[6] or just "Diogenes."[7]

The origin of his name "Laertius" is equally uncertain. Stephanus of Byzantium, in one passage, refers to him as "Diogenes of Laertius,"[8] implying that he was the native of some town, perhaps the Laerte in Caria, or the one in Cilicia. An alternative suggestion is that one of his ancestors had for a patron a member of the Roman family of the Laërtii.[9] The modern theory is that "Laertius" is a nickname, to distinguish him from the many other people called Diogenes in the ancient world, and derived from the Homeric epithet "Diogenes Laertiade," used in addressing Odysseus.[10]

His home town is unknown, assuming that his name does not refer to his place of origin. A disputed passage in his writings[11] has been used to suggest that it was Nicaea in Bithynia.[12]

Writings

The work by which he is known, Lives and Opinions of Eminent Philosophers, was written in Greek and professes to give an account of the lives and sayings of the Greek philosophers. Although it is at best an uncritical and unphilosophical compilation, its value, as giving us an insight into the private lives of the Greek sages, led Montaigne to exclaim that he wished that instead of one Laërtius there had been a dozen.[13] On the other hand, modern scholars advise that we treat Diogenes' testimonia with care, especially when he fails to cite his sources: "Diogenes has acquired an importance out of all proportion to his merits because the loss of many primary sources
and of the earlier secondary compilations has accidentally left him the chief continuous source for the history of Greek philosophy.\[14\]

Diogenes treats his subject in two divisions which he describes as the Ionian and the Italian schools; the division is somewhat dubious and appears to be drawn from the lost doxography of Sotion. The biographies of the former begin with Anaximander, and end with Clitomachus, Theophrastus and Chrysippus; the latter begins with Pythagoras, and ends with Epicurus. The Socratic school, with its various branches, is classed with the Ionic; while the Eleatics and sceptics are treated under the Italic. From the statements of Walter Burley (a 14th-century monk) in his De vita et moribus philosophorum the text of Diogenes seems to have been much fuller than that which we now possess.

His own opinions are uncertain. It has been suggested that Diogenes was an Epicurean, or a Skeptic. In favour of the view that he was an Epicurean, is the fact that he passionately defends Epicurus.\[15\] Book 10, which discusses Epicurus, is of high quality, and contains three long letters, written by Epicurus, which explain Epicurean doctrines.\[16\] In favour of the view that he was a Skeptic, is the way in which he is impartial to all the schools in the manner of the ancient skeptics, and he carries the succession of the school further than the other schools. At one point, he even seems to refer to the Skeptics as "our school."\[11\] On the other hand, most of these points can be explained by the way he uncritically copies from his sources. It is impossible to be certain that he adhered to any school, and he is usually more interested in biographical details than in philosophical doctrines.\[17\]

In addition to the Lives, Diogenes was the author of a work in verse on famous men, in various metres.

Notes

[1] Diogenes Laërtius, iii. 47
[4] Stephanus of Byzantium, Druidai
[5] Lemma to Anthologia Palatina, vii. 95
[7] Stephanus of Byzantium, Eneto
[8] Stephanus of Byzantium, Cholleidai
[11] Diogenes Laërtius, ix. 109. Specifically, Diogenes refers to "our Apollonides of Nicaea," this is conjectured to mean either "my fellow-citizen" or "a Skeptic like myself."
[15] Diogenes Laërtius, x. 3-12
[16] Diogenes Laërtius, x. 34-135

Works

Bibliography


External links

- Diogenes Laërtius, Lives of the Eminent Philosophers, translated by Robert Drew Hicks (1925), Loeb Classical Library.
- Diogenes Laërtius, Lives and Opinions of Eminent Philosophers (http://classicpersuasion.org/pw/diogenes/), translated by Charles Duke Yonge (1853) (Uses a different method of enumerating the sections from the modern editions.)
- Ancient Greek text of Diogenes' Lives (http://www.mikrosapoplous.gr/dl/dl.html)
- Article on the Manuscript versions (http://www.tertullian.org/rpearse/manuscripts/diogenes_laertius.htm) at the Tertullian Project

Lives and Opinions of Eminent Philosophers

*Lives and Opinions of Eminent Philosophers* (Greek: Βίοι καὶ γνώμαι τῶν ἐν φιλοσοφίᾳ εὐδοκιμησάντων) is a biography of the Greek philosophers by Diogenes Laërtius, written in Greek, perhaps in the first half of the third century AD.

Overview

The *Lives and Opinions of Eminent Philosophers*, was written in Greek and professes to give an account of the lives and sayings of the Greek philosophers. The work doesn't have an exact title in the manuscripts and appears in various lengthy forms.

Although it is at best an uncritical and unphilosophical compilation, its value, as giving us an insight into the private lives of the Greek sages, led Montaigne to write that he wished that instead of one Laërtius there had been a dozen.[1] On the other hand, modern scholars have advised that we treat Diogenes' testimonia with care, especially when he fails to cite his sources: "Diogenes has acquired an importance out of all proportion to his merits because the loss of many primary sources and of the earlier secondary compilations has accidentally left him the chief continuous source for the history of Greek philosophy."[2]
Organization of the work

Laërtius treats his subject in two divisions which he describes as the Ionian and the Italian schools. The biographies of the former begin with Anaximander, and end with Clitomachus, Theophrastus and Chrysippus; the latter begins with Pythagoras, and ends with Epicurus. The Socratic school, with its various branches, is classed with the Ionic; while the Eleatics and sceptics are treated under the Italic. He also includes his own poetic verse, albeit pedestrian, about the philosophers he discusses.

### Books 1-7: Ionian Philosophy

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<tr>
<th>Book 1: The Seven Sages</th>
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<tr>
<td>Thales, Solon, Chilon, Pittacus, Bias, Cleobulus, Periander, Anacharsis, Myson, Epimenides, Pherecydes</td>
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<th>Book 2: Socrates, with predecessors and followers</th>
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<tr>
<td>Anaximander, Anaximenes, Anaxagoras, Archelaus, Socrates, Xenophon, Aeschines, Aristippus, Phaedo, Euclides, Stilpo, Crito, Simon, Glauccon, Simmias, Cebes, Menedemus of Eretia</td>
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<th>Book 4: The Academy</th>
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<td>Speusippus, Xenocrates, Polemo, Crates of Athens, Crantor, Arcesilaus, Bion, Lacydes, Carneades, Clitomachus</td>
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<th>Book 5: The Peripatetics</th>
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<th>Book 7: The Stoics</th>
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### Books 8-10: Italian Philosophy

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<th>Book 8: Pythagoreans</th>
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<th>Book 9: Uncategorized (Eleatics, Atomists, Skeptics, etc.)</th>
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<td>Heraclitus, Xenophanes, Parmenides, Melissus, Zeno of Elea, Leucippus, Democritus, Protagoras, Diogenes of Apollonia, Anaxarchus, Pyrrho, Timon</td>
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<th>Book 10: Epicurus</th>
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The work contains incidental remarks on many other philosophers, and there are useful accounts concerning Hegesias, Anniceris, and Theodorus (Cyrenaics);\[3\] Persaeus (Stoic);\[4\] and Metrodorus and Hermarchus ( Epicureans).\[5\] Book VII is incomplete and breaks off during the life of Chrysippus. From a table of contents in one of the manuscripts (manuscript P), this book is known to have continued with Zeno of Tarsus, Diogenes, Apollodorus, Boethus, Mnesarchides, Mnasagoras, Nestor, Basilides, Dardanus, Antipater, Heraclides, Sosigenes, Panaetius, Hecato, Posidonius, Athenodorus, another Athenodorus, Antipater, Arius, and Cornutus. The whole of Book X is devoted to Epicurus, and contains three long letters written by Epicurus, which explain Epicurean doctrines.

His chief authorities were Favorinus and Diocles of Magnesia, but his work also draws (either directly or indirectly) on books by Antisthenes of Rhodes, Alexander Polyhistor, and Demetrius of Magnesia, as well as works by Hippobotus, Aristippus, Panaetius, Apollodorus, Sosicrates, Satyrus, Sotion, Neanthes, Hermippus, Antigonus,
Heraclides, Hieronymus, and Pamphila. From the statements of the pseudo-Burlaeus, in the 14th-century work *De vita et moribus philosophorum*, the text of Diogenes seems to have been much fuller than that which we now possess.

**Manuscript editions**

There are many extant manuscripts of the *Lives*, although none of them are especially old, and they all descend from a common ancestor, because they all lack the end of Book VII. The three most useful manuscripts are known as B, P, and F. Manuscript B (*Codex Borbonicus*) dates from the 12th century, and is in the National Library of Naples. Manuscript P (Paris) and manuscript F (Florence) are probably a little younger.

There seem to have been some early Latin translations, which have no longer survived. A 10th century work entitled *Tractatus de dictis philosophorum* shows some knowledge of Diogenes. Henry Aristippus, in the 12th century, is known to have translated at least some of the work into Latin, and in the 14th century an unknown author made use of a Latin translation for his *De vita et moribus philosophorum* (attributed erroneously to Walter Burley).

**Printed editions**

The first printed editions were Latin translations. The first was by Ambrogio Traversari, and made before 1432. The Greek text of the lives of Aristotle and Theophrastus appeared in the third volume of the Aldine Aristotle in 1497. The first edition of the whole Greek text was that published by Hieronymus Froben in 1533. The first critical edition of the entire text, by H.S. Long in the Oxford Classical Texts, was not produced until 1964. This edition was superseded by Miroslav Marcovich's Teubner edition, published between 1999 and 2002. A new edition, by Tiziano Dorandi, is to be published by Cambridge University Press (see T. Dorandi, *Laertiana* Berlin, Walter de Gruyter 2009).

**English translations**

There have been three English translations of the complete *Lives*. The first was a late 17th-century translation by ten different persons. A better translation was made by Charles Duke Yonge (1853), but although this was more literal, it still contained many inaccuracies. The translation by Robert Drew Hicks (1925) for the Loeb Classical Library remains the definitive translation, although it is slightly bowdlerized.
Notes

[3] Diogenes Laërtius, ii. 93-104
[5] Diogenes Laërtius, x. 22-26

External links

- Article on the Manuscript versions (http://www.tertullian.org/rpearse/manuscripts/diogenes_laertius.htm) at the Tertullian Project
The Milesians

Milesian school

The Milesian school was a school of thought founded in the 6th Century BC. The ideas associated with it are exemplified by three philosophers from the Ionian town of Miletus, on the Aegean coast of Anatolia: Thales, Anaximander, and Anaximenes. They introduced new opinions contrary to the prevailing viewpoint on how the world was organized, in which natural phenomena were explained solely by the will of anthropomorphized gods. The Milesians presented a view of nature in terms of methodologically observable entities, and as such was one of the first truly scientific philosophies.

Note: It is important to make a distinction between the Milesian school and the Ionian, which includes the philosophies of both the Milesians and other distinctly different Ionian thinkers such as Heraclitus. See also Pre-Socratic philosophy.

Philosophy of nature

These philosophers defined all things by their quintessential substance (which Aristotle, perhaps being anachronistic, called the αρχή / arche of which the world was formed and which was the source of everything. Thales thought it to be water. But as it was impossible to explain some things (such as fire) as being composed of this element, Anaximander chose an unobserved, undefined element, which he called apeiron (ἀπειρόν=having no limit). He reasoned that if each of the four traditional elements (water, air, fire, and earth) are opposed to the other three, and if they cancel each other out on contact, none of them could constitute a stable, truly elementary form of matter. Consequently, there must be another entity from which the others originate, and which must truly be the most basic element of all. The notion of temporal infinity was familiar to the Greek mind in the religious conception of immortality and Anaximander's description was in terms appropriate to this conception. This arche is called "eternal and ageless" (Hippolitus I,6,1;DK B2). The unspecified nature of the apeiron upset critics, which caused Anaximenes to define it as being air, a more concrete, yet still subtle, element. Anaximenes held that by its evaporation and condensation, air can change into other elements or substances such as fire, wind, clouds, water, and earth. However, our modern concept of energy is much more similar to Anaximander's apeiron.

Cosmology

The differences between the three philosophers was not limited to the nature of matter. Each of them conceived of the universe differently. Thales held that the Earth was floating in water. Anaximander placed the Earth at the center of a universe composed of hollow, concentric wheels filled with fire, and pierced by holes at various intervals, which appeared as the sun, the moon, and the other stars. For Anaximenes, the sun and the moon were flat disks traveling around a heavenly canopy, on which the stars were fixed.
Milesian school

Bibliography


References

Thales of Miletus (Θαλῆς ὁ Μιλήσιος)

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Thales of Miletus (pronounced /ˈθeɪliːs/; Greek: Θαλῆς, Thalēs; c. 624 BC – c. 546 BC) was a pre-Socratic Greek philosopher from Miletus in Asia Minor, and one of the Seven Sages of Greece. Many, most notably Aristotle, regard him as the first philosopher in the Greek tradition. According to Bertrand Russell, "Western philosophy begins with Thales.” Thales attempted to explain natural phenomena without reference to mythology and was tremendously influential in this respect. Almost all of the other pre-Socratic philosophers follow him in attempting to provide an explanation of ultimate substance, change, and the existence of the world—without reference to mythology. Those philosophers were also influential, and eventually Thales' rejection of mythological explanations became an essential idea for the scientific revolution. He was also the first to define general principles and set forth hypotheses, and as a result has been dubbed the "Father of Science", though it is argued that Democritus is actually more deserving of this title.

In mathematics, Thales used geometry to solve problems such as calculating the height of pyramids and the distance of ships from the shore. He is credited with the first use of deductive reasoning applied to geometry, by deriving four corollaries to Thales' Theorem. As a result, he has been hailed as the first true mathematician and is the first known individual to whom a mathematical discovery has been attributed.
Life

Thales lived around the mid 620s – mid 540s BC and was born in the city of Miletus. Miletus was an ancient Greek Ionian city on the western coast of Asia Minor (in what is today the Aydin Province of Turkey), near the mouth of the Maeander River.

Background

The dates of Thales' life are not known precisely. The time of his life is roughly established by a few dateable events mentioned in the sources and an estimate of his length of life. According to Herodotus, Thales once predicted a solar eclipse which has been determined by modern methods to have been on May 28, 585 BC. Diogenes Laërtius quotes the chronicle of Apollodorus as saying that Thales died at 78 in the 58th Olympiad (548–545), and Sosicrates as reporting that he was 90 at his death.

As mentioned, according to tradition, Thales was born in Miletus, Asia Minor. Diogenes Laërtius states that ("according to Herodotus and Douris and Democritus") his parents were Examyes and Cleobuline, Phoenician nobles. Giving another opinion, he ultimately connects Thales' family line back to Phoenician prince Cadmus. Diogenes also reports two other stories, one that he married and had a son, Cybisthus or Cybisithon, or adopted his nephew of the same name. The second is that he never married, telling his mother as a young man that it was too early to marry, and as an older man that it was too late. A much earlier source - Plutarch - tells the following story: Solon who visited Thales asked him the reason which kept him single. Thales answered that he did not like the idea of having to worry about children. Nevertheless, several years later Thales, anxious for family, adopted his nephew Cybisthus.

Thales involved himself in many activities, taking the role of an innovator. Some say that he left no writings, others that he wrote "On the Solstice" and "On the Equinox". Neither has survived. Diogenes Laërtius quotes letters of Thales to Pherecydes and Solon, offering to review the book of the former on religion, and offering to keep company with the latter on his sojourn from Athens. Thales identifies the Milesians as Athenians.

Business

Several anecdotes suggest that Thales was not solely a thinker; he was involved in business and politics. One story recounts that he bought all the olive presses in Miletus after predicting the weather and a good harvest for a particular year. Another version of this same story states that he bought options for the use of the presses not to become wealthy, but merely to demonstrate to his fellow Milesians that he could use his intelligence to enrich himself. This can be considered the first known example of options trading.

Politics

Thales' political life had mainly to do with the involvement of the Ionians in the defense of Anatolia against the growing power of the Persians, who were then new to the region. A king had come to power in neighboring Lydia, Croesus, who was somewhat too aggressive for the size of his army. He had conquered most of the states of coastal Anatolia, including the cities of the Ionians. The story is told in Herodotus.
The Lydians were at war with the Medes, a remnant of the first wave of Persians in the region, over the issue of refuge the Lydians had given to some Scythian soldiers of fortune inimical to the Medes. The war endured for five years, but in the sixth an eclipse of the Sun (mentioned above) spontaneously halted a battle in progress (the Battle of Halys).

It seems that Thales had predicted this solar eclipse. The Seven Sages were most likely already in existence, as Croesus was also heavily influenced by Solon of Athens, another sage. Whether Thales was present at the battle is not known, nor are the exact terms of the prediction, but based on it the Lydians and Medes made peace immediately, swearing a blood oath.

The Medes were dependencies of the Persians under Cyrus. Croesus now sided with the Medes against the Persians and marched in the direction of Iran (with far fewer men than he needed). He was stopped by the river Halys, then unbridged. This time he had Thales with him, perhaps by invitation. Whatever his status, the king gave the problem to him, and he got the army across by digging a diversion upstream so as to reduce the flow, making it possible to ford the river. The channels ran around both sides of the camp.

The two armies engaged at Pteria in Cappadocia. As the battle was indecisive but paralyzing to both sides, Croesus marched home, dismissed his mercenaries and sent emissaries to his dependents and allies to ask them to dispatch fresh troops to Sardis. The issue became more pressing when the Persian army showed up at Sardis. Diogenes Laertius[10] tells us that Thales gained fame as a counsellor when he advised the Milesians not to engage in a symmachia, a “fighting together”, with the Lydians. This has sometimes been interpreted as an alliance, but a ruler does not ally with his subjects.

Croesus was defeated before the city of Sardis by Cyrus, who subsequently spared Miletus because it had taken no action. Cyrus was so impressed by Croesus’ wisdom and his connection with the sages that he spared him and took his advice on various matters.

The Ionians were now free. Herodotus says that Thales advised them to form an Ionian state; that is, a bouleuterion (“deliberative body”) to be located at Teos in the center of Ionia. The Ionian cities should be demoi, or “districts”. Miletus, however, received favorable terms from Cyrus. The others remained in an Ionian League of 12 cities (excluding Miletus now), and were subjugated by the Persians.

Sagacity

Diogenes Laertius[11] tells us that the Seven Sages were created in the archonship of Damasius at Athens about 582 BC and that Thales was the first sage. The same story, however, asserts that Thales emigrated to Miletus. There is also a report that he did not become a student of nature until after his political career. Much as we would like to have a date on the seven sages, we must reject these stories and the tempting date if we are to believe that Thales was a native of Miletus, predicted the eclipse, and was with Croesus in the campaign against Cyrus.

Thales had instruction from Egyptian priests, we are told. It was fairly certain that he came from a wealthy and established family, and the
wealthy customarily educated their children. Moreover, the ordinary citizen, unless he was a seafaring man or a merchant, could not afford the grand tour in Egypt, and in any case did not consort with noble lawmakers such as Solon.

He did participate in some games, most likely Panhellenic, at which he won a bowl twice. He dedicated it to Apollo at Delphi. As he was not known to have been athletic, his event was probably declamation, and it may have been victory in some specific phase of this event that led to his being designated sage.

**Theories**

The Greeks often invoked idiosyncratic explanations of natural phenomena by reference to the will of anthropomorphic gods and heroes. Thales, however, aimed to explain natural phenomena via a rational explanation that referenced natural processes themselves. For example, Thales attempted to explain earthquakes by hypothesizing that the Earth floats on water, and that earthquakes occur when the Earth is rocked by waves, rather than assuming that earthquakes were the result of supernatural processes. Thales was a Hylozoist (those who think matter is alive). It is unclear whether the interpretation that he treated matter as being alive might have been mistaken for his thinking the properties of nature arise directly from material processes, more consistent with modern ideas of how properties arise as emergent characteristics of complex systems involved in the processes of evolution and developmental change.

Thales, according to Aristotle, asked what was the nature (Greek *Arche*) of the object so that it would behave in its characteristic way. *Physis* (ψυχη) comes from *phyein* (φυειν), "to grow", related to our word "be". *(G)natura is the way a thing is "born", again with the stamp of what it is in itself.* Aristotle characterizes most of the philosophers "at first" (πρῶτον) as thinking that the "principles in the form of matter were the only principles of all things", where "principle" is arche, "matter" is hyle ("wood" or "matter", "material") and "form" is eidos.

*Arche* is translated as "principle", but the two words do not have precisely the same meaning. A principle of something is merely prior (related to pro-) to it either chronologically or logically. An arche (from αρχειν, "to rule") dominates an object in some way. If the arche is taken to be an origin, then specific causality is implied; that is, B is supposed to be characteristically B just because it comes from A, which dominates it.

The archai that Aristotle had in mind in his well-known passage on the first Greek scientists are not necessarily chronologically prior to their objects, but are constituents of it. For example, in pluralism objects are composed of earth, air, fire and water, but those elements do not disappear with the production of the object. They remain as archai within it, as do the atoms of the atomists.

What Aristotle is really saying is that the first philosophers were trying to define the substance(s) of which all material objects are composed. As a matter of fact, that is exactly what modern scientists are attempting to accomplish in nuclear physics, which is a second reason why Thales is described as the first western scientist.

**Water as a first principle**

Thales' most famous belief was his cosmological thesis, which held that the world started from water. Aristotle considered this belief roughly equivalent to the later ideas of Anaximenes, who held that everything in the world was composed of air.

The best explanation of Thales' view is the following passage from Aristotle's *Metaphysics.* The passage contains words from the theory of matter and form that were adopted by science with quite different meanings.

"That from which is everything that exists and from which it first becomes and into which it is rendered at last, its substance remaining under it, but transforming in qualities, that they say is the element and principle of things that are."

And again:
"For it is necessary that there be some nature (φύσις), either one or more than one, from which become the other things of the object being saved... Thales the founder of this type of philosophy says that it is water."[17]

Aristotle's depiction of the problem of change and the definition of substance is clear. If an object changes, is it the same or different? In either case how can there be a change from one to the other? The answer is that the substance "is saved", but acquires or loses different qualities (πάθη, the things you "experience").

A deeper dip into the waters of the theory of matter and form is properly reserved to other articles. The question for this article is, how far does Aristotle reflect Thales? He was probably not far off, and Thales was probably an incipient matter-and-formist.

The essentially non-philosophic Diogenes Laertius states that Thales taught as follows:

"Water constituted (ὑπεστήσατο, 'stood under') the principle of all things."[18]

Heraclitus Homericus[19] states that Thales drew his conclusion from seeing moist substance turn into air, slime and earth. It seems likely that Thales viewed the Earth as solidifying from the water on which it floated and which surrounded Ocean.[citation needed]

Beliefs in divinity

Thales applied his method to objects that changed to become other objects, such as water into earth (he thought). But what about the changing itself? Thales did address the topic, approaching it through lodestone and amber, which, when electrified by rubbing together, also attracts. A concern for magnetism and electrification never left science, being a major part of it today. Even the subatomic particle of electric current is derived from the Greek word ἥλεκτρον (ēlektron), which means "amber".

How was the power to move other things without the movers changing to be explained? Thales saw a commonality with the powers of living things to act. The lodestone and the amber must be alive, and if that were so, there could be no difference between the living and the dead. When asked why he didn't die if there was no difference, he replied "because there is no difference."

Aristotle defined the soul as the principle of life, that which imbues the matter and makes it live, giving it the animation, or power to act. The idea did not originate with him, as the Greeks in general believed in the distinction between mind and matter, which was ultimately to lead to a distinction not only between body and soul but also between matter and energy.

If things were alive, they must have souls. This belief was no innovation, as the ordinary ancient populations of the Mediterranean did believe that natural actions were caused by divinities. Accordingly, the sources say that Thales believed that "all things were full of gods."[20] In their zeal to make him the first in everything some said he was the first to hold the belief, which must have been widely known to be false.

However, Thales was looking for something more general, a universal substance of mind. That also was in the polytheism of the times. Zeus was the very personification of supreme mind, dominating all the subordinate manifestations. From Thales on, however, philosophers had a tendency to depersonify or objectify mind, as though it were the substance of animation per se and not actually a god like the other gods. The end result was a total removal of mind from substance, opening the door to a non-divine principle of action. This tradition persisted until Einstein, whose cosmology is quite a different one and does not distinguish between matter and energy.

Classical thought, however, had proceeded only a little way along that path. Instead of referring to the person, Zeus, they talked about the great mind:

"Thales", says Cicero,[21] "assures that water is the principle of all things; and that God is that Mind which shaped and created all things from water."

The universal mind appears as a Roman belief in Virgil as well:

"In the beginning, SPIRIT within (spiritus intus) strengthens Heaven and Earth,"
Thales was known for his innovative use of geometry. His understanding was theoretical as well as practical. For example, he said:

Megiston topos: hapanta gar chorei (Μέγιστον τόπος· άπαντα γαρ χωρεί)

"Space is the greatest thing, as it contains all things"

Topos is in Newtonian-style space, since the verb, chorei, has the connotation of yielding before things, or spreading out to make room for them, which is . Within this extension, things have a position. Points, lines, planes and solids related by distances and angles follow from this presumption.

Thales understood similar triangles and right triangles, and what is more, used that knowledge in practical ways. The story is told in DL (loc. cit.) that he measured the height of the pyramids by their shadows at the moment when his own shadow was equal to his height. A right triangle with two equal legs is a 45-degree right triangle, all of which are similar. The length of the pyramid's shadow measured from the center of the pyramid at that moment must have been equal to its height.

This story indicates that he was familiar with the Egyptian seked, or seqed - the ratio of the run to the rise of a slope (cotangent). The seked is at the base of problems 56, 57, 58, 59 and 60 of the Rhind papyrus - an ancient Egyptian mathematics document.

Our cotangents require the same units for run and rise, but the papyrus uses cubits for rise and palms for run, resulting in different (but still characteristic) numbers. Since there were 7 palms in a cubit, the seked was 7 times the cotangent.

To use an example often quoted in modern reference works, suppose the base of a pyramid is 140 cubits and the angle of rise 5.25 seked. The Egyptians expressed their fractions as the sum of fractions, but the decimals are sufficient for the example.

What is the rise in cubits? The run is 70 cubits, 490 palms. X, the rise, is 490 divided by 5.25 or 93 1/3 cubits. These figures sufficed for the Egyptians and Thales. We would go on to calculate the cotangent as 70 divided by 93 1/3 to get 3/4 or .75 and looking that up in a table of cotangents find that the angle of rise is a few minutes over 53 degrees.

Whether the ability to use the seked, which preceded Thales by about 1000 years, means that he was the first to define trigonometry is a matter of opinion. More practically Thales used the same method to measure the
distances of ships at sea, said Eudemus as reported by Proclus ("in Euclidem"). According to Kirk & Raven (reference cited below), all you need for this feat is three straight sticks pinned at one end and knowledge of your altitude. One stick goes vertically into the ground. A second is made level. With the third you sight the ship and calculate the seked from the height of the stick and its distance from the point of insertion to the line of sight.

The seked is a measure of the angle. Knowledge of two angles (the seked and a right angle) and an enclosed leg (the altitude) allows you to determine by similar triangles the second leg, which is the distance. Thales probably had his own equipment rigged and recorded his own sekeds, but that is only a guess.

Thales' Theorem is stated in another article. (Actually there are two theorems called Theorem of Thales, one having to do with a triangle inscribed in a circle and having the circle's diameter as one leg, the other theorem being also called the intercept theorem.) In addition Eudemus attributed to him the discovery that a circle is bisected by its diameter, that the base angles of an isosceles triangle are equal and that vertical angles are equal. It would be hard to imagine civilization without these theorems.

It is possible, of course, to question whether Thales really did discover these principles. On the other hand, it is not possible to answer such doubts definitively. The sources are all that we have, even though they sometimes contradict each other.

(The most we can say is that Thales knew these principles. There is no evidence for Thales discovering these principles, and, based on the evidence, we cannot say that Thales discovered these principles.)

Interpretations

In the long sojourn of philosophy there has existed hardly a philosopher or historian of philosophy who did not mention Thales and try to characterize him in some way. He is generally recognized as having brought something new to human thought. Mathematics, astronomy and medicine already existed. Thales added something to these different collections of knowledge to produce a universality, which, as far as writing tells us, was not in tradition before, but resulted in a new field.

Ever since, interested persons have been asking what that new something is. Answers fall into (at least) two categories, the theory and the method. Once an answer has been arrived at, the next logical step is to ask how Thales compares to other philosophers, which leads to his classification (rightly or wrongly).

Theory

The most natural epithets of Thales are "materialist" and "naturalist", which are based on ousia and physis. The Catholic Encyclopedia goes so far as to call him a physiologist, a person who studied physis, despite the fact that we already have physiologists. On the other hand, he would have qualified as an early physicist, as did Aristotle. They studied corpora, "bodies", the medieval descendants of substances.

Most agree that Thales' stamp on thought is the unity of substance, hence Bertrand Russell: [23]

"The view that all matter is one is quite a reputable scientific hypothesis."

"...But it is still a handsome feat to have discovered that a substance remains the same in different states of aggregation."

Russell was only reflecting an established tradition; for example: Nietzsche, in his Philosophy in the Tragic Age of the Greeks, wrote: [24]

"Greek philosophy seems to begin with an absurd notion, with the proposition that water is the primal origin and the womb of all things. Is it really necessary for us to take serious notice of this proposition? It is, and for three reasons. First, because it tells us something about the primal origin of all things; second, because it does so in language devoid of image or fable, and finally, because contained in it, if only embryonically, is the thought, 'all things are one.'"
This sort of materialism, however, should not be confused with deterministic materialism. Thales was only trying to explain the unity observed in the free play of the qualities. The arrival of uncertainty in the modern world made possible a return to Thales; for example, John Elof Boodin writes (“God and Creation”):

"We cannot read the universe from the past..."

Boodin defines an "emergent" materialism, in which the objects of sense emerge uncertainly from the substrate. Thales is the innovator of this sort of materialism.

**The Rise of Theoretical Inquiry**

In the West, Thales represents a new kind of inquiring community as well. Edmund Husserl\[^{25}\] attempts to capture the new movement as follows. Philosophical man is a "new cultural configuration" based in stepping back from "pregiven tradition" and taking up a rational "inquiry into what is true in itself;" that is, an ideal of truth. It begins with isolated individuals such as Thales, but they are supported and cooperated with as time goes on. Finally the ideal transforms the norms of society, leaping across national borders.

**Classification**

The term "Pre-Socratic" derives ultimately from the philosopher Aristotle, who distinguished the early philosophers as concerning themselves with substance.

Diogenes Laertius on the other hand took a strictly geographic and ethnic approach. Philosophers were either Ionian or Italian. He used "Ionian" in a broader sense, including also the Athenian academics, who were not Pre-Socratics. From a philosophic point of view, any grouping at all would have been just as effective. There is no basis for an Ionian or Italian unity. Some scholars, however, concede to Diogenes' scheme as far as referring to an "Ionian" school. There was no such school in any sense.

The most popular approach refers to a Milesian school, which is more justifiable socially and philosophically. They sought for the substance of phenomena and may have studied with each other. Some ancient writers qualify them as Milesioi, "of Miletus."

**Influence on others**
Thales had a profound influence on other Greek thinkers and therefore on Western history. Some believe Anaximander was a pupil of Thales. Early sources report that one of Anaximander's more famous pupils, Pythagoras, visited Thales as a young man, and that Thales advised him to travel to Egypt to further his philosophical and mathematical studies.

Many philosophers followed Thales' lead in searching for explanations in nature rather than in the supernatural; others returned to supernatural explanations, but couched them in the language of philosophy rather than of myth or of religion.

Looking specifically at Thales' influence during the pre-Socratic era, it is clear that he stood out as one of the first thinkers who thought more in the way of logos than mythos. The difference between these two more profound ways of seeing the world is that mythos is concentrated around the stories of holy origin, while logos is concentrated around the argumentation. When the mythical man wants to explain the world the way he sees it, he explains it based on gods and powers. Mythical thought does not differentiate between things and persons and furthermore it does not differentiate between nature and culture. The way a logos thinker would present a world view is radically different from the way of the mythical thinker. In its concrete form, logos is a way of thinking not only about individualism, but also the abstract. Furthermore, it focuses on sensible and continuous argumentation. This lays the foundation of philosophy and its way of explaining the world in terms of abstract argumentation, and not in the way of gods and mythical stories.

Sources

Our sources on the Milesian philosophers (Thales, Anaximander, and Anaximenes) were either roughly contemporaneous (such as Herodotus) or lived within a few hundred years of his passing. Moreover, they were writing from a tradition that was well-known. Most modern dissension comes from trying to interpret what we know, in particular, distinguishing legend from fact.

The main secondary source concerning the details of Thales' life and career is Diogenes Laertius, "Lives of Eminent Philosophers".[26] This is primarily a biographical work, as the name indicates. Compared to Aristotle, Diogenes is not much of a philosopher. He is the one who, in the Prologue to that work, is responsible for the division of the early philosophers into "Ionian" and "Italian", but he places the Academics in the Ionian school and otherwise evidences considerable disarray and contradiction, especially in the long section on forerunners of the "Ionian School". Diogenes quotes two letters attributed to Thales, but Diogenes wrote some eight centuries after Thales' death and that his sources often contained "unreliable or even fabricated information",[27] hence the concern for separating fact from legend in accounts of Thales.

Most philosophic analyses of the philosophy of Thales come from Aristotle, a professional philosopher, tutor of Alexander the Great, who wrote 200 years after Thales death. Aristotle, judging from his surviving books, does not seem to have access to any works by Thales, although he probably had access to works of other authors about Thales, such as Herodotus, Hecataeus, Plato etc, as well as others whose work is now extinct. It was Aristotle's express goal to present Thales work not because it was significant in itself, but as a prelude to his own work in natural philosophy.[28] Geoffrey Kirk and John Raven, English compilers of the fragments of the Pre-Socratics, assert that Aristotle's "judgments are often distorted by his view of earlier philosophy as a stumbling progress toward the truth that Aristotle himself revealed in his physical doctrines."[29] There was also an extensive oral tradition.
Both the oral and the written were commonly read or known by all educated men in the region.

Aristotle's philosophy had a distinct stamp: it professed the theory of matter and form, which modern scholastics have dubbed hylomorphism. Though once very widespread, it was not generally adopted by rationalist and modern science, as it mainly is useful in metaphysical analyses, but does not lend itself to the detail that is of interest to modern science. It is not clear that the theory of matter and form existed as early as Thales, and if it did, whether Thales espoused it.

Notes

[6] Herodotus, 1.74.2 (http://www.perseus.tufts.edu/cgi-bin/ptext?lookup=Hdt.+1.74.1), and A. D. Godley's footnote 1; Pliny, 2.9 (12) (http://www.perseus.tufts.edu/cgi-bin/ptext?lookup=Plin.+Nat.+2.9) and Bostock's footnote 2.
[7] Diogenes Laërtius, 1.43, 44.
[9] Book 1
[10] 1.25
[13] English physics (http://www.bartleby.com/61/77/P0277700.html) comes from it, but the latter is a Greek loan. In addition the quite ancient native English word be (http://www.bartleby.com/61/roots/IE62.html) comes from the same Indo-European root.
[16] 983 b6 8-11
[17] Lines 17-21 with gaps.
[19] Quaes. Hom. 22, not the same as Heraclitus of Ephesus
[21] De natura Deorum, i.,10
[23] Wisdom of the West
[24] § 3 
[25] The Vienna Lecture

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**Further reading**

• Morse, Sidney H.; Marvin, Joseph B., *The Radical* (http://books.google.com/books?id=kIAQAAAIAAAJ&pg=PA170&lpg=PA170&dq=thales+sound+mind+in+sound+body&source=bl&ots=73ll9ErYW3&sig=Bdpml5rYncGWPeq8y1AqYoSRy7c#PPA170,M1), A. Williams & Co., 1868. Cf. p. 170 and on.

**External links**

• Thales of Miletus from The Internet Encyclopedia of Philosophy (http://www.iep.utm.edu/t/thales.htm)

• Thales of Miletus (http://www-groups.dcs.st-and.ac.uk/~history/Mathematicians/Thales.html) from the MacTutor History of Mathematics archive

• Livius (http://www.livius.org), Thales of Miletus (http://www.livius.org/th/thales/thales.html) by Jona Lendering

• Thales (http://www.philosophy.gr/presocratics/thales.htm)


• Thales biography by Charlene Douglass (http://www.mathopenref.com/thales.html) With extensive bibliography.
### Anaximander (Ἀναξίμανδρος)

Anaximander (Ancient Greek: Ἀναξίμανδρος, Anaximandros) (c. 610 BC – c. 546 BC) was a pre-Socratic Greek philosopher who lived in Miletus, a city of Ionia; Milet in modern Turkey. He belonged to the Milesian school and learned the teachings of his master Thales. He succeeded Thales and became the second master of that school where he counted Anaximenes and Pythagoras amongst his pupils.

Little of his life and work is known today. According to available historical documents, he is the first philosopher known to have written down his studies, although only one fragment of his work remains. Fragmentary testimonies found in documents after his death provide a portrait of the man.

Anaximander was one of the earliest Greek thinkers at the start of the Axial Age, the period from approximately 700 BC to 200 BC, during which similarly revolutionary thinking appeared in China, India, Iran, the Near East, and Ancient Greece. He was an early proponent of science and tried to observe and explain different aspects of the universe, with a particular interest in its origins, claiming that nature is ruled by laws, just like human societies, and anything that disturbs the balance of nature does not last long. Like many thinkers of his time, Anaximander’s contributions to philosophy relate to many disciplines. In astronomy, he tried to describe the mechanics of celestial bodies in relation to the Earth. In physics, his postulation that the indefinite (or apeiron) was the source of all things led Greek philosophy to a new level of conceptual abstraction. His knowledge of geometry allowed him to introduce the gnomon in Greece. He created a map of the world that contributed greatly to the advancement of geography. He was also involved in the politics of Miletus and was sent as a leader to one of its colonies.

Anaximander claimed that an ‘indefinite’ (apeiron) principle gives rise to all natural phenomena. Carl Sagan claims that he conducted the earliest recorded scientific experiment.

<table>
<thead>
<tr>
<th>Full name</th>
<th>Anaximander (Ἀναξίμανδρος)</th>
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<tbody>
<tr>
<td>Born</td>
<td>c. 610 BC</td>
</tr>
<tr>
<td>Died</td>
<td>c. 546 BC (aged around 64)</td>
</tr>
<tr>
<td>Era</td>
<td>Pre-Socratic philosophy</td>
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<tr>
<td>Region</td>
<td>Western Philosophy</td>
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<td>School</td>
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<tr>
<td>Main interests</td>
<td>Metaphysics, astronomy, geometry, geography</td>
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<tr>
<td>Notable ideas</td>
<td>The apeiron is the first principle</td>
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</table>

Detail of Raphael's painting *The School of Athens*, 1510–1511. This could be a representation of Anaximander leaning towards Pythagoras on his left.
Biography

Anaximander, son of Praxiades, was born in Miletus during the third year of the 42nd Olympiad (610 BC),\[^{[5]}\]
According to Apollodorus, Greek grammarian of the 2nd century BC, he was sixty-four years old during the second year of the 58th Olympiad (547-546 BC), and died shortly afterwards.\[^{[6]}\]

Establishing a timeline of his work is now impossible, since no document provides chronological references. Themistius, a 4th century Byzantine rhetorician, mentions that he was the "first of the known Greeks to publish a written document on nature." Therefore his texts would be amongst the earliest written in prose, at least in the Western world. By the time of Plato, his philosophy was almost forgotten, and Aristotle, his successor Theophrastus and a few doxographers provide us with the little information that remains. However, we know from Aristotle that Thales, also from Miletus, precedes Anaximander. It is debatable whether Thales actually was the teacher of Anaximander, but there is no doubt that Anaximander was influenced by Thales' theory that everything is derived from water. One thing that is not debatable is that even the ancient Greeks considered Anaximander to be from the Monist school which began in Miletus with Thales followed by Anaximander and finished with Anaximenes.\[^{[7]}\] 3rd century Roman rhetorician Aelian depicts him as leader of the Milesian colony to Apollonia on the Black Sea coast, and hence some have inferred that he was a prominent citizen. Indeed, Various History (III, 17) explains that philosophers sometimes also dealt with political matters. It is very likely that leaders of Miletus sent him there as a legislator to create a constitution or simply to maintain the colony’s allegiance.

Theories

Anaximander's theories were influenced by the Greek mythical tradition, and by some ideas of Thales – the father of philosophy – as well as by observations made by older civilizations in the East (especially by the Babylonian astrologists).\[^{[8]}\] All these were elaborated rationally. In his desire to find some universal principle, he assumed like traditional religion the existence of a cosmic order and in elaborating his ideas on this he used the old mythical language which ascribed divine control to various spheres of reality. This was a common practice for the Greek philosophers in a society which saw gods everywhere, therefore they could fit their ideas into a tolerably elastic system.\[^{[9]}\]

Some scholars saw a gap between the existing mythical and the new rational way of thought which is the main characteristic of the archaic period (8th to 6th century BC) in the Greek city states. Because of this, they didn't hesitate to speak for a 'Greek miracle'. But if we follow carefully the course of Anaximander's ideas, we will notice that there was not such an abrupt break as initially appears. The basic elements of nature (water, air, fire, earth) which the first Greek philosophers believed that constituted the universe represent in fact the primordial forces of previous thought. Their collision produced what the mythical tradition had called cosmic harmony. In the old cosmogonies – Hesiod (8th-7th century BC) and Pherecydes (6th century BC) – Zeus establishes his order in the world by destroying the powers which were threatening this harmony, (the Titans). Anaximander claimed that the cosmic order is not monarchic but geometric and this causes the equilibrium of the earth which is lying in the centre of the universe. This is the projection on nature of a new political order and a new space organized around a centre which is the static point of the system in the society as in nature.\[^{[10]}\] In this space there is isonomy (equal rights) and all the forces are symmetrical and transferrable. The decisions are now taken by the assembly of demos in the agora which is lying in the middle of the city.\[^{[11]}\]

The same rational way of thought led him to introduce the abstract apeiron (indefinite, infinite, boundless, unlimited\[^{[12]}\]) as an origin of the universe, a concept that is probably influenced by the original Chaos (gaping void, abyss, formless state) of the mythical Greek cosmogony from which everything else appeared.\[^{[13]}\] It also takes notice of the mutual changes between the four elements. Origin, then, must be something else unlimited in its source, that could create without experiencing decay, so that genesis would never stop.\[^{[14]}\]
Anaximander

The bishop Hippolytus of Rome (I, 5), and the later 6th century Byzantine philosopher Simplicius of Cilicia, attribute to Anaximander the earliest use of the word *apeíron* (ἄπειρον infinite or limitless) to designate the original principle. He was the first philosopher to employ, in a philosophical context, the term *arkhé* (ἀρχή), which until then had meant *beginning* or *origin*. For him, it became no longer a mere point in time, but a source that could perpetually give birth to whatever will be. The indefiniteness is spatial in early usages as in Homer (indefinite sea) and as in Xenophanes (6th century BC) who said that the earth went down indefinitely (to *apeiron*) i.e. beyond the imagination or concept of men.[15]

Aristotle writes (*Metaphysics*, I III 3-4) that the Pre-Socratics were searching for the *element* that constitutes all things. While each pre-Socratic philosopher gave a different answer as to the identity of this element (water for Thales and air for Anaximenes), Anaximander understood the beginning or first principle to be an endless, unlimited primordial mass (*apeiron*), subject to neither old age nor decay, that perpetually yielded fresh materials from which everything we perceive is derived.[16] He proposed the theory of the *apeiron* in direct response to the earlier theory of his teacher, Thales, who had claimed that the primary substance was water. The notion of temporal infinity was familiar to the Greek mind from remote antiquity in the religious concept of immortality and Anaximander’s description was in terms appropriate to this conception. This *arche* is called "eternal and ageless". (Hippolitus I,6,1;DK B2)[17]

For Anaximander, the principle of things, the constituent of all substances, is nothing determined and not an element such as water in Thales' view. Neither is it something halfway between air and water, or between air and fire, thicker than air and fire, or more subtle than water and earth.[18] Anaximander argues that water cannot embrace all of the opposites found in nature — for example, water can only be wet, never dry — and therefore cannot be the one primary substance; nor could any of the other candidates. He postulated the *apeiron* as a substance that, although not directly perceptible to us, could explain the opposites he saw around him.

Anaximander explains how the four elements of ancient physics (air, earth, water and fire) are formed, and how Earth and terrestrial beings are formed through their interactions. Unlike other Pre-Socratics, he never defines this principle precisely, and it has generally been understood (e.g., by Aristotle and by Saint Augustine) as a sort of primal chaos. According to him, the Universe originates in the separation of opposites in the primordial matter. It embraces the opposites of hot and cold, wet and dry, and directs the movement of things; an entire host of shapes and differences then grow that are found in "all the worlds" (for he believed there were many).

Anaximander maintains that all dying things are returning to the element from which they came (*apeiron*). The one surviving fragment of Anaximander's writing deals with this matter. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements:[19]

> Whence things have their origin,
> Thence also their destruction happens,
> According to necessity;
> For they give to each other justice and recompense
> For their injustice
> In conformity with the ordinance of Time.

Simplicius mentions that Anaximander said all these "in poetic terms", meaning that he used the old mythical language. The goddess Justice (Dike) keeps the cosmic order. This concept of returning to the element of origin was often revisited afterwards, notably by Aristotle,[20] and by the Greek tragedian Euripides: "what comes from earth must return to earth."[21] Friedrich Nietzsche, in his *Philosophy in the Tragic Age of the Greeks*, stated that Anaximander viewed "...all coming-to-be as though it were an illegitimate emancipation from eternal being, a wrong for which destruction is the only penance."[22]
Anaximander was the first to conceive a mechanical model of the world. In his model, the Earth floats very still in the centre of the infinite, not supported by anything. It remains "in the same place because of its indifference", a point of view that Aristotle considered ingenious, but false, in On the Heavens. Its curious shape is that of a cylinder with a height one-third of its diameter. The flat top forms the inhabited world, which is surrounded by a circular oceanic mass. Such a model allowed the concept that celestial bodies could pass under it. It goes further than Thales' claim of a world floating on water, for which Thales faced the problem of explaining what would contain this ocean, while Anaximander solved it by introducing his concept of infinite (apeiron).

At the origin, after the separation of hot and cold, a ball of flame appeared that surrounded Earth like bark on a tree. This ball broke apart to form the rest of the Universe. It resembled a system of hollow concentric wheels, filled with fire, with the rims pierced by holes like those of a flute. Consequently, the Sun was the fire that one could see through a hole the same size as the Earth on the farthest wheel, and an eclipse corresponded with the occlusion of that hole. The diameter of the solar wheel was twenty-seven times that of the Earth (or twenty-eight, depending on the sources) and the lunar wheel, whose fire was less intense, eighteen (or nineteen) times. Its hole could change shape, thus explaining lunar phases. The stars and the planets, located closer, followed the same model.
Anaximander was the first astronomer to consider the Sun as a huge mass, and consequently, to realize how far from Earth it might be, and the first to present a system where the celestial bodies turned at different distances. Furthermore, according to Diogenes Laertius (II, 2), he built a celestial sphere. This invention undoubtedly made him the first to realize the obliquity of the Zodiac as the Roman philosopher Pliny the Elder reports in Natural History (II, 8). It is a little early to use the term ecliptic, but his knowledge and work on astronomy confirm that he must have observed the inclination of the celestial sphere in relation to the plane of the Earth to explain the seasons. The doxographer and theologian Aetius attributes to Pythagoras the exact measurement of the obliquity.

Multiple worlds
According to Simplicius, Anaximander already speculated on the plurality of worlds, similar to atomists Leucippus and Democritus, and later philosopher Epicurus. These thinkers supposed that worlds appeared and disappeared for a while, and that some were born when others perished. They claimed that this movement was eternal, "for without movement, there can be no generation, no destruction".[29]

In addition to Simplicius, Hippolytus[30] reports Anaximander's claim that from the infinite comes the principle of beings, which themselves come from the heavens and the worlds (several doxographers use the plural when this philosopher is referring to the worlds within,[31] which are often infinite in quantity). Cicero writes that he attributes different gods to the countless worlds.[32]

This theory places Anaximander close to the Atomists and the Epicureans who, more than a century later, also claimed that an infinity of worlds appeared and disappeared. In the timeline of the Greek history of thought, some thinkers conceptualized a single world (Plato, Aristotle, Anaxagoras and Archelaus), while others instead speculated on the existence of a series of worlds, continuous or non-continuous (Anaximenes, Heraclitus, Empedocles and Diogenes).

Meteorological phenomena
Anaximander attributed some phenomena, such as thunder and lightning, to the intervention of elements, rather than to divine causes.[33] In his system, thunder results from the shock of clouds hitting each other; the loudness of the sound is proportionate with that of the shock. Thunder without lightning is the result of the wind being too weak to emit any flame, but strong enough to produce a sound. A flash of lightning without thunder is a jolt of the air that disperses and falls, allowing a less active fire to break free. Thunderbolts are the result of a thicker and more violent air flow.[34]

He saw the sea as a remnant of the mass of humidity that once surrounded Earth.[35] A part of that mass evaporated under the sun's action, thus causing the winds and even the rotation of the celestial bodies, which he believed were attracted to places where water is more abundant.[36] He explained rain as a product of the humidity pumped up from Earth by the sun.[5] For him, the Earth was slowly drying up and water only remained in the deepest regions, which someday would go dry as well. According to Aristotle's Meteorology (II, 3), Democritus also shared this opinion.

Origin of humankind
Anaximander speculated about the beginnings and origin of animal life. Taking into account the existence of fossils, he claimed that animals sprang out of the sea long ago. The first animals were born trapped in a spiny bark, but as they got older, the bark would dry up and break.[37] As the early humidity evaporated, dry land emerged and, in time, humankind had to adapt. The 3rd century Roman writer Censorinus reports:

Anaximander of Miletus considered that from warmed up water and earth emerged either fish or entirely fishlike animals. Inside these animals, men took form and embryos were held prisoners until puberty; only then, after these animals burst open, could men and women come out, now able to feed themselves.[38]
Anaximander put forward the idea that humans had to spend part of this transition inside the mouths of big fish to protect themselves from the Earth's climate until they could come out in open air and lose their scales. He thought that, considering humans' extended infancy, we could not have survived in the primeval world in the same manner we do presently.

Even though he had no theory of natural selection, some people consider him as evolution's most ancient proponent. The theory of an aquatic descent of man was re-conceived centuries later as the aquatic ape hypothesis. These pre-Darwinian concepts may seem strange, considering modern knowledge and scientific methods, because they present complete explanations of the universe while using bold and hard-to-demonstrate hypotheses. However, they illustrate the beginning of a phenomenon sometimes called the "Greek miracle": men try to explain the nature of the world, not with the aid of myths or religion, but with material principles. This is the very principle of scientific thought, which was later advanced further by improved research methods.

Other accomplishments

Cartography

Both Strabo and Agathemerus (later Greek geographers) claim that, according to the geographer Eratosthenes, Anaximander was the first to publish a map of the world. The map probably inspired the Greek historian Hecataeus of Miletus to draw a more accurate version. Strabo viewed both as the first geographers after Homer.

Maps were produced in ancient times, also notably in Egypt, Lydia, the Middle East, and Babylon. Only some small examples survived until today. The unique example of a world map comes from late Babylonian tablet BM 92687 later than 9th century BCE but is based probably on a much older map. These maps indicated directions, roads, towns, borders, and geological features. Anaximander's innovation was to represent the entire inhabited land known to the ancient Greeks.

Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. First, it could be used to improve navigation and trade between Miletus's colonies and other colonies around the Mediterranean Sea and Black Sea. Second, Thales would probably have found it easier to convince the Ionian city-states to join in a federation in order to push the Median threat away if he possessed such a tool. Finally, the philosophical idea of a global representation of the world simply for the sake of knowledge was reason enough to design one.

Surely aware of the sea's convexity, he may have designed his map on a slightly rounded metal surface. The centre or "navel" of the world (ὀμφαλός γῆς omphalós gêς) could have been Delphi, but is more likely in Anaximander's time to have been located near Miletus. The Aegean Sea was near the map's centre and enclosed by three continents, themselves located in the middle of the ocean and isolated like islands by sea and rivers. Europe was bordered on the south by the Mediterranean Sea and was separated from Asia by the Black Sea, the Lake Maeotis, and, further east,
either by the Phasis River (now called the Rioni) or the Tanais. The Nile flowed south into the ocean, separating Libya (which was the name for the part of the then-known African continent) from Asia.

**Gnomon**

The *Suda* relates that Anaximander explained some basic notions of geometry. It also mentions his interest in the measurement of time and associates him with the introduction in Greece of the gnomon. In Lacedaemon, he participated in the construction, or at least in the adjustment, of sundials to indicate solstices and equinoxes. Indeed, a gnomon required adjustments from a place to another because of the difference in latitude.

In his time, the gnomon was simply a vertical pillar or rod mounted on a horizontal plane. The position of its shadow on the plane indicated the time of day. As it moves through its apparent course, the sun draws a curve with the tip of the projected shadow, which is shortest at noon, when pointing due south. The variation in the tip's position at noon indicates the solar time and the seasons; the shadow is longest on the winter solstice and shortest on the summer solstice.

However, the invention of the gnomon itself cannot be attributed to Anaximander because its use, as well as the division of days into twelve parts, came from the Babylonians. It is they, according to Herodotus' *Histories* (II, 109), who gave the Greeks the art of time measurement. It is likely that he was not the first to determine the solstices, because no calculation is necessary. On the other hand, equinoxes do not correspond to the middle point between the positions during solstices, as the Babylonians thought. As the *Suda* seems to suggest, it is very likely that with his knowledge of geometry, he became the first Greek to accurately determine the equinoxes.

**Prediction of an earthquake**

In his philosophical work *De Divinatione* (I, 50, 112), Cicero states that Anaximander convinced the inhabitants of Lacedaemon to abandon their city and spend the night in the country with their weapons because an earthquake was near. The city collapsed when the top of the Taygetus split like the stern of a ship. Pliny the Elder also mentions this anecdote (II, 81), suggesting that it came from an "admirable inspiration", as opposed to Cicero, who did not associate the prediction with divination.

**Interpretations**

Bertrand Russell in the *History of Western Philosophy* interprets Anaximander's theories as an assertion of the necessity of an appropriate balance between earth, fire, and water, all of which may be independently seeking to aggrandize their proportions relative to the others. Anaximander seems to express his belief that a natural order ensures balance between these elements, that where there was fire, ashes (earth) now exist. His Greek peers echoed this sentiment with their belief in natural boundaries beyond which not even their gods could operate.

Friedrich Nietzsche, in *Philosophy in the Tragic Age of the Greeks*, claimed that Anaximander was a pessimist who asserted that the primal being of the world was a state of indefiniteness. In accordance with this, anything definite has to eventually pass back into indefiniteness. In other words, Anaximander viewed "...all coming-to-be as though it were an illegitimate emancipation from eternal being, a wrong for which destruction is the only penance". (Ibid., § 4)

The world of individual objects, in this way of thinking, has no worth and should perish.

Martin Heidegger lectured extensively on Anaximander, and delivered a lecture entitled "Anaximander's Saying" which was subsequently included in *Off the Beaten Track*. The lecture examines the ontological difference and the oblivion of Being or *Dasein* in the context of the Anaximander fragment. Heidegger's lecture is, in turn, an important influence on the French philosopher Jacques Derrida.
Works

According to the Suda:[48]

- On Nature (Περὶ φύσεως / Perì phíseôn)
- Around the Earth (Γῆς περίοδος / Gês períodos)
- On Fixed Bodies (Περὶ τῶν ἀπλανῶν / Perì tôn aplanôn)
- The Sphere (Σφαῖρα / Sphaĩra)

Footnotes

[1] This character is traditionally associated with Boethius, however his face offering similarities with a bust of Anaximander, it could be a representation of the philosopher. See http://www.mlahanas.de/Greeks/SchoolAthens2.htm for a description of the characters in this painting.


[5] Hippolytus, Refutation of All Heresies (I, 5)

[6] In his Chronicles, as reported by Diogenes Laërtius, Lives and Opinions of Eminent Philosophers (II, 2).

[7] Richard D. McKirahan, Philosophy before Socrates, Ch 5, 32-34


[13] Aetios, I 3 3 (Pseudo-Plutchar; DK 12 A 14); Aristotle, Phys. Γ5.204b 23sq. [DK 12 A 16.]


[18] Simplicius, Comments on Aristotle's Physics (24, 13):

"Ἀναξίμανδρος [...] λέγει δ' αὐτὴν μήτε ὕδωρ μήτε ἄλλο τῶν καλουμένων εἶναι στοιχείων, ἀλλ’ ἐτέραν τινὰ φύσιν ἀπείρων ἄλλην τινὰ εἶναι στοιχείων, κατὰ τὴν τούτων κατά τὴν τοῦ ἁπάντων ὁ�ντος τῆς φθορᾶς." Punctuation does not exist in Ancient Greek and quotes usually blend with surrounding text. Consequently, deciding where they start and where they end is often difficult. However, it is generally accepted that this quote is not Simplicius’ own interpretation, but Anaximander's writing, in "somewhat poetic terms" as it is mentioned by Simplicius,

[19] Aristotle, Metaphysics, I, 3, 983 b 8-11; Physics, III, 5, 204 b 33-34

[20] Euripides,Supplices, v. 532


[22] Pseudo-Plutchar, Doctrines of the philosophers, i. 7


[24] Aetius, De Fide (III, 7, 1), or "similar to a pillar-shaped stone", pseudo-Plutchar (III, 10).

[25] In Refutation, Hippolytus reports that the circle of the Sun is twenty-seven times bigger than the Moon.

[26] Aetius, De Fide (II, 15, 6)
Most of Anaximander's model of the Universe comes from pseudo-Plutarch (II, 20-28):

"[The Sun] is a circle twenty-eight times as big as the Earth, with the outline similar to that of a fire-filled chariot wheel, on which appears a mouth in certain places and through which it exposes its fire, as through the hole on a flute. [...] the Sun is equal to the Earth, but the circle on which it breathes and on which it's born is twenty-seven times as big as the whole earth. [...] [The eclipse] is when the mouth from which comes the fire heat is closed. [...] [The Moon] is a circle nineteen times as big as the whole earth, all filled with fire, like that of the Sun".

Simplicius, Commentary on Aristotle's Physics, 1121, 5-9
Hippolytus, Refutation I, 6
Notably pseudo-Plutarch (III, 2) and Aetius, (I, 3; 3; I, 7; 12; II, 1, 3; II, 1, 8).

On the Nature of the Gods (I, 10, 25):

"Anaximandri autem opinio est nativos esse deos longis intervallis orientis occidentisque, eosque innumerables esse mundos."

"For Anaximander, gods were born, but the time is long between their birth and their death; and the worlds are countless."

Pseudo-Plutarch (III, 3):

"Anaximander claims that all this is done by the wind, for when it happens to be enclosed in a thick cloud, then by its subtlety and lightness, the rupture produces the sound; and the scattering, because of the darkness of the cloud, creates the light."

According to Seneca, Naturae quastiones (II, 18).
Pseudo-Plutarch (III, 16)
It is then very likely that by observing the moon and the tides, Anaximander thought the latter were the cause, and not the effect of the satellite's movement.
Pseudo-Plutarch (V, 19)
Censorinus, De Die Natali, IV, 7
Plutarch also mentions Anaximander's theory that humans were born inside fish, feeding like sharks, and that when they could defend themselves, they were thrown ashore to live on dry land.

As established by Marcel Conche, Anaximandre. Fragments et témoignages, introduction (p. 43-47).
These accomplishments are often attributed to him, notably by Diogenes Laertius (II, 1) and by the Roman historian Eusebius of Caesarea, Preparation for the Gospel (X, 14, 11).

Da Divinatione (in Latin) (http://www.thelatinlibrary.com/cicero/divinatione1.shtml)
Martin Heidegger, Off the Beaten Track (Cambridge & New York: Cambridge University Press, 2002).

Themistius and Simplicius also mention some work "on nature". The list could refer to book titles or simply their topics. Again, no one can tell because there is no punctuation sign in Ancient Greek. Furthermore, this list is incomplete since the Suda ends it with ὄλλα τινά, thus implying "other works".

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## Primary sources

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- Aëtius: *De Fide* (I-III; V)
- Agathemerus: *A Sketch of Geography in Epitome* (I, 1)
- Aristotle: *Meteorology* (II, 3) Translated by E. W. Webster (http://etext.library.adelaide.edu.au/a/aristotle/meteorology/)
- Aristotle: *Physics* (III, 5, 204 b 33-34)
- Censorinus: *De Die Natali* (IV, 7) See original text at LacusCurtius (http://penelope.uchicago.edu/Thayer/L/Roman/Texts/Censorinus/text*.html)
- Cicero: *On divination* on Wikisource (I, 50, 112)
- Euripides: *The Suppliants* (532) Translated by E. P. Coleridge (http://etext.library.adelaide.edu.au/e/euripides/suppliants/)
- Hippolytus: *Refutation of All Heresies* (I, 5) Translated by Roberts and Donaldson (http://www.ccel.org/fathers2/ANF-05/ANF05-06.htm#TopOfPage)
- Pseudo-Plutarch: *The Doctrines of the Philosophers* (I, 3; I, 7; II, 20-28; III, 2-16; V, 19)
- Seneca the Younger: *Natural Questions* (II, 18)
- Simplicius: *Comments on Aristotle's Physics* (24, 13-25; 1121, 5-9)
- Themistius: *Oratio* (36, 317)
- *The Suda* Search for Anaximander online (http://www.stoa.org/sol/)

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• This article incorporates text from a publication now in the public domain: Chisholm, Hugh, ed (1911). *Encyclopædia Britannica* (Eleventh ed.). Cambridge University Press.

**External links**

• Philoctete - Anaximandre: Fragments (http://philoctetes.free.fr/unianaximandre.htm) (French) (English)
• The Internet Encyclopedia of Philosophy - Anaximander (http://www.utm.edu/research/iep/a/anaximan.htm)
• Extensive bibliography by Dirk Couprie (http://www.dirkcouprie.nl/Anaximander-bibliography.htm)
Anaximenes of Miletus

Anaximenes (Greek: Ἄναξιμένης) of Miletus (b. 585 BCE, d. 528 BCE) was an Archaic Greek Pre-Socratic philosopher also known as the father of philosophy active in the latter half of the 6th century BC. One of the three Milesian philosophers, he is identified as a younger friend or student of Anaximander. Anaximenes, like others in his school of thought, practiced material monism. This tendency to identify one specific underlying reality made up of a material thing constitutes the bulk of the contributions for which Anaximenes is most famed.

Anaximenes and the Arche

While his predecessors Thales and Anaximander proposed that the arche, the underlying material of the world, were water and the ambiguous substance apeiron, respectively, Anaximenes asserted that air was this most basic stuff of which all other things are made. To him air was not just one of the four basic elements but was the substance from which all things came and to which they would all eventually return. While the choice of air may seem arbitrary, he based his conclusion on naturally observable phenomena in the process of rarefaction and condensation. When air condenses it becomes visible, as mist and then rain and other forms of precipitation, and as the condensed air cools Anaximenes supposed that it went on to form earth and ultimately stones. In contrast, water evaporates into air which ignites and produces flame when further rarefied. While other philosophers also recognized such transitions in states of matter, Anaximenes was the first to associate the quality pairs hot/dry and cold/wet with the density of a single material and add a quantitative dimension to the Milesian monistic system.

The Origin of the Cosmos

Having concluded that everything in the world is composed of air, Anaximenes then used his theory to devise a scheme explaining the origins and nature of the earth as well as of the surrounding celestial bodies. Air felted to create the flat disk of the earth, which he said was table-like and behaved like a leaf floating on air. In keeping with the prevailing view of celestial bodies as balls of fire in the sky, Anaximenes proposed that the earth let out an exhalation of air that rarefied, ignited and became the stars. While the sun is similarly described as being aflame, it is not composed of rarefied air like the stars but rather of earth like the moon; its burning comes not from its composition but rather from its rapid motion. The moon and sun are likewise considered to be flat and floating on streams of air, and when the sun sets it does not pass under the earth but is merely obscured by higher parts of the earth as it circles around and becomes more distant; the motion of the sun and the other celestial bodies around the earth is likened by Anaximenes to the way that a cap may be turned around the head.

Other Phenomena

Anaximenes used his observations and reasoning to provide causes for other natural phenomena on the earth as well. Earthquakes he asserted were the result either of lack of moisture, which causes the earth to break apart because of how parched it is, or of overabundance thereof, which also causes cracks in the earth because of the excess of water. In either case the earth becomes weakened by its cracks and hills collapse, causing earthquakes. Lightning is also caused by a violent separation, this time of clouds by winds to create a bright, fire-like flash. Rainbows are formed
when densely compressed air is touched by the rays of the sun. These examples further show how Anaximenes like the other Milesians looked for the broader picture in nature, seeking unifying causes for diversely occurring events rather than treating each one on a case-by-case basis or attributing them to gods or a personified nature.

References


Further reading


External links

• Diogenes Laërtius, Life of Anaximenes, translated by Robert Drew Hicks (1925).
Pythagoreanism

Pythagoreanism

Pythagoreanism is a term used for the esoteric and metaphysical beliefs held by Pythagoras and his followers, the Pythagoreans, who were considerably influenced by mathematics. Pythagoreanism greatly influenced Platonism. Later revivals of Pythagorean doctrines led to what is now called Neopythagoreanism.

Two schools

According to tradition, Pythagoreanism developed at some point into two separate schools of thought, the mathēmatikoi Μαθηματικοι ("learners") and the akousmatikoi Ακουσματικοι, ("listeners"). The mathēmatikoi were supposed to have extended and developed the more mathematical and scientific work begun by Pythagoras, while the akousmatikoi focused on the more religious and ritualistic aspects of his teachings. The akousmatikoi claimed that the mathēmatikoi were not genuinely Pythagorean, but followers of the "renegade" Pythagorean Hippasus. The mathēmatikoi, on the other hand, allowed that the akousmatikoi were Pythagorean, but felt that their own group was more representative of Pythagoras. [1]

Natural philosophy

Pythagorean thought was dominated by mathematics, but it was also profoundly mystical. In the area of cosmology there is less agreement about what Pythagoras himself actually taught, but most scholars believe that the Pythagorean idea of the transmigration of the soul is too central to have been added by a later follower of Pythagoras. The Pythagorean conception of substance, on the other hand, is of unknown origin, partly because various accounts of his teachings are conflicting. The Pythagorean account actually begins with Anaximander's teaching that the ultimate substance of things is "the boundless," or what Anaximander called the "apeiron." The Pythagorean account holds that it is only through the notion of the "limit" that the "boundless" takes form.
Pythagoras wrote nothing down, and relying on the writings of Parmenides, Empedocles, Philolaus and Plato (people either considered Pythagoreans, or whose works are thought deeply indebted to Pythagoreanism) results in a very diverse picture in which it is difficult to ascertain what the common unifying Pythagorean themes were. Relying on Philolaus, whom most scholars agree is highly representative of the Pythagorean school, one has a very intricate picture. Aristotle explains how the Pythagoreans (by which he meant the circle around Philolaus) developed Anaximander's ideas about the apeiron and the peiron, the unlimited and limited, by writing that:

... for they [the Pythagoreans] plainly say that when the one had been constructed, whether out of planes or of surface or of seed or of elements which they cannot express, immediately the nearest part of the unlimited began to be drawn in and limited by the limit.

Continuing with the Pythagoreans:

The Pythagoreans, too, held that void exists, and that it enters the heaven from the unlimited breath — it, so to speak, breathes in void. The void distinguishes the natures of things, since it is the thing that separates and distinguishes the successive terms in a series. This happens in the first case of numbers; for the void distinguishes their nature.

When the apeiron is inhaled by the peiron it causes separation, which also apparently means that it "separates and distinguishes the successive terms in a series." Instead of an undifferentiated whole we have a living whole of inter-connected parts separated by "void" between them. This inhalation of the apeiron is also what makes the world mathematical, not just possible to describe using maths, but truly mathematical since it shows numbers and reality to be upheld by the same principle. Both the continuum of numbers (that is yet a series of successive terms, separated by void) and the field of reality, the cosmos — both are a play of emptiness and form, apeiron and peiron. What really sets this apart from Anaximander's original ideas is that this play of apeiron and peiron must take place according to harmonia (harmony), about which Stobaeus commented:

About nature and harmony this is the position. The being of the objects, being eternal, and nature itself admit of divine, not human, knowledge — except that it was not possible for any of the things that exist and are known by us to have come into being, without there existing the being of those things from which the universe was composed, the limited and the unlimited. And since these principles existed being neither alike nor of the same kind, it would have been impossible for them to be ordered into a universe if harmony had not supervened — in whatever manner this came into being. Things that were alike and of the same kind had no need of harmony, but those that were unlike and not of the same kind and of unequal order — it was necessary for such things to have been locked together by harmony, if they are to be held together in an ordered universe.

A musical scale presupposes an unlimited continuum of pitches, which must be limited in some way in order for a scale to arise. The crucial point is that not just any set of limiters will do. One may not simply choose pitches at random along the continuum and produce a scale that will be musically pleasing. The diatonic scale, also known as "Pythagorean," is such that the ratio of the highest to the lowest pitch is 2:1, which produces the interval of an octave. That octave is in turn divided into a fifth and a fourth, which have the ratios of 3:2 and 4:3 respectively and which, when added, make an octave. If we go up a fifth from the lowest note in the octave and then up a fourth from there, we will reach the upper note of the octave. Finally the fifth can be divided into three whole tones, each corresponding to the ratio of 9:8 and a remainder with a ratio of 256:243 and the fourth into two whole tones with the same remainder. This is a good example of a concrete applied use of Philolaus' reasoning. In Philolaus' terms the fitting together of limiters and unlimiteds involves their combination in accordance with ratios of numbers (harmony). Similarly the cosmos and the individual things in the cosmos do not arise by a chance combination of limiters and unlimiteds; the limiters and unlimiteds must be fitted together in a "pleasing" (harmonic) way in accordance with number for an order to arise.

This teaching was recorded by Philolaus' pupil Archytas in a lost work entitled On Harmonics or On Mathematics, and this is the influence that can be traced in Plato. Plato's pupil Aristotle made a distinction in his Metaphysics between Pythagoreans and "so-called" Pythagoreans. He also recorded the Table of Opposites, and commented that
it might be due to Alcmaeon of the medical school at Croton, who defined health as a harmony of the elements in the body.

After attacks on the Pythagorean meeting-places at Croton, the movement dispersed, but regrouped in Tarentum, also in Southern Italy. A collection of Pythagorean writings on ethics collected by Taylor show a creative response to the troubles.

The legacy of Pythagoras, Socrates and Plato was claimed by the wisdom tradition of the Hellenized Jews of Alexandria, on the ground that their teachings derived from those of Moses. Through Philo of Alexandria this tradition passed into the Medieval culture, with the idea that groups of things of the same number are related or in sympathy. This idea evidently influenced Hegel in his concept of internal relations.

The ancient Pythagorean pentagram was drawn with two points up and represented the doctrine of Pentemychos. Pentemychos means "five recesses" or "five chambers," also known as the pentagonas — the five-angle, and was the title of a work written by Pythagoras' teacher and friend Pherecydes of Syros.\[2]\n
**Cosmology**

The Pythagoreans are known for their theory of the transmigration of souls, and also for their theory that numbers constitute the true nature of things. They performed purification rites and followed and developed various rules of living which they believed would enable their souls to achieve a higher rank among the gods. Much of their mysticism concerning the soul seems inseparable from the Orphic tradition. The Orphics included various purifactory rites and practices as well as incubatory rites of descent into the underworld. Apart from being linked with this, Pythagoras is also closely linked with Pherecydes of Syros, the man ancient commentators tend to credit as the first Greek to teach a transmigration of souls. Ancient commentators agree that Pherekydes was Pythagoras's most "intimate" teacher. Pherecydes expounded his teaching on the soul in terms of a pentemychos ("five-nooks," or "five hidden cavities") — the most likely origin of the Pythagorean use of the pentagram, used by them as a symbol of recognition among members and as a symbol of inner health (eugieia Eudaimonia).

*"Wheel of Birth" and scientific contemplation*

The Pythagoreans believed that a release from the "wheel of birth" was possible. They followed the Orphic traditions and practices to purify the soul but at the same time they suggested a deeper idea of what such a purification might be. Aristoxenus said that music was used to purify the soul just like medicine was used to purge the body. But in addition to this, Pythagoreans distinguished three kinds of lives: Theoretic, Practical and Apolautic. Pythagoras is said to have used the example of Olympic games to distinguish between these three kind of lives. Pythagoras suggests that the lowest class of people who come to the games are the people who come to buy or sell. The next higher class comprises people who come to participate in the games. And the highest class contains people who simply come to look on. Thus Pythagoras suggests that the highest purification of a life is in pure contemplation. It is the philosopher who contemplates about science and mathematics who is released from the "cycle of birth." The pure mathematician's life is, according to Pythagoras, the life at the highest plane of existence.\[3]\ [4]

Thus the root of mathematics and scientific pursuits in Pythagoreanism is also based on a spiritual desire to free oneself from the cycle of birth and death. It is this contemplation about the world that forms the greatest virtue in Pythagorean philosophy.
**Vegetarianism**

The Pythagoreans were well-known in antiquity for their vegetarianism, which they practised for religious, ethical and ascetic reasons, in particular the idea of metempsychosis - the transmigration of souls into the bodies of other animals.\(^5\) “Pythagorean diet” was a common name for the abstention from eating meat and fish, until the coining of "vegetarian" in the nineteenth century.\(^6\)

The Pythagorean code further restricted the diet of its followers, prohibiting the consumption or even touching of any sort of bean. It is probable that this is due to their belief in the soul, and the fact that beans obviously showed the potential for life. Some, for example Cicero,\(^7\) say perhaps the flatulence beans cause, perhaps as protection from potential favism, perhaps because they resemble the genitalia,\(^8\) but most likely for magico-religious reasons,\(^9\) such as the belief that beans and human beings were created from the same material.\(^10\) Most stories of Pythagoras' murder revolve around his aversion to beans. According to legend, enemies of the Pythagoreans set fire to Pythagoras' house, sending the elderly man running toward a bean field, where he halted, declaring that he would rather die than enter the field - whereupon his pursuers slit his throat.\(^11\)

**Views on women**

Women were given equal opportunity to study as Pythagoreans, and learned practical domestic skills in addition to philosophy.\(^12\) Women were held to be different from men, but sometimes in good ways.\(^12\) The priestess, philosopher and mathematician Themistoclea is regarded as Pythagoras' teacher; Theano, Damo and Melissa as female disciples. Pythagoras is also said to have preached that men and women ought not to have sex during the summer, holding that winter was the appropriate time.\(^13\)

**Neopythagoreanism**

Neopythagoreanism was a revival in the 2nd century BC—2nd century AD period of various ideas traditionally associated with the followers of Pythagoras, the Pythagoreans. Notable Neopythagoreans include first century Apollonius of Tyana and Moderatus of Gades. Middle and Neo-Platonists such as Numenius and Plotinus also showed some Neopythagorean influence.

They emphasized the distinction between the soul and the body. God must be worshipped spiritually by prayer and the will to be good. The soul must be freed from its material surroundings by an ascetic habit of life. Bodily pleasures and all sensuous impulses must be abandoned as detrimental to the spiritual purity of the soul. God is the principle of good; Matter the groundwork of Evil. The non-material universe was regarded as the sphere of mind or spirit.\(^14\)

In 1915, a subterranean basilica where 1st century Neo-Pythagoreans held their meetings was discovered near Porta Maggiore on Via Praenestina, Rome. The groundplan shows a basilica with three naves and an apse similar to early Christian basilicas that did not appear until much later, in the 4th century. The vaults are decorated with white stuccoes symbolizing Neopythagorean beliefs but its exact meaning remains a subject of debate.\(^15\)

**Influences**

* The Pythagorean idea that whole numbers and harmonic (euphonic) sounds are intimately connected in music, must have been well known to lute-player and maker Vincenzo Galilei, father of Galileo Galilei. While possibly following Pythagorean modes of thinking, Vincenzo is known to have discovered a new mathematical relationship between string tension and pitch, thus suggesting a generalization of the idea that music and musical instruments can be mathematically quantified and described. This may have paved the way to his son's crucial insight that all physical phenomena may be described quantitatively in mathematical language (as physical "laws"), thus beginning and defining the era of modern physics.
• Pythagoreanism has had a clear and obvious influence on the texts found in the hermetica corpus and thus flows over into hermeticism, gnosticism and alchemy.
• The Pythagorean cosmology also inspired the Arabic gnostic Monoimus to combine this system with monism and other things to form his own cosmology.
• The pentagram (five-pointed star) was an important religious symbol used by the Pythagoreans, which is often seen as being related to the elements theorized by Empedocles to comprise all matter.
• The Pythagorean school doubtless had a monumental impact on the development of numerology and number mysticism, an influence that still resonates today. For example, it is from the Pythagoreans that the number 3 acquires its modern reputation as the noblest of all digits.[16]
• The Pythagoreans were advised to “speak the truth in all situations,” which Pythagoras said he learned from the Magi of Babylon.

References
[1] On the two schools and these differences, see Charles Kahn, p. 15, Pythagoras and the Pythagoreans, Hackett 2001.
[2] This is actually a lost book whose contents are preserved in Damascius, de principiis, quoted in Kirk and Raven, The Pre-Socratic Philosophers, Cambridge Univ. Press, 1956, page 55.
[6] See for instance the popular treatise by Antonio Cocchi, Del vitto pitagorico per uso della medicina, Firenze 1743, which initiated a debate on the “Pythagorean diet”.
Further reading

- Riedweg, Christoph *Pythagoras: his life, teaching, and influence*; translated by Steven Rendall in collaboration with Christoph Riedweg and Andreas Schatzmann, Ithaca: Cornell University Press, (2005), ISBN 0-8014-4240-0

External links

- Pythagoreanism Web Article (http://cyberspacei.jesusi.inlight/philosophy/western/Pythagoreanism.htm)
- Pythagoreanism Discussion Group (http://groups.yahoo.com/group/Pythagorean-L)
- Pythagoreanism Web Site (http://users.ucom.net/~vegan)
- Pythagoreanism Web Site (http://www.fourfoldpath.org/pita.htm)
- Pythagoreanism (http://plato.stanford.edu/entries/pythagoreanism) entry by Carl Huffman in the *Stanford Encyclopedia of Philosophy*
Pythagoras

Pythagoras (Πυθαγόρας)

Full name | Pythagoras (Πυθαγόρας)
Born | c. 570 BC Samos Island
Died | c. 495 BC (aged around 75) Metapontum
Era | Ancient philosophy
Region | Western philosophy
School | Pythagoreanism
Main interests | Metaphysics, Music, Mathematics, Ethics, Politics
Notable ideas | Musica universalis, Golden ratio, Pythagorean tuning, Pythagorean theorem

Pythagoras of Samos (Ancient Greek: Ὁ Πυθαγόρας ὁ Σάμιος Ho Pythagóras ho Sámios "Pythagoras the Samian", or simply Ὁ Πυθαγόρας; c. 570–c. 495 BC[1]) was an Ionian Greek philosopher, mathematician, and founder of the religious movement called Pythagoreanism. Most of the information about Pythagoras was written down centuries after he lived, so that very little reliable information is known about him. He was born on the island of Samos, and may have travelled widely in his youth, visiting Egypt and other places seeking knowledge. He had a teacher named Themistoclea, who introduced him to the principles of ethics.[2] [3] Around 530 BC, he moved to Croton, a Greek colony in southern Italy, and there set up a religious sect. His followers pursued the religious rites and practices developed by Pythagoras, and studied his philosophical theories. The society took an active role in the politics of Croton, but this eventually led to their downfall. The Pythagorean meeting-places were burned, and Pythagoras was forced to flee the city. He is said to have ended his days in Metapontum.

Pythagoras made influential contributions to philosophy and religious teaching in the late 6th century BC. He is often revered as a great mathematician, mystic and scientist, and he is best known for the Pythagorean theorem which bears his name. However, because legend and obfuscation cloud his work even more than with the other pre-Socratic philosophers, one can say little with confidence about his teachings, and some have questioned whether he contributed much to mathematics and natural philosophy. Many of the accomplishments credited to Pythagoras may actually have been accomplishments of his colleagues and successors. Whether or not his disciples believed that everything was related to mathematics and that numbers were the ultimate reality is unknown. It was said that he was the first man to call himself a philosopher, or lover of wisdom,[4] and Pythagorean ideas exercised a marked influence on Plato, and through him, all of Western philosophy.
Biographical sources

Accurate facts about the life of Pythagoras are so few, and most information concerning him is of so late a date, and so untrustworthy, that it is impossible to provide more than a vague outline of his life. The lack of information by contemporary writers, together with the secrecy which surrounded the Pythagorean brotherhood, meant that invention took the place of facts. The stories which were created were eagerly sought by the Neoplatonist writers who provide most of the details about Pythagoras, but who were uncritical concerning anything which related to the gods or which was considered divine.\[^5\] Thus many myths were created — such as that Apollo was his father; that Pythagoras gleamed with a supernatural brightness; that he had a golden thigh; that Abaris came flying to him on a golden arrow; that he was seen in different places at one and the same time.\[^6\] With the exception of a few remarks by Xenophanes, Heraclitus, Herodotus, Plato, Aristotle, and Isocrates, we are mainly dependent on Diogenes Laërtius, Porphyry, and Iamblichus for the biographical details. Aristotle had written a separate work on the Pythagoreans, which unfortunately has not survived.\[^7\] His disciples Dicaearchus, Aristoxenus, and Heraclides Ponticus had written on the same subject. These writers, late as they are, were among the best sources from whom Porphyry and Iamblichus drew, besides the legendary accounts and their own inventions. Hence historians are often reduced to considering the statements based on their inherent probability, but even then, if all the credible stories concerning Pythagoras were supposed true, his range of activity would be impossibly vast.\[^8\]

Life

Herodotus, Isocrates, and other early writers all agree that Pythagoras was born on Samos, the Greek island in the eastern Aegean, and we also learn that Pythagoras was the son of Mnesarchus.\[^9\] His father was a gem-engraver or a merchant. His name led him to be associated with Pythian Apollo; Aristippus explained his name by saying, "He spoke \textit{(agor-)} the truth no less than did the Pythian \textit{(Pyth-)}," and Iamblichus tells the story that the Pythia prophesied that his pregnant mother would give birth to a man supremely beautiful, wise, and beneficial to humankind.\[^10\] A late source gives his mother's name as Pythais.\[^11\] As to the date of his birth, Aristoxenus stated that Pythagoras left Samos in the reign of Polycrates, at the age of 40, which would give a date of birth around 570 BC.\[^12\]

It was natural for the ancient biographers to inquire as to the origins of Pythagoras' remarkable system. In the absence of reliable information, however, a huge range of teachers were assigned to Pythagoras. Some made his training almost entirely Greek, others exclusively Egyptian and Oriental. We find mentioned as his instructors Creophylus,\[^13\] Hermodamas,\[^14\] Bias,\[^13\] Thales,\[^13\] Anaximander,\[^15\] and Pherecydes of Syros.\[^16\] The Egyptians are said to have taught him geometry, the Phoenicians arithmetic, the Chaldeans astronomy, the Magians the principles of religion and practical maxims for the conduct of life.\[^17\] Of the various claims regarding his Greek teachers, Pherecydes is mentioned most often.

It was the standard belief in antiquity that Pythagoras had undertaken extensive travels, and had visited not only Egypt, but Arabia, Phoenicia, Judaea, Babylon, and even India, for the purpose of collecting all available knowledge, and especially to learn information concerning the secret or mystic cults of the gods.\[^18\] The journey to Babylon is possible, and not very unlikely. Plutarch asserted in his book \textit{On Isis and Osiris} that during his visit to Egypt, Pythagoras received instruction from the Egyptian priest Oenuphis of Heliopolis.\[^19\] Other ancient writers asserted his visit to Egypt.\[^20\] Enough of Egypt was known to attract the curiosity of an inquiring Greek, and contact between
Samos and other parts of Greece with Egypt is mentioned.[21]

It is not easy to say how much Pythagoras learned from the Egyptian priests, or indeed, whether he learned anything at all from them. There was nothing in the symbolism which the Pythagoreans adopted which showed the distinct traces of Egypt. The secret religious rites of the Pythagoreans exhibited nothing but what might have been adopted in the spirit of Greek religion, by those who knew nothing of Egyptian mysteries. The philosophy and the institutions of Pythagoras might easily have been developed by a Greek mind exposed to the ordinary influences of the age. Even the ancient authorities note the similarities between the religious and ascetic peculiarities of Pythagoras with the Orphic or Cretan mysteries,[22] or the Delphic oracle.[23]

There is little direct evidence as to the kind and amount of knowledge which Pythagoras acquired, or as to his definite philosophical views. Everything of the kind mentioned by Plato and Aristotle is attributed not to Pythagoras, but to the Pythagoreans. Heraclitus stated that he was a man of extensive learning,[24] and Xenophanes claimed that he believed in the transmigration of souls.[25] Xenophanes mentions the story of his interceding on behalf of a dog that was being beaten, professing to recognise in its cries the voice of a departed friend. Pythagoras is supposed to have claimed that he had been Euphorbus, the son of Panthus, in the Trojan war, as well as various other characters, a tradesman, a courtesan, etc.[26]

Many mathematical and scientific discoveries were attributed to Pythagoras, including his famous theorem,[27] as well as discoveries in the field of music,[28] astronomy,[29] and medicine.[30] But it was the religious element which made the profoundest impression upon his contemporaries. Thus the people of Croton were supposed to have identified him with the Hyperborean Apollo,[31] and he was said to have practised divination and prophecy.[32] In the visits to various places in Greece – Delos, Sparta, Phlius, Crete, etc. which are ascribed to him, he usually appears either in his religious or priestly guise, or else as a lawgiver.[33]

After his travels, Pythagoras moved (around 530 BC) to Croton, in Italy (Magna Graecia). Possibly the tyranny of Polycrates in Samos made it difficult for him to achieve his schemes there. His later admirers claimed that Pythagoras was so overburdened with public duties in Samos, because of the high estimation in which he was held by his fellow-citizens, that he moved to Croton.[34] On his arrival in Croton, he quickly attained extensive influence, and many people began to follow him. Later biographers tell fantastical stories of the effects of his eloquent speech in leading the people of Croton to abandon their luxurious and corrupt way of life and devote themselves to the purer system which he came to introduce.[35]

His followers established a select brotherhood or club for the purpose of pursuing the religious and ascetic practices developed by their master. The accounts agree that what was done and taught among the members was kept a profound secret. The esoteric teachings may have concerned the secret religious doctrines and usages, which were undoubtedly prominent in the Pythagorean system, and may have been connected with the worship of Apollo.[36] Temperance of all kinds seems to have been strictly urged. There is disagreement among the biographers as to whether Pythagoras forbade all animal food,[37] or only certain types.[38] The club was in practice at once "a philosophical school, a religious brotherhood, and a political association."

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Croton on the southern coast of Italy
Such an aristocratic and exclusive club could easily have made many people in Croton jealous and hostile, and this seems to have led to its destruction. The circumstances, however, are uncertain. Conflict seems to have broken out between the towns of Sybaris and Croton. The forces of Croton were headed by the Pythagorean Milo, and it is likely that the members of the brotherhood took a prominent part. After the decisive victory by Croton, a proposal for establishing a more democratic constitution, was unsuccessfully resisted by the Pythagoreans. Their enemies, headed by Cylon and Ninon, the former of whom is said to have been irritated by his exclusion from the brotherhood, roused the populace against them. An attack was made upon them while assembled either in the house of Milo, or in some other meeting-place. The building was set on fire, and many of the assembled members perished; only the younger and more active escaping.\[40] Similar commotions ensued in the other cities of Magna Graecia in which Pythagorean clubs had been formed.

As an active and organised brotherhood the Pythagorean order was everywhere suppressed, and did not again revive. Still the Pythagoreans continued to exist as a sect, the members of which kept up among themselves their religious observances and scientific pursuits, while individuals, as in the case of Archytas, acquired now and then great political influence. Concerning the fate of Pythagoras himself, the accounts varied. Some say that he perished in the temple with his disciples,\[41] others that he fled first to Tarentum, and that, being driven from there, he escaped to Metapontum, and there starved himself to death.\[42] His tomb was shown at Metapontum in the time of Cicero.\[43] According to some accounts Pythagoras married Theano, a lady of Croton. Their children are variously stated to have included a son, Telauges, and three daughters, Damo, Arignote, and Myia.

**Writings**

No texts by Pythagoras are known to have survived, although forgeries under his name — a few of which remain extant — did circulate in antiquity. Critical ancient sources like Aristotle and Aristoxenus cast doubt on these writings. Ancient Pythagoreans usually quoted their master's doctrines with the phrase *autos ephe* ("he himself said") — emphasizing the essentially oral nature of his teaching.

**Mathematics**

The so-called Pythagoreans, who were the first to take up mathematics, not only advanced this subject, but saturated with it, they fancied that the principles of mathematics were the principles of all things.

**Pythagorean theorem**

Since the fourth century AD, Pythagoras has commonly been given credit for discovering the Pythagorean theorem, a theorem in geometry that states that in a right-angled triangle the area of the square on the hypotenuse (the side opposite the right angle) is equal to the sum of the areas of the squares of the other two sides—that is, \(a^2 + b^2 = c^2\).

While the theorem that now bears his name was known and previously utilized by the Babylonians and Indians, he, or his students, are often said to have constructed the first proof. It must, however, be stressed that the way in which the Babylonians handled Pythagorean numbers implies that they knew that the principle was generally applicable, and knew some kind of proof, which has not yet been found in the (still largely unpublished) cuneiform sources. Because of the secretive nature of his school and the custom of its students to attribute everything to their teacher, there is no evidence that Pythagoras himself worked on or proved this theorem. For that matter, there is no evidence that he worked on any mathematical or meta-mathematical problems. Some attribute it as a carefully constructed myth by followers of Plato over two centuries after the death of Pythagoras, mainly to bolster the case for Platonic meta-physics, which resonate well with the ideas they attributed to Pythagoras. This attribution has stuck down the centuries up to modern times. The earliest known mention of Pythagoras's name in connection with the theorem occurred five centuries after his death, in the writings of Cicero and Plutarch.

**Musical theories and investigations**

According to legend, the way Pythagoras discovered that musical notes could be translated into mathematical equations was when one day he passed blacksmiths at work, and thought that the sounds emanating from their anvils being hit were beautiful and harmonious and decided that whatever scientific law caused this to happen must be mathematical and could be applied to music. He went to the blacksmiths to learn how this had happened by looking at their tools, he discovered that it was because the hammers were "simple ratios of each other, one was half the size of the first, another was 2/3 the size, and so on."

This legend has since proven to be false by virtue of the fact that these ratios are only relevant to string length (such as the string of a monochord), and not to hammer weight. However, it may be that Pythagoras was indeed responsible for discovering these properties of string length.

Pythagoreans elaborated on a theory of numbers, the exact meaning of which is still debated among scholars. Another belief attributed to Pythagoras was that of the "harmony of the spheres". Thus the planets and stars moved according to mathematical equations, which corresponded to musical notes and thus produced a symphony.
Tetractys

Pythagoras was also credited with devising the tetractys, the triangular figure of four rows, which add up to the perfect number, ten. As a mystical symbol, it was very important to the worship of the Pythagoreans, who would swear oaths by it:

And the inventions were so admirable, and so divinised by those who understood them, that the members used them as forms of oath: "By him who handed to our generation the tetractys, source of the roots of ever-flowing nature."
—Iamblichus, Vit. Pyth., 29

Religion and science

Pythagoras' religious and scientific views were, in his opinion, inseparably interconnected. Religiously, Pythagoras was a believer of metempsychosis. He believed in transmigration, or the reincarnation of the soul again and again into the bodies of humans, animals, or vegetables until it became immortal. His ideas of reincarnation were influenced by ancient Greek religion. Heraclides Ponticus reports the story that Pythagoras claimed that he had lived four lives that he could remember in detail, and, according to Xenophanes, Pythagoras heard the cry of his dead friend in the bark of a dog.

Lore

Pythagoras became the subject of elaborate legends surrounding his historic persona. Aristotle described Pythagoras as a wonder-worker and somewhat of a supernatural figure, attributing to him such aspects as a golden thigh, which was a sign of divinity. According to Muslim tradition, Pythagoras was said to have been initiated by Hermes (Egyptian Thoth). According to Aristotle and others' accounts, some ancients believed that he had the ability to travel through space and time, and to communicate with animals and plants. An extract from Brewer's Dictionary of Phrase and Fable's entry entitled "Golden Thigh":

Pythagoras is said to have had a golden thigh, which he showed to Abaris, the Hyperborean priest, and exhibited in the Olympic games.

Another legend describes his writing on the moon:

Pythagoras asserted he could write on the moon. His plan of operation was to write on a looking-glass in blood, and place it opposite the moon, when the inscription would appear photographed or reflected on the moon’s disc.
Pythagoreans

Both Plato and Isocrates affirm that, above all else, Pythagoras was famous for leaving behind him a way of life.[55] Both Iamblichus and Porphyry give detailed accounts of the organisation of the school, although the primary interest of both writers is not historical accuracy, but rather to present Pythagoras as a divine figure, sent by the gods to benefit humankind.[56]

Pythagoras set up an organization which was in some ways a school, in some ways a brotherhood (and here it should be noted that sources indicate that as well as men there were many women among the adherents of Pythagoras),[57] and in some ways a monastery. It was based upon the religious teachings of Pythagoras and was very secretive. The adherents were bound by a vow to Pythagoras and each other, for the purpose of pursuing the religious and ascetic observances, and of studying his religious and philosophical theories. The claim that they put all their property into a common stock is perhaps only a later inference from certain Pythagorean maxims and practices.[58]

As to the internal arrangements of the sect, we are informed that what was done and taught among the members was kept a profound secret towards all. Porphyry stated that this silence was "of no ordinary kind." Candidates had to pass through a period of probation, in which their powers of maintaining silence (echemythia) were especially tested, as well as their general temper, disposition, and mental capacity.[59] There were also gradations among the members themselves. It was an old Pythagorean maxim, that every thing was not to be told to every body.[60] Thus the Pythagoreans were divided into an inner circle called the mathematikoi ("learners") and an outer circle called the akousmatikoi ("listeners").[61] Iamblichus describes them in terms of esoterikoi and exoterikoi (or alternatively Pythagoreioi and Pythagoristai),[62] according to the degree of intimacy which they enjoyed with Pythagoras. Porphyry wrote "the mathematikoi learned the more detailed and exactly elaborated version of this knowledge, the akousmatikoi (were) those who had heard only the summary headings of his (Pythagoras's) writings, without the more exact exposition."

There were ascetic practices (many of which had, perhaps, a symbolic meaning) in the way of life of the sect.[63] Some represent Pythagoras as forbidding all animal food. This may have been due to the doctrine of metempsychosis.[64] Other authorities contradict the statement. According to Aristoxenus,[65] he allowed the use of all kinds of animal food except the flesh of oxen used for ploughing, and rams.[66] There is a similar discrepancy as to the prohibition of fish and beans.[67] But temperance of all kinds seems to have been urged. It is also stated that they had common meals, resembling the Spartan system, at which they met in companies of ten.[68]

Considerable importance seems to have been attached to music and gymnastics in the daily exercises of the disciples. Their whole discipline is represented as encouraging a lofty serenity and self-possession, of which, there were various anecdotes in antiquity.[69] Iamblichus (apparently on the authority of Aristoxenus)[70] gives a long description of the daily routine of the members, which suggests many similarities with Sparta. The members of the sect showed a devoted attachment to each other, to the exclusion of those who did not belong to their ranks.[71] There were even stories of secret symbols, by which members of the sect could recognise each other, even if they had never met before.[72]
Influence

Influence on Plato

Pythagoras, or in a broader sense, the Pythagoreans, allegedly exercised an important influence on the work of Plato. According to R. M. Hare, this influence consists of three points: (1) The platonic Republic might be related to the idea of "a tightly organized community of like-minded thinkers", like the one established by Pythagoras in Croton. (2) There is evidence that Plato possibly took from Pythagoras the idea that mathematics and, generally speaking, abstract thinking is a secure basis for philosophical thinking as well as "for substantial theses in science and morals". (3) Plato and Pythagoras shared a "mystical approach to the soul and its place in the material world". It is probable that both were influenced by Orphism.[73]

Aristotle claimed that the philosophy of Plato closely followed the teachings of the Pythagoreans,[74] and Cicero repeats this claim: Plato ferunt didicisse Pythagorea omnia ("They say Plato learned all things Pythagorean").[75] Bertrand Russell, in his A History of Western Philosophy, contended that the influence of Pythagoras on Plato and others was so great that he should be considered the most influential of all Western philosophers.

Influence on esoteric groups

Pythagoras started a secret society called the Pythagorean brotherhood devoted to the study of mathematics. This had a great effect on future esoteric traditions, such as Rosicrucianism and Freemasonry, both of which were occult groups dedicated to the study of mathematics and both of which claimed to have evolved out of the Pythagorean brotherhood. The mystical and occult qualities of Pythagorean mathematics are discussed in a chapter of Manly P. Hall's The Secret Teachings of All Ages entitled "Pythagorean Mathematics".

Pythagorean theory was tremendously influential on later numerology, which was extremely popular throughout the Middle East in the ancient world. The 8th-century Muslim alchemist Jabir ibn Hayyan grounded his work in an elaborate numerology greatly influenced by Pythagorean theory. Today, Pythagoras is revered as a prophet by the Ahl al-Tawhid or Druze faith along with his fellow Greek, Plato.

References

[1] "The dates of his life cannot be fixed exactly, but assuming the approximate correctness of the statement of Aristozenus (ap. Porph. V.P. 9) that he left Samos to escape the tyranny of Polycrates at the age of forty, we may put his birth round about 570 BC, or a few years earlier. The length of his life was variously estimated in antiquity, but it is agreed that he lived to a fairly ripe old age, and most probably he died at about seventy-five or eighty." William Keith Chambers Guthrie, (1978), A history of Greek philosophy, Volume 1: The earlier Presocratics and the Pythagoreans, page 173. Cambridge University Press
[8] This article incorporates text from the public domain Dictionary of Greek and Roman Biography and Mythology by William Smith (1870).
Pythagoras elaborated by Neopythagoreans and Neoplatonists that determined the idea of what was Pythagorean over the centuries. In fact, as a rule it was the image of Pythagoras, the Presocratic charismatic from Samos, so fascinating. As a palimpsest of philosophy, and had this idea of what was Pythagorean so fascinating. In fact, as a rule it was the image of Pythagoras, the Presocratic charismatic from Samos, so fascinating. As a palimpsest of philosophy, and had this idea of what was Pythagorean so fascinating. In fact, as a rule it was the image of Pythagoras, the Presocratic charismatic from Samos, so fascinating. As a palimpsest of philosophy, and had this idea of what was Pythagorean so fascinating.
Sources

Classical secondary sources

Only a few relevant source texts deal with Pythagoras and the Pythagoreans, most are available in different translations. Other texts usually build solely on information in these works.

- Diogenes Laërtius, *Vitae philosophorum VIII* (*Lives of Eminent Philosophers*), c. 200 AD, which in turn references the lost work *Successions of Philosophers* by Alexander Polyhistor — *Life of Pythagoras*, translated by Robert Drew Hicks (1925).
- Iamblichus, *De Vita Pythagorica* (*On the Pythagorean Life*), c. 300 AD — *Iamblichus, Life of Pythagoras* (http://www.completepythagoras.net/mainframeset.html), translated by Kenneth Sylvan Guthrie (1920)
- Apuleius also writes about Pythagoras in *Apologia*, c. 150 AD, including a story of him being taught by Babylonian disciples of Zoroaster
- Hierocles of Alexandria, *Golden Verses of Pythagoras*, c. 430 AD
Modern secondary sources


External links

- Pythagoras (http://www.bbc.co.uk/programmes/b00p693b) on In Our Time at the BBC. (listen now (http://www.bbc.co.uk/iplayer/console/b00p693b/In_Our_Time_Pythagoras))
- Pythagoras (http://plato.stanford.edu/entries/pythagoras) entry by Carl Huffman in the *Stanford Encyclopedia of Philosophy*
- *Pythagoras of Samos* (http://www-history.mcs.st-andrews.ac.uk/Mathematicians/Pythagoras.html), The MacTutor History of Mathematics archive, School of Mathematics and Statistics, University of St Andrews, Scotland
- *Pythagoras and the Pythagoreans, Fragments and Commentary* (http://history.hanover.edu/texts/presoc/pythagor.htm), Arthur Fairbanks Hanover Historical Texts Project, Hanover College Department of History
- *Pythagoras and the Pythagoreans* (http://www.math.tamu.edu/~don.allen/history/pythag/pythag.html), Department of Mathematics, Texas A&M University
- *Pythagoras and Pythagoreanism* (http://www.newadvent.org/cathen/12587b.htm), The Catholic Encyclopedia
- *Pythagoras on Vegetarianism* (http://www.animalrightshistory.org/animal-rights-antiquity/pythagoras.htm) Quotes from primary source historical literature on Pythagoras’ view on Vegetarianism, Justice and Kindness
- *Homage to Pythagoras* (http://users.ucom.net/~vegan/)
- *Pythagoreanism Web Article* (http://cyberspacei.com/jesusi/inlight/philosophy/western/Pythagoreanism.htm)
- 45-minute documentary (http://freedocumentaries.net/media/164/Pythagoras/) about Pythagoras
- Io and Pi – theatrical play on Pythagoras’ life (http://www.regolish.com/Plays.htm)
- The Symbols (http://www.sacred-texts.com/cla/gvp/gvp11.htm) of Pythagoras at The Sacred Texts online
Philolaus

Philolaus (Greek: Φιλόλαος; c. 470–c. 385 BCE[1]) was a Greek Pythagorean and Presocratic philosopher. He argued that all matter is composed of limiting and limitless things, and that the universe is determined by numbers. He is credited with originating the theory that the earth was not the center of the universe.

Life

Philolaus is variously reported as being born in either Croton,[2] Tarentum,[3] or Metapontum.[4] All three places were located in southern Italy. He may have fled the second burning of the Pythagorean meeting-place around 454 BCE,[5] after which he migrated to Greece. According to Plato's Phaedo, he was the instructor of Simmias and Cebes at Thebes, around the time the Phaedo takes place, in 399 BCE.[6] This would make him a contemporary of Socrates, and agrees with the statement that Philolaus and Democritus were contemporaries.[7] The various reports about his life are scattered among the writings of much later writers and are of dubious value in reconstructing his life. He apparently lived for some time at Heraclea, where he was the pupil of Aresas, or (as Plutarch calls him) Arcesus.[8] Diogenes Laërtius is the only authority for the claim that Plato, shortly after the death of Socrates, traveled to Italy where he met with Philolaus and Eurytus.[9] The pupils of Philolaus and were said to have included Xenophilus, Phanto, Echecrates, Diocles and Polymnastus.[10] As to his death, Diogenes Laërtius reports a dubious story that Philolaus was put to death at Croton on account of being suspected of wanting to be the tyrant;[11] a story which Laërtius even took the trouble to put into verse.[12]

Writings

Diogenes Laërtius speaks of Philolaus composing one book,[13] but elsewhere he speaks of three books,[14] as do Aulus Gellius and Iamblichus. It may have been one treatise, divided into three books. Plato is said to have procured a copy of his book, from which, it was later claimed, Plato composed much of his Timaeus.[15] One of the works of Philolaus was called On Nature,[13] which seems to be the same work which Stobaeus calls On the World, and from which he has preserved a series of passages.[16] Other writers refer to a work entitled Bacchae, which may have been another name for the same work.

Cosmology

Philolaus did away with the ideas of fixed direction in space, and developed one of the first non-geocentric views of the universe. His new way of thinking quite literally revolved around a hypothetical astronomical object he called the Central Fire.

Philolaus says that there is fire in the middle at the centre ... and again more fire at the highest point and surrounding everything. By nature the middle is first, and around it dance ten divine bodies - the sky, the planets, then the sun, next the moon, next the earth, next the counterearth, and after all of them the fire of the hearth which holds position at the centre. The highest part of the surrounding, where the elements are found in their purity, he calls Olympus; the regions beneath the orbit of Olympus, where are the five planets with the sun and the moon, he calls the world; the part under them, being beneath the moon and around the earth, in
which are found generation and change, he calls the sky.

—Stobaeus, i. 22. 1d

A popular misconception about Philolaus is that he supposed that a sphere of the fixed stars, the five planets, the Sun, Moon and Earth, all moved round his Central Fire, but as these made up only nine revolving bodies, he conceived in accordance with his number theory a tenth, which he called Counter-Earth. This fallacy grows largely out of Aristotle’s attempt to lampoon his ideas in his book, Metaphysics. In reality, Philolaus’ ideas predated the idea of spheres by hundreds of years. He never recognized the fixed stars as any kind of sphere or object.

His ideas about the nature of the Earth’s place in the cosmos was influential. Nicolaus Copernicus mentions in De revolutionibus that Philolaus already knew about the Earth’s revolution around a central fire.

Philolaus argued that all matter is composed of limiters and unlimiteds. Limiters set boundaries, such as shape and quantity. Unlimiteds are universal forms and rules such as the four elements of earth, air, fire and water and the continua of space and time. Limiters and unlimiteds are combined together in a harmony (harmonia):

This is the state of affairs about nature and harmony. The essence of things is eternal; it is a unique and divine nature, the knowledge of which does not belong to man. Still it would not be possible that any of the things that are, and are known by us, should arrive to our knowledge, if this essence was not the internal foundation of the principles of which the world was founded, that is, of the limiting and unlimited elements. Now since these principles are not mutually similar, neither of similar nature, it would be impossible that the order of the world should have been formed by them, unless the harmony intervened . . .

—Philolaus, Frag. 6a.

This harmony can be described mathematically (similar to the combinations of elements in modern chemistry). Philolaus used the musical scale to illustrate his philosophy, whereby whole number ratios limit pleasing sounds (e.g., the octave, fifth, and fourth are defined by the ratios 2 : 1, 4 : 3 and 3 : 2). Philolaus also regarded the soul as a "mixture and harmony" of the bodily parts.

Notes
[1] "The most likely date for Philolaus' birth would then appear to be around 470, although he could have been born as early as 480 or as late as 440. He appears to have lived into the 380s and at the very least until 399." Carl A. Huffman, (1993) Philolaus of Croton: Pythagorean and Presocratic, pages 5-6. Cambridge University Press
[2] Iamblichus, Vita Pythagorica, 148
[3] Iamblichus, Vita Pythagorica, 267; Diogenes Laërtius, viii, 46
[4] Iamblichus, Vita Pythagorica, 266-67
[5] Not to be confused with the first burning of the meeting place, in the lifetime of Pythagoras, c. 509 BC
[6] Plato, Phaedo, 61DE
[8] Iamblichus, Vita Pythagorica; comp. Plutarch, de Gen. Socr. 13, though the account given by Plutarch involves great inaccuracies
[9] Diogenes Laërtius, iii, 6
[10] Diogenes Laërtius, viii, 46
[11] "The story at D.L. 84 that Philolaus was killed because he was thought to be aiming at a tyranny is clearly a confusion with Dion who is mentioned in the context and did have such a death." Carl A. Huffman, (1993) Philolaus of Croton: Pythagorean and Presocratic, page 6. Cambridge University Press
[12] Diogenes Laërtius, iii, 84; cf. Suda, Philolaus
[14] Diogenes Laërtius, iii, 9, viii, 15
[15] Diogenes Laërtius, viii, 15, 55, 84, 85, iii, 9; Aulus Gellius, iii, 17; Iamblichus, Vita Pythagorica; Tzetzes, Chiliad, x. 792, xi, 38
[16] DK 44 B 2, 3, 4, 5, 6, 7
Alcmaeon of Croton

Alcmaeon (Gr. Ἀλκμαίων, Alkmaion, gen.: Ἀλκμαίωνος; 5th century BC) of Croton (in Magna Græcia) was one of the most eminent natural philosophers and medical theorists of antiquity. His father's name was Peirithus (Peirithos). He is said by some to have been a pupil of Pythagoras, and he may have been born around 510 BC.[1] Although he wrote mostly on medical topics there is some suggestion that he was not a physician but a philosopher of science; he also indulged in astrology and meteorology. Nothing more is known of the events of his life.[2]

Works

He was considered by many an early pioneer and advocate of anatomical dissection and was said to be the first to identify Eustachian tubes. His celebrated discoveries in the field of dissection were noted in antiquity, but whether his knowledge in this branch of science was derived from the dissection of animals or of human bodies is still a disputed question.[3] Calcidius, on whose authority the fact rests, merely says "qui primus exsectionem aggredi est ausus," and the word exsectio would apply equally well in either case;[4] some modern scholars doubt Calcidius' word entirely.[5]

He also was the first to dwell on the internal causes of illnesses. It was he who first suggested that health was a state of equilibrium between opposing humors and that illnesses were because of problems in environment, nutrition and lifestyle. He is said also to have been the first person who wrote on natural philosophy (φυσικὸν λόγον),[6][7] and to have invented fables.[8] He also wrote several other medical and philosophical works, of which nothing but the titles and a few fragments have been preserved by Stobaeus,[9] Plutarch,[10] and Galen.[11] His Concerning Nature might be the earliest example of Greek medical literature.

Alcmaeon of Croton experimented with live animals by cutting the nerve behind the eye to study vision. He also contributed to the study of medicine by establishing the connection between the brain and the sense organs, and outlined the paths of the optic nerves as well as stating that the brain is the organ of the mind. However, his theories were not without mistakes. He said that sleep occurs when blood vessels in the brain are filled and that waking is caused by the emptying of these vessels. He also stated that the eye contains both fire and water.[12][13]

Pythagorean

Although Alcmaeon is often called a pupil of Pythagoras, there is great reason to doubt whether he was a Pythagorean at all;[14] his name seems to have crept into lists of Pythagoreans given us by later writers.[15] Aristotle mentions him as nearly contemporary with Pythagoras, but distinguishes between the stoicheia (στοιχεῖα) of opposites, under which the Pythagoreans included all things;[16] and the double principle of Alcmaeon, according to Aristotle, less extended, although he does not explain the precise difference. Other doctrines of Alcmaeon have been preserved to us. He said that the human soul was immortal and partook of the divine nature, because like the heavenly bodies it contained in itself a principle of motion.[17][18] The eclipse of the moon, which was also eternal, he supposed to arise from its shape, which he said was like a boat. All his doctrines which have come down to us
relate to physics or medicine; and seem to have arisen partly out of the speculations of the Ionian School, with which rather than the Pythagorean, Aristotle appears to connect Alcmaeon, partly from the traditional lore of the earliest medical science.[15]

**References**

- This article incorporates text from the public domain Dictionary of Greek and Roman Biography and Mythology by William Smith (1870).

**Notes**

[1] "There is disagreement about the date of his birth: Aristotle says that "Alcmaeon of Croton lived when Pythagoras was old," [Metaphysics, 1, v, 30, 986a] but it would appear that the passage is interpolated. Diogenes Laërtius states that he was a disciple of Pythagoras, [viii. 83] and this could have been possible if we assume that the latter died about 490 and that Alcmaeon was born about 510 BC." Plinio Prioreschi, (1996), A History of Medicine: Greek medicine, page 167.


[3] Dict. of Ant., p. 756, a


[7] Clement of Alexandria, Stromata i. p. 308

[8] fabulas, Isid. Orig. i. 39


[17] Aristotle, de Anima, i. 2, p. 405

[18] Cicero, De Natura Deorum i. 11

**Further reading**


- Mansfeld, Jaap (1975). "Alcmeon: 'Physikos' or Physician?". In de Vogel, C.J.; Mansfeld, Jaap; de Rijk, Lambertus Marie. Kephalaion: Studies in Greek Philosophy and its Continuation Offered to Professor C. J. de
Vogel. Assen: Van Gorcum.


**External links**

- Alcmaeon (http://plato.stanford.edu/entries/alcmaeon) entry by Carl Huffman in the *Stanford Encyclopedia of Philosophy*
Archytas (Greek: Ἀρχύτας; 428–347 BC) was an Ancient Greek philosopher, mathematician, astronomer, statesman, and strategist. He was a scientist of the Pythagorean school and famous for being the reputed founder of mathematical mechanics, as well as a good friend of Plato.
Life and work

Archytas was born in Tarentum, Magna Graecia (now southern Italy) and was the son of Mnesagoras or Histiaeus. For a while, he was taught by Philolaus, and was a teacher of mathematics to Eudoxus of Cnidus. Archytas and Eudoxus' student was Menaechmus.

Archytas is believed to be the founder of mathematical mechanics.[1] As only described in the writings of Aulus Gellius five centuries after him, he was reputed to have designed and built the first artificial, self-propelled flying device, a bird-shaped model propelled by a jet of what was probably steam, said to have actually flown some 200 meters.[2] [3] This machine, which its inventor called The Dove, may have been suspended on a wire or pivot for its flight.[4] [5] Archytas also wrote some lost works, as he was included by Vitruvius in the list of the twelve authors of works of mechanics.[6] Thomas Winter has suggested that the pseudo-Aristotelian Mechanical Problems is an important mechanical work by Archytas, not lost after all, but misattributed.[7]

Archytas introduced the concept of a harmonic mean, important much later in projective geometry and number theory. According to Eutocius, Archytas solved the problem of doubling the cube in his manner with a geometric construction.[8] Hippocrates of Chios before, reduced this problem to finding mean proportionals. Archytas' theory of proportions is treated in book VIII of Euclid's Elements, where is the construction for two proportional means, equivalent to the extraction of the cube root. According to Diogenes Laertius, this demonstration, which uses lines generated by moving figures to construct the two proportionals between magnitudes, was the first in which geometry was studied with concepts of mechanics.[9] The Archytas curve, which he used in his solution of the doubling the cube problem, is named after him.

Politically and militarily, Archytas appears to have been the dominant figure in Tarentum in his generation, somewhat comparable to Pericles in Athens a half-century earlier. The Tarentines elected him strategos, 'general', seven years in a row – a step that required them to violate their own rule against successive appointments. He was allegedly undefeated as a general, in Tarentine campaigns against their southern Italian neighbors. The Seventh Letter of Plato asserts that Archytas attempted to rescue Plato during his difficulties with Dionysius II of Syracuse. In his public career, Archytas had a reputation for virtue as well as efficacy. Some scholars have argued that Archytas may have served as one model for Plato's philosopher king, and that he influenced Plato's political philosophy as expressed in The Republic and other works (i.e., how does a society obtain good rulers like Archytas, instead of bad ones like Dionysus II?).

Archytas may have drowned in a shipwreck in the sea of Mattinata, where his body lay unburied on the shore until a sailor humanely cast a handful of sand on it. Otherwise, he would have had to wander on this side of the Styx for a hundred years, such the virtue of a little dust, munera pulveris, as Horace calls it in Ode 1.28 on which this information on his death is based. The poem, however, is difficult to interpret and it is not certain that the shipwrecked and Archytas are in fact the same person.

The crater Archytas on the Moon is named in his honour.
The Archytas Curve

The Archytas Curve is created by placing a semicircle (with a diameter of d) on the diameter of one of the two circles of a cylinder (which also has a diameter of d) such that the plane of the semicircle is at right angles to the plane of the circle and then rotating the semicircle about one of its ends in the plane of the cylinder's diameter. This rotation will cut out a portion of the cylinder forming the Archytas Curve.\[10]\n
Another, less mathematical, way of thinking of this construction is that the Archytas Curve is basically the result of cutting out a torus formed by rotating a hemisphere of diameter d out of a cylinder also of diameter d. A cone can go through the same procedures also producing the Archytas Curve. Archytas used his curve to determine the construction of a cube with a volume of half of that of a given cube.

Notes

[5] Automata history (http://automata.co.uk/History page.htm)
    DigitalCommons@University of Nebraska - Lincoln, 2007.
[8] Eutocius, commentary on Archimedes' *On the sphere and cylinder.*
[9] Plato blamed Archytas for his contamination of geometry with mechanics (Plutarch, *Symposiacs*, Book VIII, Question 2 (http://ebooks.adelaide.edu.au/plutarch/symposiacs/chapter8.html#section80)): *And therefore Plato himself dislikes Eudoxus, Archytas, and Menaechmus for endeavoring to bring down the doubling the cube to mechanical operations; for by this means all that was good in geometry would be lost and corrupted, it falling back again to sensible things, and not rising upward and considering immaterial and immortal images, in which God being versed is always God.*

Further reading


External links

• Archytas (http://plato.stanford.edu/entries/archytas) entry by Carl Huffman in the *Stanford Encyclopedia of Philosophy*
• O'Connor, John J.; Robertson, Edmund F., "Archytas" (http://www-history.mcs.st-andrews.ac.uk/Biographies/Archytas.html), *MacTutor History of Mathematics archive*, University of St Andrews.
• Pseudo-Aristotle, *Mechanica* (http://digitalcommons.unl.edu/classicsfacpub/68/) - Greek text and English translation
Heraclitus

Heraclitus of Ephesus (Ancient Greek: Ἡράκλειτος ὁ Ἐφέσιος — Ἡράκλειτος ho Ephésios; c. 535–c. 475 BCE) was a pre-Socratic Greek philosopher, a native of the Greek city Ephesus, Ionia, on the coast of Asia Minor. He was of distinguished parentage. Little is known about his early life and education, but he regarded himself as self-taught and a pioneer of wisdom. From the lonely life he led, and still more from the riddling nature of his philosophy and his contempt for humankind in general, he was called "The Obscure," and the "Weeping Philosopher."

Heraclitus is famous for his doctrine of change being central to the universe, as stated in his famous saying, "You cannot step twice into the same stream." He believed in the unity of opposites, stating that "the path up and down are one and the same," existing things being characterized by pairs of contrary properties, and other explorations of the concept of dualism. His cryptic utterance that "all things come to be in accordance with this Logos," (literally, "word," "reason," or "account") has been the subject of numerous interpretations.
Life

The main source for the life of Heraclitus is Diogenes Laërtius, although some have questioned the validity of his account as "a tissue of Hellenistic anecdotes, most of them obviously fabricated on the basis of statements in the preserved fragments."[1] Diogenes said that Heraclitus flourished in the 69th Olympiad,[2] 504-501 BCE. All the rest of the evidence – the people Heraclitus is said to have known, or the people who were familiar with his work – confirms the floruit. His dates of birth and death are based on a life span of 60 years, the age at which Diogenes says he died,[3] with the floruit in the middle.

Heraclitus was born to an aristocratic family in Ephesus, present-day Efes, Turkey. His father was named either Blosôn or Herakôn.[2] Diogenes says that he abdicated the kingship (basileia) in favor of his brother[4] and Strabo confirms that there was a ruling family in Ephesus descended from the Ionian founder, Androclus, which still kept the title and could sit in the chief seat at the games, as well as a few other privileges.[5] How much power the king had is another question. Ephesus had been part of the Persian Empire since 547 and was ruled by a satrap, a more distant figure, as the Great King allowed the Ionians considerable autonomy. Diogenes says that Heraclitus used to play knucklebones with the youths in the temple of Artemis and when asked to start making laws he refused saying that the constitution (politeia) was ponêra,[6] which can mean either that it was fundamentally wrong or that he considered it toilsome.

With regard to education, Diogenes says that Heraclitus was "wondrous" (thaumasios, which, as Plato explains in the Theaetetus and elsewhere, is the beginning of philosophy) from childhood. Diogenes relates that Sotion said he was a "hearer" of Xenophanes, which contradicts Heraclitus' statement (so says Diogenes) that he had taught himself by questioning himself. Burnet states in any case that "... Xenophanes left Ionia before Herakleitos was born,"[7] Diogenes relates that as a boy Heraclitus had said he "knew nothing" but later claimed to "know everything."[8] His statement that he "heard no one" but "questioned himself," can be placed alongside his statement that "the things that can be seen, heard and learned are what I prize the most."[9]

Diogenes relates that Heraclitus had a poor opinion of human affairs.[2] He believed that Hesiod and Pythagoras lacked understanding though learned[10] and that Homer and Archilochus deserved to be beaten.[11] Laws needed to be defended as though they were city walls.[12] Timon is said to have called him a "mob-reviler." Heraclitus hated the Athenians and his fellow Ephesians, wishing the latter wealth in punishment for their wicked ways.[13] Says Diogenes: "Finally, he became a hater of his kind (misanthrope) and wandered the mountains ... making his diet of grass and herbs."

Heraclitus' life as a philosopher was interrupted by dropsy. The physicians he consulted were unable to prescribe a cure. He treated himself with a liniment of cow manure and baking in the sun, believing that this method would remove the fluid. After a day of treatment he died and was interred in the marketplace.[14]
**Works**

Diogenes states that Heraclitus' work was "a continuous treatise On Nature, but was divided into three discourses, one on the universe, another on politics, and a third on theology." Theophrastus says (in Diogenes) "... some parts of his work are half-finished, while other parts make a strange medley."[^4]

Diogenes also tells us that Heraclitus deposited his book as a dedication in the great temple of Artemis, the Artemisium, one of the largest temples of the 6th century BCE and one of the Seven Wonders of the Ancient World. Ancient temples were regularly used for storing treasures, and were open to private individuals under exceptional circumstances; furthermore, many subsequent philosophers in this period refer to the work. Says Kahn:[^1] "Down to the time of Plutarch and Clement, if not later, the little book of Heraclitus was available in its original form to any reader who chose to seek it out." Diogenes says:[^4] "the book acquired such fame that it produced partisans of his philosophy who were called Heracliteans."

As with other pre-Socratics, his writings only survive in fragments quoted by other authors.

**Ancient characterizations**

**The obscure**

At some time in antiquity he acquired this epithet denoting that his major sayings were difficult to understand. Timon of Phlius calls him "the riddler" (ainiktēs) according to Diogenes Laërtius,[^4] who had just explained that Heraclitus wrote his book "rather unclearly" (asaphesteron) so that only the "capable" should attempt it. By the time of Cicero he had become "the dark" (Ancient Greek ὁ Σκοτεινός — ho Skoteinós)[^15] because he had spoken nimis obscurē, "too obscurely", concerning nature and had done so deliberately in order to be misunderstood. The customary English translation of ὁ Σκοτεινός follows the Latin, "the obscure."

**The weeping philosopher**

Diogenes Laërtius ascribes to Theophrastus the theory that Heraclitus did not complete some of his works because of melancholia.[^4] Later he was referred to as the "weeping philosopher," as opposed to Democritus, who is known as the "laughing philosopher."[^16] If Stobaeus[^17] writes correctly, Sotion in the early 1st century CE was already combining the two in the imaginative duo of weeping and laughing philosophers: "Among the wise, instead of anger, Heraclitus was overtaken by tears, Democritus by laughter." The view is expressed by the satirist Juvenal.[^18]

The first of prayers, best known at all the temples, is mostly for riches .... Seeing this then do you not commend the one sage Democritus for laughing ... and the master of the other school Heraclitus for his tears?

The motif was also adopted by Lucian of Samosata in his "Sale of Creeds," in which the duo is sold together as a complementary product in the satirical auction of philosophers. Subsequently they were considered an indispensable feature of philosophic landscapes. Montaigne proposed two archetypical views of human affairs based on them, selecting Democritus' for himself[^19]. The weeping philosopher makes an appearance in William Shakespeare's The Merchant of Venice.[^20] Donato Bramante painted a fresco, "Democritus and Heraclitus," in Casa Panigarola in Milan.[^21]
Philosophy

Logos

"The idea that all things come to pass in accordance with this Logos"[22] and "the Logos is common,"[23] is expressed in two famous but obscure fragments:

This Logos holds always but humans always prove unable to understand it, both before hearing it and when they have first heard it. For though all things come to be in accordance with this Logos, humans are like the inexperienced when they experience such words and deeds as I set out, distinguishing each in accordance with its nature and saying how it is. But other people fail to notice what they do when awake, just as they forget what they do while asleep. (DK 22B1)

For this reason it is necessary to follow what is common. But although the Logos is common, most people live as if they had their own private understanding. (DK 22B2)

The meaning of Logos also is subject to interpretation: "word", "account", "plan", "formula", "measure", "proportion", "reckoning."[24] Though Heraclitus "quite deliberately plays on the various meanings of logos",[25] there is no compelling reason to suppose that he used it in a special technical sense, significantly different from the way it was used in ordinary Greek of his time.[26]

The later Stoics understood it as "the account which governs everything,"[27] and Hippolytus, in the 3rd century CE, identified it as meaning the Christian Word of God.[28]

Ta Panta rhei, "everything flows"

Τα Πάντα ῥεῖ (ta panta rhei) "everything flows" either was not spoken by Heraclitus or did not survive as a quotation of his. This famous aphorism used to characterize Heraclitus' thought comes from Simplicius,[29] a neoplatonist and Plato's Cratylus. The word rhei, adopted by rhe-o-logy, is the Greek word for "to stream, and to the etymology of Rhea according to Plato's Cratylus."[30]

The philosophy of Heraclitus is summed up in his cryptic utterance:[31]

ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμφαίνουσιν, ἕτερα καὶ ἕτερα ἔδαφα ἐπιρρέει.

Potamoi isin toisin autoisin embainousin, hetera kai hetera hudata eprrei

"Ever-newer waters flow on those who step into the same rivers ."

The quote from Heraclitus appears in Plato's Cratylus twice; in 401,d as:[32]

τὰ ὄντα ἰέναι τε πάντα καὶ μένειν οὐδέν

Ta onta ienai te panta kai menein ouden

"All things move and nothing remains still"

and in 402,a[33]

πάντα χωρεῖ καὶ οὐδέν μένει" καὶ "δις ἐς τὸν αὐτὸν ποταμόν οὐκ ἂν ἐμβαίης"

Panta chorei kai ouden menei ... kai ... dis es ton auton potamou ouk an embaies

"Everything changes and nothing remains still .... and ... you cannot step twice into the same stream"

Instead of "flow" Plato uses chorei, to change chôros.

The assertions of flow are coupled in many fragments with the enigmatic river image:[34]
"Ποταμοῖς τοῖς αὐτοῖς ἐμβαίνομέν τε καὶ οὐκ ἐμβαίνομεν, εἶμέν τε καὶ οὐκ εἶμεν."
"We both step and do not step in the same rivers. We are and are not."

Compare with the Latin adages *Omnia mutantur* and *Tempora mutantur* (8 CE) and the Japanese tale *Hôjôki*, (1200 CE) which contains the same image of the changing river.

**Hodos ano kato, "the way up and the way down"**

In ὁδὸς ἄνω κάτω the structure *anō katō* is more accurately translated as a hyphenated word: "the upward-downward path." They go on simultaneously and instantaneously and result in "hidden harmony".[36] A way is a series of transformations: the πυρὸς τροπαὶ, "turnings of fire,"[37] first into sea, then half of sea to earth and half to rarefied air.

The transformation is a replacement of one element by another: "The death of fire is the birth of air, and the death of air is the birth of water."[38]

This world, which is the same for all, no one of gods or men has made. But it always was and will be: an ever-living fire, with measures of it kindling, and measures going out.[39]

This latter phraseology is further elucidated:

All things are an interchange for fire, and fire for all things, just like goods for gold and gold for goods.[40]

Heraclitus considered fire as the most fundamental element. He believed fire gave rise to the other elements and to all things. He regarded the soul as being a mixture of fire and water, with fire being the noble part of the soul, and water the ignoble part. A soul should therefore aim toward becoming more full of fire and less full of water: a "dry" soul was best. According to Heraclitus, worldly pleasures made the soul "moist", and he considered mastering one's worldly desires to be a noble pursuit which purified the soul's fire.[41] Norman Melchert interpreted Heraclitus as using "fire" metaphorically, in lieu of Logos, as the origin of all things.[42]

**Dike eris, "strife is justice"**

If objects are new from moment to moment so that one can never touch the same object twice, then each object must dissolve and be generated continually momentarily and an object is a harmony between a building up and a tearing down. Heraclitus calls the oppositional processes *eris*, "strife", and hypothesizes that the apparently stable state, *dikê*, or "justice," is a harmony of it:[43]

We must know that war (*polemos*) is common to all and strife is justice, and that all things come into being through strife necessarily.

As Diogenes explains:[44]

All things come into being by conflict of opposites, and the sum of things (*ta hola*, "the whole") flows like a stream.

In the bow metaphor Heraclitus compares the resultant to a strung bow held in shape by an equilibrium of the string tension and spring action of the bow.[45]

There is a harmony in the bending back (*palintropos*) as in the case of the bow and the lyre.
Hephesthai to koino, "follow the common"

People must "follow the common (hepesthai tō ksunō)" and not live having "their own judgement (phonēsis)". He distinguishes between human laws and divine law (tou theiou "of God").

He removes the human sense of justice from his concept of God; i.e., humanity is not the image of God: "To God all things are fair and good and just, but people hold some things wrong and some right." God's custom has wisdom but human custom does not, and yet both humans and God are childish: "human opinions are children's toys" and "Eternity is a child moving counters in a game; the kingly power is a child's."

Wisdom is "to know the thought by which all things are steered through all things", which must not imply that people are or can be wise. Only Zeus is wise. To some degree then Heraclitus seems to be in the mystic's position of urging people to follow God's plan without much of an idea what that may be. In fact there is a note of despair: "The fairest universe (kallistos kosmos) is but a heap of rubbish (sarma, sweepings) piled up (kechumenon, poured out) at random (eikê)."

Influence

Plato

In Heraclitus a perceived object is a harmony between two fundamental units of change, a waxing and a waning. He typically uses the ordinary word "to become" (gignesthai or ginesthai, root sense of being born), which led to his being characterized as the philosopher of becoming rather than of being. He recognizes the changing of objects with the flow of time.

Plato argues against Heraclitus as follows:

How can that be a real thing which is never in the same state? ... for at the moment that the observer approaches, then they become other ... so that you cannot get any further in knowing their nature or state .... but if that which knows and that which is known exist ever ... then I do not think they can resemble a process or flux ....

In Plato one experienced unit is a state, or object existing, which can be observed. The time parameter is set at "ever"; that is, the state is to be presumed present between observations. Change is to be deduced by comparing observations, but no matter how many of those you are able to make, you cannot get through the mysterious gap between them to account for the change that must be occurring there.
Stoics

Stoicism was a philosophical school which flourished between the 3rd century BCE and about the 3rd century CE. It began among the Greeks and became the major philosophy of the Roman Empire before declining with the rise of Christianity in the 3rd century.

Throughout their long tenure the Stoics believed that the major tenets of their philosophy derived from the thought of Heraclitus. According to Long, "the importance of Heraclitus to later Stoics is evident most plainly in Marcus Aurelius." Explicit connections of the earliest Stoics to Heraclitus showing how they arrived at their interpretation are missing but they can be inferred from the Stoic fragments. Long concludes to "modifications of Heraclitus."

The Stoics were interested in Heraclitus' treatment of fire. In addition to seeing it as the most fundamental of the four elements and the one that is quantified and determines the quantity (logos) of the other three, he presents fire as the cosmos, which was not made by any of the gods or men, but "was and is and ever shall be ever-living fire." This is the closest he comes to a substance, but it is an active one altering other things quantitatively and performing an activity Heraclitus describes as "the judging and convicting of all things." It is "the thunderbolt that steers the course of all things." There is no reason to interpret the judgement, which is actually "to separate" (krinein), as outside of the context of "strife is justice" (see subsection above).

The earliest surviving Stoic work, the Hymn to Zeus of Cleanthes, though not explicitly referencing Heraclitus, adopts what appears to be the Heraclitean logos modified. Zeus rules the universe with law (nomos) wielding on its behalf the "forked servant", the "fire" of the "ever-living lightning." So far nothing has been said that differs from the Zeus of Homer. But then, says Cleanthes, Zeus uses the fire to "straighten out the common logos" that travels about (phoitan, "to frequent") mixing with the greater and lesser lights (heavenly bodies). This is Heraclitus' logos, but now it is confused with the "common nomos", which Zeus uses to "make the wrong (perissa, left or odd) right (artia, right or even)" and "order (kosmein) the disordered (akosma)."

The Stoic modification of Heraclitus' idea of the Logos was also influential on Jewish philosophers such as Philo of Alexandria, who connected it to "Wisdom personified" (Sophia) as God's creative principle. Philo uses the term Logos throughout his treatises on Hebrew Scripture in a manner clearly influenced by the Stoics.

Church fathers

The church fathers were the leaders of the Christian church during its first five centuries of existence, roughly contemporaneous to Stoicism under the Roman Empire. The works of dozens of writers in hundreds of pages have survived.

All of them had something to say about the Christian form of the logos. The church found it necessary to discriminate between the Christian logos and that of Heraclitus as part of its ideological distancing from paganism. The necessity to convert by defeating paganism was of paramount importance. Hippolytus of Rome therefore identifies Heraclitus along with the other Pre-Socratics (and Academics) as sources of heresy. Church use of the methods and conclusions of ancient philosophy as such was as yet far in the future, even though many were converted philosophers.

In Refutation of All Heresies, Hippolytus says: "What the blasphemous folly is of Noetus, and that he devoted himself to the tenets of Heraclitus the Obscure, not to those of Christ." Hippolytus then goes on to present the inescrutable DK B67: "God (theos) is day and night, winter and summer, ... but he takes various shapes, just as fire, when it is mingled with spices, is named according to the savor of each." The fragment seems to support pantheism if taken literally.

Hippolytus condemns the obscurity of it. He cannot accuse Heraclitus of being a heretic so he says instead: "Did not (Heraclitus) the Obscure anticipate Noetus in framing a system ...?" The apparent pantheist deity of Heraclitus (if that is what DK B67 means) must be equal to the union of opposites and therefore must be corporeal and
incorporeal, divine and not-divine, dead and alive, etc., and the Trinity can only be reached by some sort of illusory shape-shifting.\[65\]

Notes


[2] Diogenes Laërtius, ix. 1

[3] Diogenes Laërtius, ix. 3

[4] Diogenes Laërtius, ix. 6

[5] Strabo, Chapter 1, section 3.

[6] Diogenes Laërtius, ix. 2


[8] Diogenes Laërtius, ix. 5


[12] DK B44.


[14] Diogenes Laërtius, ix. 4


[17] III.20.53


[27] DK B72, from Marcus Aurelius, *Meditations* iv. 46


[31] DK22B12, quoted in Aria Didymus apud Eusebius, *Praeparatio Evangelica*, 15.20.2


[34] DK B49a, Harris 110. Others like it are DK B12, Harris 20; DK B91, Harris 21.

[35] DK B60


[37] DK B31

[38] DK B76.


[40] DK B90

[41] Russell, Bertrand, *History of Western Philosophy*


[43] DK B80.

[44] Diogenes Laërtius, ix. 8

The initial part of DK B2, often omitted because broken by a note explaining that ksunos (Ionic) is koinos (Attic).


Further reading


**External links**


• Lancereau, M. Daniel; M. Samuel Bérau (2007). "Heraclitus" (http://philoctetes.free.fr/heraclitus.htm). *Philoctetes: ΦΙΛΟΚΤΗΤΗΣ*. Retrieved 2007-10-10. Site with links to pdf's containing the fragments of DK in Greek (Unicode) with the English translations of John Burnet (see Bibliography) and translations into French, either in parallel columns or interlinear, with links on the lexical items to Perseus (http://www.perseus.tufts.edu/) dictionaries. Includes also Heraclitus article from Encyclopædia Britannica Eleventh Edition.

• Magnus, Magus. "The Turning" (http://furniturepressbooks.com/books/magnuspride/).


• "Heraclitus Series" (http://canopycanopycanopy.com/4/heraclitus_series). Heraclitus' fragments rendered into the language of deductive logic on Triple Canopy (online magazine).
Eleatic School

Eleatics

The Eleatics were a school of pre-Socratic philosophers at Elea (now Velia), a Greek colony in Campania, Italy. The group was founded in the early fifth century BCE by Parmenides. Other members of the school included Zeno of Elea and Melissus of Samos. Xenophanes is sometimes included in the list, though there is some dispute over this.

History

The school took its name from Elea, a Greek city of lower Italy, the home of its chief exponents, Parmenides and Zeno. Its foundation is often attributed to Xenophanes of Colophon, but, although there is much in his speculations which formed part of the later Eleatic doctrine, it is probably more correct to regard Parmenides as the founder of the school.

Xenophanes espoused a belief that "God is one, supreme among gods and men, and not like mortals in body or in mind." [Zeller, Vorsokrastische Philosophie, p. 530, n. 3.] Parmenides developed some of Xenophanes's metaphysical ideas. Subsequently, the school debated the possibility of motion and other such fundamental questions. The work of the school was influential upon Platonic metaphysics.

Philosophy

The Eleatics rejected the epistemological validity of sense experience, and instead took logical standards of clarity and necessity to be the criteria of truth. Of the members, Parmenides and Melissus built arguments starting from indubitably sound premises. Zeno, on the other hand, primarily employed the reductio ad absurdum, attempting to destroy the arguments of others by showing their premises led to contradictions (Zeno's paradoxes).

The main doctrines of the Eleatics were evolved in opposition to the theories of the early physicalist philosophers, who explained all existence in terms of primary matter, and to the theory of Heraclitus, which declared that all existence may be summed up as perpetual change. The Eleatics maintained that the true explanation of things lies in the conception of a universal unity of being. According to their doctrine, the senses cannot cognize this unity, because their reports are inconsistent; it is by thought alone that we can pass beyond the false appearances of sense and arrive at the knowledge of being, at the fundamental truth that the All is One. Furthermore, there can be no creation, for being cannot come from non-being, because a thing cannot arise from that which is different from it. They argued that errors on this point commonly arise from the ambiguous use of the verb to be, which may imply existence or be merely the copula which connects subject and predicate.

Though the conclusions of the Eleatics were rejected by the later Presocratics and Aristotle, their arguments were taken seriously, and they are generally credited with improving the standards of discourse and argument in their time. Their influence was likewise longlasting -- Gorgias, a Sophist, argued in the style of the Eleatics in his work "On Nature or What Is Not," and Plato acknowledged them in the Parmenides, the Sophist and the Statesman. Furthermore, much of the later philosophy of the ancient period borrowed from the methods and principles of the Eleatics.
Xenophanes

Xenophanes [1] of Colophon (Ancient Greek: Ξενόφανης ὁ Κολοφώνιος IPA: [ksenopʰɛːns ho kolopʰiːnios]; c. 570 – c. 475 BC) [2] was a Greek philosopher, theologian, poet, and social and religious critic. Knowledge of his views comes from fragments of his poetry, surviving as quotations by later Greek writers. To judge from these, his elegiac and iambic [3] poetry criticized and satirized a wide range of ideas, including Homer and Hesiod, the belief in the pantheon of anthropomorphic gods and the Greeks' veneration of athleticism. He is the earliest Greek poet who claims explicitly to be writing for future generations, creating "fame that will reach all of Greece, and never die while the Greek kind of songs survives." [4]

Philosophy

Xenophanes' surviving writings display a skepticism that became more commonly expressed during the fourth century. He cleverly satirized the polytheistic beliefs of earlier Greek poets and of his own contemporaries: "Homer and Hesiod" one fragment states, "have attributed to the gods all sorts of things that are matters of reproach and censure among men: theft, adultery, and mutual deception." Sextus Empiricus reported that [5] such observations were appreciated by Christian apologists. Xenophanes is quoted, memorably, in Clement of Alexandria, [6] arguing against the conception of gods as fundamentally anthropomorphic:

But if cattle and horses and lions had hands
or could paint with their hands and create works such as men do,
horses like horses and cattle like cattle
also would depict the gods' shapes and make their bodies
of such a sort as the form they themselves have.

...  
Ethiopians say that their gods are snub-nosed and black
Thracians that they are pale and red-haired. [7]

Because of his development of the concept of a "one god greatest among gods and men" that is abstract, universal, unchanging, immobile and always present, Xenophanes is often seen as one of the first monotheists, in the Western philosophy of religion, though this vision is disputed.

Xenophanes concluded from his examination of fossils that water once must have covered all of the Earth's surface. His epistemology, which is still influential today, held that there actually exists a truth of reality, but that humans as mortals are unable to know it. Karl Popper read Xenophanes as saying that it is possible to act only on the basis of working hypotheses - we may act as if we knew the truth, as long as we know that this is extremely unlikely. [8]

Xenophanes' views then might serve as a basis of Critical rationalism.

Until the 1950s, there was some controversy over many aspects of Xenophanes, including whether or not he could be properly characterized as a philosopher. In today's philosophical and classics discourse, Xenophanes is seen as one
of the most important presocratic philosophers. It had also been common since antiquity to see him as the teacher of Zeno of Elea, the colleague of Parmenides, and generally associated with the Eleatic school, but common opinion today is likewise that this is false (see Lesher, p. 102).

There is one fragment dealing with the management of a feast, another which denounces the exaggerated importance attached to athletic victories, and several which deny the humanized gods of Homer.

There are traces of Anaximander's cosmology in the fragments, and Xenophanes may easily have been his disciple before he left Ionia. He maintained there was one greatest god. God is one eternal being, spherical in form, comprehending all things within himself, is intelligent, and moves all things, but bears no resemblance to human nature either in body or mind.

Notes

[2] Internet Encyclopedia of Philosophy
[7] Diels-Kranz, Die Fragmente der Vorsokratiker, Xenophanes frr. 15-16. Many other translations of this passage have Xenophanes state that the Thracians were "blond".

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• K. Jaspers, *The Great Philosophers* 3, New York etc. 1993
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External links

• Xenophanes (http://plato.stanford.edu/entries/xenophanes) entry by James Lesher in the *Stanford Encyclopedia of Philosophy*
• Xenophanes (http://www.iep.utm.edu/x-phanes) entry in the *Internet Encyclopedia of Philosophy*
• Xenophanes of Colophon (http://www.philosophy.gr/presocratics/xenophanes.htm) by Giannis Stamatellos
Parmenides of Elea (Greek: Παρμενίδης ὁ Ἐλεάτης; fl. early 5th century BCE) was an ancient Greek philosopher born in Elea, a Greek city on the southern coast of Italy. He was the founder of the Eleatic school of philosophy. The single known work of Parmenides is a poem, *On Nature*, which has survived only in fragmentary form. In this poem, Parmenides describes two views of reality. In "the way of truth" (a part of the poem), he explains how reality (coined as "what-is") is one, change is impossible, and existence is timeless, uniform, necessary, and unchanging. In "the way of opinion," he explains the world of appearances, in which one's sensory faculties lead to conceptions which are false and deceitful. These ideas strongly influenced the whole of Western philosophy, perhaps most notably through its effect on Plato.

Life

Parmenides was born in the Greek colony of Elea (now Ascea), which, according to Herodotus,[1] had been founded shortly before 535 BCE. He was descended from a wealthy and illustrious family.[2] His dates are uncertain; according to Diogenes Laërtius, he flourished just before 500 BCE,[3] which would put his year of birth near 540 BCE, but Plato has him visiting Athens at the age of 65, when Socrates was a young man, c. 450 BCE,[4] which, if true, suggests a year of birth of c. 515 BCE. He was said to have been a pupil of Xenophanes,[5] and regardless of whether they actually knew each other, Xenophanes' philosophy is the most obvious influence on Parmenides.[6] Diogenes Laërtius also describes Parmenides as a disciple of "Ameinias, son of Diochaites, the Pythagorean"; but there are no obvious Pythagorean elements in his thought. The first hero cult of a philosopher we know of was Parmenides' dedication of a heroon to his teacher Ameinias in Elea.[7] Parmenides was the founder of the School of Elea, which also included Zeno of Elea and Melissus of Samos. Of his life in Elea, it was said that he had written the laws of the city.[8] His most important pupil was Zeno, who according to Plato, was twenty-five years his junior, and was his eromenos.[9] Parmenides had a large influence on Plato, who not only named a dialogue, *Parmenides*, after him, but always spoke of him with veneration.[10]
**On Nature**

Parmenides is one of the most significant of the pre-Socratic philosophers. His only known work, conventionally titled *On Nature*, is a poem, which has only survived in fragmentary form. Approximately 160 lines of the poem remain today; reportedly the original text had 3,000 lines. It is known, however, that the work originally divided into three parts:

- A proem (Greek: προοίμιον), which introduced the entire work,
- A section known as "The Way of Truth" (*aletheia* - ἀλήθεια), and

The proem is a narrative sequence in which the narrator travels "beyond the beaten paths of mortal men" to receive a revelation from an unnamed goddess (generally thought to be Persephone or Dike) on the nature of reality. *Aletheia*, an estimated 90% of which has survived, and *doxa*, most of which no longer exists, are then presented as the spoken revelation of the goddess without any accompanying narrative.

Parmenides attempted to distinguish between the unity of nature and its variety, insisting in the *Way of Truth* upon the reality of its unity, which is therefore the object of knowledge, and upon the unreality of its variety, which is therefore the object, not of knowledge, but of opinion. In the *Way of Opinion* he propounded a theory of the world of seeming and its development, pointing out however that, in accordance with the principles already laid down, these cosmological speculations do not pretend to anything more than mere appearance.

**The Proem**

In the proem, Parmenides describes the journey of a young man from darkness to light. Carried in a whirling chariot, and attended by the daughters of the Sun, the man reaches a temple sacred to an unnamed goddess (variously identified by the commentators with Nature, Wisdom, or Themis), by whom the rest of the proem is spoken. He must learn all things, she tells him, both truth, which is certain, and human opinions; for, though one cannot rely on human opinions, they represent an aspect of the whole truth.
The Way of Truth

The section known as "the way of truth" discusses that which is real, which contrasts in some way with the argument of the section called "the way of opinion," which discusses that which is illusory. Under the "way of truth," Parmenides stated that there are two ways of inquiry: that it is, that it is not. He said that the latter argument is never feasible because nothing can not be:

For never shall this prevail, that things that are not are. (B 7.1)

There are extremely delicate issues here. In the original Greek the two ways are simply named "that Is" (ὅπως ἐστίν) and "that Not-Is" (ὡς οὐκ ἐστίν) (B 2.3 and 2.5) without the "it" inserted in our English translation. In ancient Greek, which, like many languages in the world, does not always require the presence of a subject for a verb, "is" functions as a grammatically complete sentence. Much debate has been focused on where and what the subject is. The simplest explanation as to why there is no subject here is that Parmenides wishes to express the simple, bare fact of existence in his mystical experience without the ordinary distinctions, just as the Latin "pluit" and the Greek huei (ὕει "rains") mean "it rains"; there is no subject for these impersonal verbs because they express the simple fact of raining without specifying what is doing the raining. This is, for instance, Hermann Fraenkel's thesis. Many scholars still reject this explanation and have produced more complex metaphysical explanations. Since existence is an immediately intuited fact, non-existence is the wrong path because a thing cannot disappear, just as something cannot originate from nothing. In such mystical experience (unio mystica), however, the distinction between subject and object disappears along with the distinctions between objects, in addition to the fact that if nothing cannot be, it cannot be the object of thought either:

Thinking and the thought that it is are the same; for you will not find thought apart from what is, in relation to which it is uttered. (B 8.34-36)

For thought and being are the same. (B 3)

It is necessary to speak and to think what is; for being is, but nothing is not. (B 6.1-2)

Helplessness guides the wandering thought in their breasts; they are carried along deaf and blind alike, dazed, beasts without judgment, convinced that to be and not to be are the same and not the same, and that the road of all things is a backward-turning one. (B 6.5-9)

Thus, he concluded that "Is" could not have "come into being" because "nothing comes from nothing". Existence is necessarily eternal. That which truly is [x], has always been [x], and was never becoming [x]; that which is becoming [x] was never nothing (Not-[x]), but will never actually be. Parmenides was not struggling to formulate the conservation of mass-energy; he was struggling with the metaphysics of change, which is still a relevant philosophical topic today.

Moreover he argued that movement was impossible because it requires moving into "the void", and Parmenides identified "the void" with nothing, and therefore (by definition) it does not exist. That which does exist is The Parmenidean One, which is timeless, uniform, and unchanging:

How could what is perish? How could it have come to be? For if it came into being, it is not; nor is it if ever it is going to be. Thus coming into being is extinguished, and destruction unknown. (B 8.20-22)
Nor was [it] once, nor will [it] be, since [it] is, now, all together, / One, continuous; for what coming-to-be of it will you seek? / In what way, whence, did [it] grow? Neither from what-is-not shall I allow / You to say or think; for it is not to be said or thought / That [it] is not. And what need could have impelled it to grow / Later or sooner, if it began from nothing? Thus [it] must either be completely or not at all. (B 8.5-11)

[What exists] is now, all at once, one and continuous... Nor is it divisible, since it is all alike; nor is there any more or less of it in one place which might prevent it from holding together, but all is full of what is. (B 8.5-6, 8.22-24)

And it is all one to me / Where I am to begin; for I shall return there again. (B 5)

Perception vs. Logos

Parmenides claimed that the truth cannot be known through sensory perception. Only Logos will result in the understanding of the truth of the world. This is because the perception of things or appearances (the doxa) is deceptive. Genesis-and-destruction, as Parmenides emphasizes, is illusory, because the underlying material of which a thing is made will still exist after its destruction. What exists must always exist. And we arrive at the knowledge of this underlying, static, and eternal reality (aletheia) through reasoning, not through sense-perception.

For this view, that That Which Is Not exists, can never predominate. You must debar your thought from this way of search, nor let ordinary experience in its variety force you along this way, (namely, that of allowing) the eye, sightless as it is, and the ear, full of sound, and the tongue, to rule; but (you must) judge by means of the Reason (Logos) the much-contested proof which is expounded by me. (B 7.1-8.2)

The Way of Opinion (doxa)

After the exposition of the arche - ἀρχή, i.e. the origin, the necessary part of reality that is understood through reason or logos (that [it] Is), in the next section, the Way of Appearance/Opinion/Seeming, Parmenides proceeds to explain the structure of the becoming cosmos (which is an illusion, of course) that comes from this origin.

The structure of the cosmos is a fundamental binary principle that governs the manifestations of all the particulars: "the aether fire of flame" (B 8.56), which is gentle, mild, soft, thin and clear, and self-identical, and the other is "ignorant night", body thick and heavy.

The mortals lay down and decided well to name two forms (i.e. the flaming light and obscure darkness of night), out of which it is necessary not to make one, and in this they are led astray. (B 8.53-4)

The structure of the cosmos then generated is recollected by Aetius (II, 7, 1):

For Parmenides says that there are circular bands wound round one upon the other, one made of the rare, the other of the dense; and others between these mixed of light and darkness. What surrounds them all is solid like a wall. Beneath it is a fiery band, and what is in the very middle of them all is solid, around which again is a fiery band. The most central of the mixed bands is for them all the origin and cause of motion and becoming, which he also calls steering goddess and keyholder and Justice and Necessity. The air has been separated off from the earth, vapourized by its more violent condensation, and the sun and the circle of the Milky Way are exhalations of fire. The moon is a mixture of both earth and fire. The aether lies around above all else, and beneath it is ranged that fiery part which we call heaven, beneath which are the regions around the earth.\(^{[14]}\)
Interpretations of Parmenides

The traditional interpretation of Parmenides' work is that he argued that the every-day perception of reality of the physical world (as described in doxa) is mistaken, and that the reality of the world is 'One Being' (as described in aletheia): an unchanging, ungenerated, indestructible whole. Under the Way of Opinion, Parmenides set out a contrasting but more conventional view of the world, thereby becoming an early exponent of the duality of appearance and reality. For him and his pupils, the phenomena of movement and change are simply appearances of a static, eternal reality.

Parmenides' philosophy is presented in the form of poetry. The philosophy he argued was, he says, given to him by a goddess, though the "mythological" details in Parmenides' poem do not bear any close correspondence to anything known from traditional Greek mythology:

_Welcome, youth, who come attended by immortal charioteers and mares which bear you on your journey to our dwelling. For it is no evil fate that has set you to travel on this road, far from the beaten paths of men, but right and justice. It is meet that you learn all things - both the unshakable heart of well-rounded truth and the opinions of mortals in which there is not true belief._ (B 1.24-30)

It is with respect to this religious/mystical context that recent generations of scholars such as Alexander P. Mourelatos, Charles H. Kahn, and the controversial Peter Kingsley have begun to call parts of the traditional, rational logical/philosophical interpretation of Parmenides into question (Kingsley in particular stating that Parmenides practiced iatromancy). It has been claimed that previous scholars placed too little emphasis on the apocalyptic context in which Parmenides frames his revelation. As a result, traditional interpretations have put Parmenidean philosophy into a more modern, metaphysical context to which it is not necessarily well suited, which has led to misunderstanding of the true meaning and intention of Parmenides' message. The obscurity and fragmentary state of the text, however, renders almost every claim that can be made about Parmenides extremely contentious, and the traditional interpretation has by no means been abandoned.

Parmenides' considerable influence on the thinking of Plato is undeniable, and in this respect Parmenides has influenced the whole history of Western philosophy, and is often seen as its grandfather. Even Plato himself, in the _Sophist_, refers to the work of "our Father Parmenides" as something to be taken very seriously and treated with respect. In the _Parmenides_, the Eleatic philosopher, which may well be Parmenides himself, and Socrates argue about dialectic. In the _Theaetetus_, Socrates says that Parmenides alone among the wise (Protagoras, Heraclitus, Empedocles, Epicarmus, and Homer) denied that everything is change and motion.

Parmenides is credited with a great deal of influence as the author of an "Eleatic challenge" that determined the course of subsequent philosophers' enquiries. For example, the ideas of Empedocles, Anaxagoras, Leucippus, and Democritus have been seen as in response to Parmenides' arguments and conclusions.\[15\]

Influence on the development of science

Parmenides made the ontological argument against nothingness, essentially denying the possible existence of a void. According to Aristotle, this led Leucippus to propose the atomic theory, which supposes that everything in the universe is either atoms or voids, specifically to contradict Parmenides' argument. Aristotle himself, proclaimed, in opposition to Leucippus, the dictum horror vacui or "nature abhors a vacuum". Aristotle reasoned that in a complete vacuum, motion would encounter no resistance, and thus infinite speed would be possible, something which Aristotle would not accept.

Erwin Schrödinger identified Parmenides' monad of the "Way of Truth" as being the conscious self in "Nature and the Greeks".\[16\] For a discussion of the scientific implications of this view see:Hyman, Anthony, (2007); "The Selfseeker", Teignvalley Press.

A shadow of Parmenides' ideas can be seen in the physical concept of Block time, which considers existence to consist of past, present, and future, and the flow of time to be illusory. In his critique of this idea, Karl Popper
remarked to Einstein “You are Parmenides”.[17]

Notes

[1] Herodotus, i.164
[2] Diogenes Laërtius, ix. 21
[3] Diogenes Laërtius, ix. 23
[5] Aristotle, Metaphysics, i. 5; Sextus Empiricus, adv. Math. vii. 111; Clement of Alexandria, Stromata, i. 301; Diogenes Laërtius, ix. 21
[6] cf. Simplicius, Physics, 22.26-23.20; Hippolytus, i. 14
[9] Plato, Parmenides, 127A: “Zeno and Parmenides once came [to Athens] for the festival of the Great Panathenaea. Parmenides was already a very old man, white-haired but of distinguished appearance - he was about sixty-five. Zeno was then nearly forty, tall and pleasant to look at - he was said to have been Parmenides' lover.”
[15] See e.g. David Sedley, “Parmenides,” in E. Craig (ed.), Routledge Encyclopedia of Philosophy (Routledge, 1998): "Parmenides marks a watershed in Presocratic philosophy. In the next generation he remained the senior voice of Eleatism, perceived as champion of the One against the Many. His One was defended by Zeno of Elea and Melissus, while those who wished to vindicate cosmic plurality and change felt obliged to respond to his challenge. Empedocles, Anaxagoras, Leucippus and Democritus framed their theories in terms which conceded as much as possible to his rejections of literal generation and annihilation and of division."

References and further reading

• Martin Suhr: *Platons Kritik an den Eleaten. Vorschläge zur Interpretation des platonischen Dialogs Parmenides*, Hamburg 1969

Extensive bibliographies are available here (http://presocratics.org/parmenides.htm) and here (http://www.parmenides.com/images/pdfs/Pbib29Apr05online.pdf); annotated bibliography (http://www.ontology.co/parmenides-biblio-one.htm)

**External links**

• Parmenides (http://plato.stanford.edu/entries/parmenides) entry by John Palmer in the *Stanford Encyclopedia of Philosophy*
• "Lecture Notes: Parmenides", S Marc Cohen, University of Washighton (http://faculty.washington.edu/smcohen/320/parm1.htm)
• Parmenides and the Question of Being in Greek Thought (http://www.ontology.co/parmenides.htm) with an annotated bibliography and a list of critical editions
• Parallel text of three translations (two English, one German) (http://parmenides.com/about_parmenides/ParmenidesPoem.html?page=12)
• Parmenides Bilingual Anthology (in Greek and English, side by side) (http://www.ellpos.net/elpenos/greek-texts/ancient-greece/parmenides-being.asp)
• Fragments of Parmenides (http://philoctetes.free.fr/parmenides.htm) parallel Greek with links to Perseus, French, and English (Burnet) includes Parmenides article from Encyclopædia Britannica Eleventh Edition
• Presocratic Fragments and Testimonials adapted from passages in John Burnet's Early Greek Philosophy (1892). (http://pftw.org/index.html#PARMENIDES)
• John Burnet, Early Greek Philosophy, 3rd edition 1920: Chap 4 Parmenides of Elia (http://faculty.evansville.edu/mb2/courses/phil211/burnet/ch4.htm) includes fragments of Parmenides preserved for the most part by Simplicius including *The Way of Belief and the Way of Truth*
Zeno of Elea

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Zeno of Elea (pronounced /ˈziːnoʊ əv 'ɛliə/, Greek: Ζήνων ὁ Ἐλεάτης) (ca. 490 BC? – ca. 430 BC?) was a pre-Socratic Greek philosopher of southern Italy and a member of the Eleatic School founded by Parmenides. Aristotle called him the inventor of the dialectic. He is best known for his paradoxes, which Bertrand Russell has described as "immeasurably subtle and profound".

Life

Little is known for certain about Zeno's life. Although written nearly a century after Zeno's death, the primary source of biographical information about Zeno is the dialogue of Plato called the Parmenides. In the dialogue, Plato describes a visit to Athens by Zeno and Parmenides, at a time when Parmenides is "about 65," Zeno is "nearly 40" (Parmenides 127b) and Socrates is "a very young man" (Parmenides 127c). Assuming an age for Socrates of around 20, and taking the date of Socrates' birth as 469 BC, gives an approximate date of birth for Zeno of 490 BC. ad

Plato says that Zeno was "tall and fair to look upon" and was "in the days of his youth … reported to have been beloved by Parmenides" (Parmenides 127b).

Other perhaps less reliable details of Zeno's life are given by Diogenes Laërtius in his Lives and Opinions of Eminent Philosophers, where it is reported that he was the son of Teleutagoras, but the adopted son of Parmenides, was "skilled to argue both sides of any question, the universal critic," and that he was arrested and perhaps killed at the hands of a tyrant of Elea.

According to Plutarch, Zeno attempted to kill the tyrant Demylus, and failing to do so, "with his own teeth bit off his tongue, he spit it in the tyrant's face."

Works

Although many ancient writers refer to the writings of Zeno, none of his writings survive intact.

Plato says that Zeno's writings were "brought to Athens for the first time on the occasion of" the visit of Zeno and Parmenides (Parmenides 127c). Plato also has Zeno say that this work, "meant to protect the arguments of Parmenides" (Parmenides 128c), was written in Zeno's youth, stolen, and published without his consent (Parmenides 128e). Plato has Socrates paraphrase the "first thesis of the first argument" of Zeno's work as follows: "if being is many, it must be both like and unlike, and this is impossible, for neither can the like be unlike, nor the unlike like" (Parmenides 127d,e).

According to Proclus in his Commentary on Plato's Parmenides, Zeno produced "not less than forty arguments revealing contradictions" (p. 29), but only nine are now known.

Zeno's arguments are perhaps the first examples of a method of proof called reductio ad absurdum, literally meaning to reduce to the absurd. Parmenides is said to be the first individual to implement this style of argument. This form of argument soon became known as the epicheirema (ἐπιχείρημα). In Book VII of his Topica, Aristotle says that an
epicheirema is a dialectical syllogism. It is a connected piece of reasoning which an opponent has put forward as true. The disputant sets out to break down the dialectical syllogism. This destructive method of argument was maintained by him to such a degree that Seneca the Younger commented a few centuries later, If I accede to Parmenides there is nothing left but the One; if I accede to Zeno, not even the One is left.


Zeno's paradoxes

Zeno's paradoxes have puzzled, challenged, influenced, inspired, infuriated, and amused philosophers, mathematicians, and physicists for over two millennia. The most famous are the so-called "arguments against motion" described by Aristotle in his Physics.

Notes

[2] Russell, p. 347: “In this capricious world nothing is more capricious than posthumous fame. One of the most notable victims of posterity’s lack of judgement is the Eleatic Zeno. Having invented four arguments all immeasurably subtle and profound, the grossness of subsequent philosophers pronounced him to be a mere ingenious juggler, and his arguments to be one and all sophisms. After two thousand years of continual refutation, these sophisms were reinstated, and made the foundation of a mathematical renaissance...”
[5] Plutarch, Against Colotes

References

Further reading

- *De compositie van de wereld* Harry Mulisch. (Amsterdam, 1980).

External links

- Zeno of Elea (http://www-history.mcs.st-andrews.ac.uk/Biographies/Zeno_of_Elea.html) - MacTutor
- Plato's *Parmenides* (http://classics.mit.edu/Plato/parmenides.html).

Zeno's paradoxes

Zeno's paradoxes are a set of problems generally thought to have been devised by Zeno of Elea to support Parmenides's doctrine that "all is one" and that, contrary to the evidence of our senses, the belief in plurality and change is mistaken, and in particular that motion is nothing but an illusion. It is usually assumed, based on Plato's *Parmenides* 128c-d, that Zeno took on the project of creating these paradoxes because other philosophers had created paradoxes against Parmenides's view. Thus Zeno can be interpreted as saying that to assume there is plurality is even more absurd than assuming there is only "the One". (*Parmenides* 128d). Plato makes Socrates claim that Zeno and Parmenides were essentially arguing exactly the same point (*Parmenides* 128a-b).

Several of Zeno's nine surviving paradoxes (preserved in Aristotle's *Physics* and Simplicius's commentary thereon) are essentially equivalent to one another; and most of them were regarded, even in ancient times, as very easy to refute. Three of the strongest and most famous—that of Achilles and the tortoise, the Dichotomy argument, and that of an arrow in flight—are presented in detail below.

Zeno's arguments are perhaps the first examples of a method of proof called *reductio ad absurdum* also known as proof by contradiction. They are also credited as a source of the dialectic method used by Socrates. Modern calculus provides a mathematically rigorous basis on Archimedes' solution of Zeno's paradoxes through geometric summation, and similar solutions are considered valid by most natural scientists, but Zeno's paradoxes and their variations (see Thomson's lamp) are still seen as relevant metaphysical problems by many philosophers.

The origins of the paradoxes are somewhat unclear. Diogenes Laertius, a fourth source for information about Zeno and his teachings, citing Favorinus, says that Zeno's teacher Parmenides, was the first to introduce the Achilles and the Tortoise Argument. But in a later passage, Laertius attributes the origin of the paradox to Zeno, explaining that Favorinus disagrees.
The Paradoxes of Motion

Achilles and the tortoise

"In a race, the quickest runner can never overtake the slowest, since the pursuer must first reach the point whence the pursued started, so that the slower must always hold a lead."

—Aristotle, Physics VI:9, 239b15

In the paradox of Achilles and the Tortoise, Achilles is in a footrace with the tortoise. Achilles allows the tortoise a head start of 100 metres. If we suppose that each racer starts running at some constant speed (one very fast and one very slow), then after some finite time, Achilles will have run 100 metres, bringing him to the tortoise's starting point. During this time, the tortoise has run a much shorter distance, say, 10 metres. It will then take Achilles some further time to run that distance, by which time the tortoise will have advanced farther; and then more time still to reach this third point, while the tortoise moves ahead. Thus, whenever Achilles reaches somewhere the tortoise has already been, he still has farther to go. Therefore, because there are an infinite number of points Achilles must reach where the tortoise has already been, he can never overtake the tortoise.\[8\] \[9\]

The dichotomy paradox

"That which is in locomotion must arrive at the half-way stage before it arrives at the goal."

—Aristotle, Physics VI:9, 239b10

Suppose Homer wants to catch a stationary bus. Before he can get there, he must get halfway there. Before he can get halfway there, he must get a quarter of the way there. Before traveling a quarter, he must travel one-eighth; before an eighth, one-sixteenth; and so on.

\[
H - \frac{B}{8} - \frac{B}{4} - \frac{B}{2} - \cdots
\]

The resulting sequence can be represented as:

\[
\{\cdots, \frac{1}{16}, \frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1\}
\]

This description requires one to complete an infinite number of tasks, which Zeno maintains is an impossibility.

This sequence also presents a second problem in that it contains no first distance to run, for any possible (finite) first distance could be divided in half, and hence would not be first after all. Hence, the trip cannot even begin. The paradoxical conclusion then would be that travel over any finite distance can neither be completed nor begun, and so all motion must be an illusion.

This argument is called the Dichotomy because it involves repeatedly splitting a distance into two parts. It contains some of the same elements as the Achilles and the Tortoise paradox, but with a more apparent conclusion of motionlessness. It is also known as the Race Course paradox. Some, like Aristotle, regard the Dichotomy as really just another version of Achilles and the Tortoise.\[10\]
The arrow paradox

"If everything when it occupies an equal space is at rest, and if that which is in locomotion is always occupying such a space at any moment, the flying arrow is therefore motionless.

—Aristotle, Physics VI-9, 239b5

In the arrow paradox (also known as the fletcher's paradox), Zeno states that for motion to occur, an object must change the position which it occupies. He gives an example of an arrow in flight. He states that in any one (durationless) instant of time, the arrow is neither moving to where it is, nor to where it is not. It cannot move to where it is not, because no time elapses for it to move there; it cannot move to where it is, because it is already there. In other words, at every instant of time there is no motion occurring. If everything is motionless at every instant, and time is entirely composed of instants, then motion is impossible. Whereas the first two paradoxes presented divide space, this paradox starts by dividing time—and not into segments, but into points.

Three other paradoxes as given by Aristotle

Paradox of Place:
"... if everything that exists has a place, place too will have a place, and so on ad infinitum."[13]

Paradox of the Grain of Millet:
"... there is no part of the millet that does not make a sound: for there is no reason why any such part should not in any length of time fail to move the air that the whole bushel moves in falling. In fact it does not of itself move even such a quantity of the air as it would move if this part were by itself: for no part even exists otherwise than potentially."[14]

The Moving Rows (or Stadium):
"The fourth argument is that concerning the two rows of bodies, each row being composed of an equal number of bodies of equal size, passing each other on a race-course as they proceed with equal velocity in opposite directions, the one row originally occupying the space between the goal and the middle point of the course and the other that between the middle point and the starting-post. This...involves the conclusion that half a given time is equal to double that time."[15]

For an expanded account of Zeno's arguments as presented by Aristotle, see Simplicius' commentary On Aristotle's Physics.

Proposed solutions

The proposed solutions to Zeno's paradoxes are various, and there is no reason why there cannot be more than one satisfactory solution. The most popular proposed solutions go back to Aristotle and Archimedes.

Aristotle (384 BC–322 BC) remarked that as the distance decreases, the time needed to cover those distances also decreases, so that the time needed also becomes increasingly small.[16] Aristotle's proposed solution for the paradoxes involves distinguishing "things infinite in respect of divisibility" (such as a unit of space that can be mentally divided into ever smaller units while remaining spatially the same) from things (or distances) that are infinite in extension ("with respect to their extremities").[17]

Before 212 BC, Archimedes had developed a method to derive a finite answer for the sum of infinitely many terms that get progressively smaller. (See: Geometric series, 1/4 + 1/16 + 1/64 + 1/256 + ⋯, The Quadrature of the Parabola.) Modern calculus achieves the same result, using more rigorous methods (see convergent series, where the "reciprocals of powers of 2" series, equivalent to the Dichotomy Paradox, is listed as convergent). These methods
allow the construction of solutions based on the conditions stipulated by Zeno, i.e. the amount of time taken at each step is geometrically decreasing.\[3\][18]

Aristotle's objection to the arrow paradox was that "Time is not composed of indivisible nows any more than any other magnitude is composed of indivisibles."[19] Saint Thomas Aquinas, commenting on Aristotle's objection, wrote "Instants are not parts of time, for time is not made up of instants any more than a magnitude is made of points, as we have already proved. Hence it does not follow that a thing is not in motion in a given time, just because it is not in motion in any instant of that time."[20] Bertrand Russell offered what is known as the "at-at theory of motion". It agrees that there can be no motion "during" a durationless instant, and contends that all that is required for motion is that the arrow be at one point at one time, at another point another time, and at appropriate points between those two points for intervening times. In this view motion is a function of position with respect to time.[21][22] Nick Huggett argues that Zeno is begging the question when he says that objects that occupy the same space as they do at rest must be at rest.[12]

Peter Lynds has argued that all of Zeno's motion paradoxes are resolved by the conclusion that instants in time and instantaneous magnitudes do not actually exist.[23][24][25] Lynds argues that an object in relative motion cannot have a determined relative position (for if it did, it could not be in motion), and so cannot have its motion fractionally dissected as though it does as in the paradoxes.

Another proposed solution is to question one of the assumptions of Zeno used in his paradoxes (particularly the Dichotomy), which is that between any two different points in space (or time), there is always another point. Without this assumption there are only a finite number of distances between two points, hence there is no infinite sequence of movements, and the paradox is resolved. According to Hermann Weyl, the assumption that space is made of finite and discrete units is subject to a further problem, given by the "tile argument" or "distance function problem".[26] According to this, the length of the hypotenuse of a right angled triangle in discretized space is always equal to the length of one of the two sides, in contradiction to geometry. Jean Paul van Bendegem has argued that the Tile Argument can be resolved, and that discretization can therefore remove the paradox. [3][27]

Hans Reichenbach has proposed that the paradox may arise from considering space and time as separate entities. In a theory like general relativity, which presumes a single space-time continuum, the paradox may be blocked.[28]

### Archimedes, the conventional solution, and infinite processes

The solution proposed by Archimedes is a proper mathematical treatment of Aristotle's notion that the time it takes to cover the increasingly smaller distances is reduced likewise. Since the paradox is not explicit about the rate of speed at which Achilles catches the tortoise, or how far away he is, we are free to assume that Achilles is catching the tortoise at a constant rate of 1 metre per second, and that he is 1 metre behind the tortoise. Then the time taken to cover each distance, as per Zeno, can be modeled as a sequence and the infinite sum of this sequence is 1/2+1/4+1/8+..., which is equal to 1 (see geometric series for a proof of this fact). According to this model, we can calculate that it will take Achilles exactly 1 second to catch the tortoise.

A stipulation that Achilles is gaining on the tortoise at a constant speed (as a function of time), or something similar, is necessary. There are several reasons for this. For one thing, if Achilles isn't travelling faster than the tortoise, he isn't going to catch it.[May not be relevant] In fact, only the closing speed needs to be known - the absolute speeds of Achilles and the tortoise are irrelevant to the paradox. The tortoise may be stationary as Achilles runs towards it, or it may be that Achilles is stationary at the bottom of a slippery slope, while the tortoise slides helplessly backwards down the slope, towards Achilles.[May not be relevant]

When closing speed is constant, it takes Achilles 1/2 a second to gain 1/2 a metre on the tortoise, 1/4 sec to gain another 1/4 metre, 1/8 sec to gain another 1/8 metre, etc.[clarification needed] If Zeno had mentioned a different situation[May not be relevant] with a different series, for example, where it takes Achilles 1/2 a second to gain 1/2 a metre on the tortoise, 1/3 sec to gain another 1/4 metre, 1/4 sec to gain another 1/8 metre, etc., then Achilles is never going to catch the tortoise (see harmonic series). He will always be catching the tortoise, but at an ever slower rate,
and will get within billionths and trillionths of a centimetre of the tortoise, but will never actually catch it. The subtle
difference between these two situations reflects the subtleties inherent in the mathematics of infinite processes. It is
as unlikely that Zeno was aware of these subtleties as it is unlikely that Zeno possessed a proof of the divergence of
the harmonic series, a result usually credited to Nicole Oresme, a 14th century mathematician based in Paris, France.

It may be objected that in this situation, the motion of Achilles towards the tortoise is not only not constant, but is
not necessarily even continuous (as a function of time). However, it is possible to achieve the same results with the
closing speed of Achilles modelled by a continuous function - see the digamma function. What this shows is that by
itself (assuming the conventional approach/model used here) knowing that Achilles is always moving forward
relative to the tortoise (i.e. catching the tortoise whilst behind, travelling faster whilst level, or pulling away if he is
ahead) does not entail that Achilles will ever catch the tortoise, but that we need to know how fast he is catching the
tortoise. If he is catching it fast enough, he will catch up eventually. If he is catching up too slowly (according to a
function defined for all time), he never will catch up, ever. According to Archimedes and Aristotle, then, if \( f(t) \)
(where \( f(t)>0 \)) is the function modelling Achilles closing speed on the tortoise as a function of time, the apparent
paradox results from either ignoring this function altogether, or assuming that knowing the precise values it takes is
of no relevance to the problem. This is why the constant speed stipulation, or some similar stipulation, is necessary.

The paradoxes in modern times

Infinite processes remained theoretically troublesome in mathematics until the late 19th century. The epsilon-delta
version of Weierstrass and Cauchy developed a rigorous formulation of the logic and calculus involved. These works
resolved the mathematics involving infinite processes.

While mathematics can be used to calculate where and when the moving Achilles will overtake the Tortoise of
Zeno's paradox, philosophers such as Brown and Moorcroft claim that mathematics does not address the central
point in Zeno's argument, and that solving the mathematical issues does not solve every issue the paradoxes raise.

Zeno's arguments are often misrepresented in the popular literature. That is, Zeno is often said to have argued that
the sum of an infinite number of terms must itself be infinite—with the result that both the distance and the time to be
travelled become infinite. However, none of the original ancient sources has Zeno discussing the sum of any infinite
series. Simplicius has Zeno saying "it is impossible to traverse an infinite number of things in a finite time". This
presents Zeno's problem not with finding the sum, but rather with finishing a task with an infinite number of steps:
how can one ever get from A to B, if an infinite number of events can be identified that need to precede the arrival at
B, and one cannot reach even the beginning of a "last event"?

Today there is still a debate on the question of whether or not Zeno's paradoxes have been resolved. In The History
of Mathematics, Burton writes, "Although Zeno's argument confounded his contemporaries, a satisfactory
explanation incorporates a now-familiar idea, the notion of a 'convergent infinite series.' Bertrand Russell offered
a "solution" to the paradoxes based on modern physics, but Brown concludes "Given the history of 'final resolutions',
from Aristotle onwards, it's probably foolhardy to think we've reached the end. It may be that Zeno's arguments on
motion, because of their simplicity and universality, will always serve as a kind of 'Rorschach image' onto which
people can project their most fundamental phenomenological concerns (if they have any)."
The quantum Zeno effect

In 1977, physicists E. C. G. Sudarshan and B. Misra studying quantum mechanics discovered that the dynamical evolution (motion) of a quantum system can be hindered (or even inhibited) through observation of the system. This effect is usually called the "quantum Zeno effect" as it is strongly reminiscent of Zeno's arrow paradox. This effect was first theorized in 1958.

Zeno behavior

In the field of verification and design of timed and hybrid systems, the system behaviour is called Zeno if it includes an infinite number of discrete steps in a finite amount of time. Some formal verification techniques exclude these behaviours from analysis, if they are not equivalent to non-Zeno behaviour. In systems design these behaviours will also often be excluded from system models, since they cannot be implemented with a digital controller. A simple example of a system showing Zeno behavior is the model of a bouncing ball.

Writings about Zeno’s paradoxes

Zeno's paradoxes have inspired many writers:

- Leo Tolstoy in War and Peace (Part 11, Chapter I) discusses the race of Achilles and the tortoise when critiquing "historical science".
- In the dialogue What the Tortoise Said to Achilles, Lewis Carroll describes what happens at the end of the race. The tortoise discusses with Achilles a simple deductive argument. Achilles fails in demonstrating the argument because the tortoise leads him into an infinite regression.
- In Gödel, Escher, Bach by Douglas Hofstadter, the various chapters are separated by dialogues between Achilles and the tortoise, inspired by Lewis Carroll’s works.
- The Argentinian writer Jorge Luis Borges discusses Zeno's paradoxes many times in his work, showing their relationship with infinity. Borges also used Zeno's paradoxes as a metaphor for some situations described by Kafka. Jorge Luis Borges traces, in an essay entitled "Avatars of the Tortoise", the many recurrences of this paradox in works of philosophy. The successive references he traces are Agrippa the Skeptic, Thomas Aquinas, Hermann Lotze, F.H. Bradley and William James.

Notes

2. (fragment 65), Diogenes Laertius. IX (http://classicspersuasion.org/pw/diogenes/dizeno-teleatic.htm) 25ff and VIII 57
References

External links

• Silagadze, Z. K. "Zeno meets modern science, (http://uk.arxiv.org/abs/physics/0505042)"
• Zeno's Paradox: Achilles and the Tortoise (http://demonstrations.wolfram.com/
  ZenosParadoxAchillesAndTheTortoise/) by Jon McLoone, Wolfram Demonstrations Project.
• Kevin Brown on Zeno and the Paradox of Motion (http://www.mathpages.com/rr/s3-07/3-07.htm)

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Melissus

Melissus may refer to:

People:

• Melissus of Samos (fl. c. 500 BCE), Greek philosopher
• Melissus of Thebes, Greek athlete contrasted to Orion by Pindar
• Gaius Maecenas Melissus, (fl. early 1st century), Roman writer

Other:

• Melissus of Crete, mythological figure
Pluralists

Pluralist school

The Pluralist School was a school of pre-Socratic philosophers who attempted to reconcile Parmenides’ rejection of change with the apparently changing world of sense experience. The school consisted of Anaxagoras, Archelaus, and Empedocles. It can also be said to have included the Atomists, Leucippus and Democritus. The Pluralists rejected the idea that the diversity of nature can be reduced to a single principle (monism). Anaxagoras posited that nature contained an innumerable number of principles, while Empedocles reduced nature to four elements (fire, air, earth, and water) which could not be reduced to one another and which would be sufficient to explain change and diversity.
Empedocles (Ancient Greek: Ἐμπεδοκλῆς; Empedoklēs ca. 490–430 BC) was a Greek pre-Socratic philosopher and a citizen of Agrigentum, a Greek city in Sicily. Empedocles' philosophy is best known for being the originator of the cosmogenic theory of the four Classical elements. He also proposed powers called Love and Strife which would act as forces to bring about the mixture and separation of the elements. These physical speculations were part of a history of the universe which also dealt with the origin and development of life. Influenced by the Pythagoreans, he supported the doctrine of reincarnation. Empedocles is generally considered the last Greek philosopher to record his ideas in verse. Some of his work still survives today, more so than in the case of any other Presocratic philosopher. Empedocles' death was mythologized by ancient writers, and has been the subject of a number of literary treatments.
Empedocles was born, c. 490 BC, at Agrigentum (Acragas) in Sicily to a distinguished family.\(^{[1]}\) Very little is known about his life. His father Meto seems to have been instrumental in overthrowing the tyrant of Agrigentum, presumably Thrasydaeus in 470 BC. Empedocles continued the democratic tradition of his house by helping to overthrow the succeeding oligarchic government. He is said to have been magnanimous in his support of the poor;\(^{[2]}\) severe in persecuting the overbearing conduct of the aristocrats;\(^{[3]}\) and he even declined the sovereignty of the city when it was offered to him.\(^{[4]}\)

His brilliant oratory,\(^{[5]}\) his penetrating knowledge of nature, and the reputation of his marvellous powers, including the curing of diseases, and averting epidemics,\(^{[6]}\) produced many myths and stories surrounding his name. He was said to have been a magician and controller of storms, and he himself, in his famous poem *Purifications* seems to have promised miraculous powers, including the destruction of evil, the curing of old age, and the controlling of wind and rain.

Empedocles was acquainted or connected by friendship with the physicians Acron\(^{[7]}\) and Pausanias,\(^{[8]}\) who was his eromenos;\(^{[9]}\) with various Pythagoreans; and even, it is said, with Parmenides and Anaxagoras.\(^{[10]}\) The only pupil of Empedocles who is mentioned is the sophist and rhetorician Gorgias.\(^{[11]}\)

Timaeus and Dicaearchus spoke of the journey of Empedocles to the Peloponnese, and of the admiration which was paid to him there;\(^{[12]}\) others mentioned his stay at Athens, and in the newly-founded colony of Thurii, 446 BC;\(^{[13]}\) there are also fanciful reports of him travelling far to the east to the lands of the Magi.\(^{[14]}\)

According to Aristotle, he died at the age of sixty, (c. 430 BC) even though other writers have him living up to the age of one hundred and nine.\(^{[15]}\) Likewise, there are myths concerning his death: a tradition, which is traced to Heraclides Ponticus, represented him as having been removed from the Earth; whereas others had him perishing in the flames of Mount Etna.\(^{[16]}\)

A contemporary *Life of Empedocles* by Xanthus has been lost.

**Works**

Empedocles is considered the last Greek philosopher to write in verse and the surviving fragments of his teaching are from two poems, *Purifications* and *On Nature*. Empedocles was undoubtedly acquainted with the didactic poems of Xenophanes and Parmenides\(^{[17]}\) - allusions to the latter can be found in the fragments, - but he seems to have surpassed them in the animation and richness of his style, and in the clearness of his descriptions and diction. Aristotle called him the father of rhetoric, and, although he acknowledged only the meter as a point of comparison between the poems of Empedocles and the epics of Homer, he described Empedocles as Homeric and powerful in his diction.\(^{[18]}\) Lucretius speaks of him with enthusiasm, and evidently viewed him as his model.\(^{[19]}\) The two poems together comprised 5000 lines.\(^{[20]}\) About 550 lines of his poetry survive, although because ancient writers rarely mentioned which poem they were quoting, it is not always certain to which poem the quotes belong. Some scholars now believe that there was only one poem, and that the *Purifications* merely formed the beginning of *On Nature*.\(^{[21]}\)
**Purifications**

We possess only about 100 lines of his *Purifications*. It seems to have given a mythical account of the world which may, nevertheless, have been part of Empedocles' philosophical system. The first lines of the poem are preserved by Diogenes Laërtius:

Friends who inhabit the mighty town by tawny Acragas  
which crowns the citadel, caring for good deeds,  
greetings; I, an immortal God, no longer mortal,  
wander among you, honoured by all,  
adorned with holy diadems and blooming garlands.  
To whatever illustrious towns I go,  
I am praised by men and women, and accompanied  
by thousands, who thirst for deliverance,  
some ask for prophecies, and some entreat,  
for remedies against all kinds of disease.\(^{[22]}\)

It was probably this work which contained a story about souls,\(^{[23]}\) where we are told that there were once spirits who lived in a state of bliss, but having committed a crime (the nature of which is unknown) they were punished by being forced to become mortal beings, reincarnated from body to body. Humans, animals, and even plants are such spirits. The moral conduct recommended in the poem may allow us to become like gods again.

**On Nature**

There are about 450 lines of his poem *On Nature* extant, including 70 lines which have been reconstructed from some papyrus scraps known as the *Strasbourg Papyrus*. The poem originally consisted of 2000 lines of hexameter verse,\(^{[24]}\) and was addressed to Pausanias.\(^{[25]}\) It was this poem which outlined his philosophical system. In it, Empedocles explains not only the nature and history of the universe, including his theory of the four classical elements, but he describes theories on causation, perception, and thought, as well as explanations of terrestrial phenomena and biological processes.

**Philosophy**

Although acquainted with the theories of the Eleatics and the Pythagoreans, Empedocles did not belong to any one definite school. An eclectic in his thinking, he combined much that had been suggested by Parmenides, Pythagoras and the Ionian schools. He was both a firm believer in Orphic mysteries, as well as a scientific thinker and a precursor of physical science. Aristotle mentions Empedocles among the Ionic philosophers, and he places him in very close relation to the atomist philosophers and to Anaxagoras.\(^{[26]}\)

Empedocles, like the Ionian philosophers and the atomists, tried to find the basis of all change. They did not, like Heraclitus, consider coming into existence and motion as the existence of things, and rest and tranquillity as the non-existence. This is because they had derived from the Eleatics the conviction that an existence could not pass into non-existence, and vice versa. In order to allow change to occur in the world, against the views of the Eleatics, they viewed changes as the result of mixture and separation of unalterable substances. Thus Empedocles said that a coming into existence from a non-existence, as well as a complete death and annihilation, are impossible; what we call coming into existence and death is only mixture and separation of
what was mixed.\textsuperscript{[27]}

The four elements

It was Empedocles who established four ultimate elements which make all the structures in the world - fire, air, water, earth.\textsuperscript{[28]} Empedocles called these four elements "roots", which, in typical fashion, he also identified with the mythical names of Zeus, Hera, Nestis, and Aidoneus.\textsuperscript{[29]} Empedocles never used the term "element" (Greek: oρωσίων) (stoicheion), which seems to have been first used by Plato.\textsuperscript{[30]} According to the different proportions in which these four indestructible and unchangeable elements are combined with each other the difference of the structure is produced. It is in the aggregation and segregation of elements thus arising, that Empedocles, like the atomists, found the real process which corresponds to what is popularly termed growth, increase or decrease. Nothing new comes or can come into being; the only change that can occur is a change in the juxtaposition of element with element. This theory of the four elements became the standard dogma for the next two thousand years.

Love and Strife

The four elements are, however, simple, eternal, and unalterable, and as change is the consequence of their mixture and separation, it was also necessary to suppose the existence of moving powers - to bring about mixture and separation. The four elements are eternally brought into union, and eternally parted from each other, by two divine powers, Love and Strife. Love (Greek: φιλία) explains the attraction of different forms of matter, and Strife (Greek: νεῖκος) accounts for their separation.\textsuperscript{[31]} If the elements are the content of the universe, then Love and Strife explain their variation and harmony. Love and Strife are attractive and repulsive forces which the ordinary eye can see working amongst people, but which really pervade the universe. They alternately hold empire over things, - neither, however, being ever quite absent.

The sphere of Empedocles

As the best and original state, there was a time when the pure elements and the two powers co-existed in a condition of rest and inertness in the form of a sphere. The elements existed together in their purity, without mixture and separation, and the uniting power of Love predominated in the sphere: the separating power of Strife guarded the extreme edges of the sphere.\textsuperscript{[32]} Since that time, strife gained more sway and the bond which kept the pure elementary substances together in the sphere was dissolved. The elements became the world of phenomena we see today, full of contrasts and oppositions, operated on by both Love and Strife. The sphere being the embodiment of pure existence is the embodiment or representative of god. Empedocles assumed a cyclical universe whereby the elements return and prepare the formation of the sphere for the next period of the universe.

Cosmogony

Since the time of the sphere, Strife has gained more sway; and the actual world is full of contrasts and oppositions, due to the combined action of both principles. Empedocles attempted to explain the separation of elements, the formation of earth and sea, of Sun and Moon, of atmosphere. He also dealt with the first origin of plants and animals, and with the physiology of humans. As the elements entered into combinations, there appeared strange results - heads without necks, arms without shoulders.\textsuperscript{[33]} Then as these fragmentary structures met, there were seen horned heads on human bodies, bodies of oxen with human heads, and figures of double sex.\textsuperscript{[34]} But most of these products of natural forces disappeared as suddenly as they arose; only in those rare cases where the parts were found to be adapted to each other, did the complex structures last. Thus the organic universe sprang from spontaneous aggregations, which suited each other as if this had been intended. Soon various influences reduced the creatures of double sex to a male and a female, and the world was replenished with organic life. It is possible to see this theory as an anticipation of Darwin's theory of natural selection, although Empedocles was not trying to explain evolution.\textsuperscript{[35]}
Empedocles

Empedocles is credited with the first comprehensive theory of light and vision. He put forward the idea that we see objects because light streams out of our eyes and touches them. While flawed in hindsight, this became the fundamental basis on which later Greek philosophers and mathematicians, such as Euclid, would construct some of the most important theories on light, vision and optics.\[36\]

Knowledge is explained by the principle that the elements in the things outside us are perceived by the corresponding elements in ourselves.\[37\] Like is known by like. The whole body is full of pores, (and hence respiration takes place over the whole frame). In the organs of sense these pores are specially adapted to receive the effluences which are continually rising from bodies around us; and in this way perception is explained.\[38\] Thus in vision, certain particles go forth from the eye to meet similar particles given forth from the object, and the resultant contact constitutes vision.\[39\] Perception is not merely a passive reflection of external objects.

Empedocles noted the limitation and narrowness of human perceptions. We see only a part, but fancy that we have grasped the whole. But the senses cannot lead to truth; thought and reflection must look at the thing on every side. It is the business of a philosopher, while laying bare the fundamental difference of elements, to display the identity that exists between what seem unconnected parts of the universe.\[40\]

Respiration

In a famous fragment\[38\] Empedocles attempted to explain the phenomena of respiration by means of an elaborate analogy with the clepsydra, an ancient device for transmitting liquids from one vessel to another.\[41\] This fragment has sometimes been connected to a passage in Aristotle's *Physics* where Aristotle refers to people who twisted wineskins and captured air in clepsydras to demonstrate that void does not exist.\[42\] There is however, no evidence that Empedocles performed any experiment with clepsydras.\[41\] The fragment certainly implies that Empedocles knew about the corporeality of air, but he says nothing whatever about the void.\[41\] The clepsydra was a common utensil and everyone who used it must have known, in some sense, that the invisible air could resist liquid.\[43\]

Reincarnation

Like Pythagoras, Empedocles believed in the transmigration of the soul, that souls can be reincarnated between humans, animals and even plants.\[44\] For Empedocles, all living things were on the same spiritual plane; plants and animals are links in a chain where humans are a link too. Empedocles urged a vegetarian lifestyle, since the bodies of animals are the dwelling places of punished souls.\[45\] Wise people, who have learned the secret of life, are next to the divine,\[46\] and their souls, free from the cycle of reincarnations, are able to rest in happiness for eternity.\[47\]

Death and literary treatments

Diogenes Laërtius records the legend that he died by throwing himself into an active volcano (Mount Etna in Sicily), so that people would believe his body had vanished and he had turned into an immortal god;\[citation with DL numbers needed\] however, the volcano threw back one of his bronze sandals, revealing the deceit. Another legend has it that he threw himself in the volcano to prove to his disciples that he was immortal; he believed he would come back as a god among men after being devoured by the fire.

In *Icaro-Menippus*, a comedic dialogue written by the second century satirist Lucian of Samosata, Empedocles’ final fate is re-evaluated. Rather than being incinerated in the fires of Mount Etna, he was carried up into the heavens by a volcanic eruption. Although a bit singed by the ordeal, Empedocles survives and continues his life on the Moon, surviving by feeding
Empedocles' death has inspired two major modern literary treatments. Empedocles' death is the subject of Friedrich Hölderlin's play *Tod des Empedokles* (*Death of Empedocles*), two versions of which were written between the years 1798 and 1800. A third version was made public in 1826. In Matthew Arnold's poem *Empedocles on Etna*, a narrative of the philosopher's last hours before he jumps to his death in the crater first published in 1852, Empedocles predicts:

> To the elements it came from  
> Everything will return.  
> Our bodies to earth,  
> Our blood to water,  
> Heat to fire,  
> Breath to air.

In 2006, a massive underwater volcano off the coast of Sicily was named Empedocles.\[48\]

**Notes**

[1] Diogenes Laërtius, viii. 51  
[2] Diogenes Laërtius, viii. 73  
[8] Diogenes Laërtius, viii. 60, 61, 65, 69  
[9] Diogenes Laërtius, viii. 60: "Pausanias, according to Aristippus and Satyrus, was his eromenos"  
[10] Suda, *Empedocles*; Diogenes Laërtius, viii. 55, 56, etc.  
[14] Pliny, *H. N.* xxx. 1, etc.  
[19] See especially Lucretius, i. 716, etc.  
[22] Frag. B112, (Diogenes Laërtius, viii. 61)  
[24] Suda, *Empedocles*  
[25] Diogenes Laërtius, viii. 60  
[29] Frag. B6, (Sextus Empiricus, *Against the Mathematicians*, x, 315.)  
[36] *Let There be Light* 7 August 2006 01:50 BBC Four  
Further reading


External links

- Empedocles (http://plato.stanford.edu/entries/empedocles) entry by Richard Parry in the *Stanford Encyclopedia of Philosophy*
- Empedocles (http://www.iep.utm.edu/empedocles) entry in the *Internet Encyclopedia of Philosophy* by Gordon Campbell
- Empedocles of Agrigentum resources (http://www.classicpersuasion.org/pw/empedocles/) at Peithô’s Web
- Empedocles Fragments (http://history.hanover.edu/texts/presoc/emp.htm), translated by Arthur Fairbanks, 1898.
- (http://sites.google.com/site/empedoclesacragas/bibliography-a-z) for an extended and updated bibliography.
- (http://sites.google.com/site/empedoclesacragas/Home) the site dedicated to Empedocles.
Anaxagoras

Anaxagoras

Anaxagoras, part of a fresco in the National University of Athens.

Anaxagoras (Greek: Ἀναξαγόρας, Anaxagoras, "lord of the assembly"; c. 500 BC – 428 BC) was a Pre-Socratic Greek philosopher. Born in Clazomenae in Asia Minor, Anaxagoras was the first philosopher to bring philosophy from Ionia to Athens. He attempted to give a scientific account of eclipses, meteors, rainbows, and the sun, which he described as a fiery mass larger than the Peloponnese. According to Diogenes Laertius and Plutarch he fled to Lampsacus due to a backlash against his pupil Pericles.

Anaxagoras is famous for introducing the cosmological concept of Nous (mind), as an ordering force. He regarded material substance as an infinite multitude of imperishable primary elements, referring all generation and disappearance to mixture and separation respectively.

Biography

Anaxagoras appears to have had some amount of property and prospects of political influence in his native town of Clazomenae in Asia Minor. However, he supposedly surrendered both of these out of a fear that they would hinder his search for knowledge. Valerius Maximus preserves a different tradition: Anaxagoras, coming home from a long voyage, found his property in ruin, and said: "If this had not perished, I would have." "This is a sentence - says the Roman - denoting the most perfect wisdom."[1] Although a Greek, he may have been a soldier of the Persian army when Clazomenae was suppressed during the Ionian Revolt.

In early manhood (c. 464–461 BC) he went to Athens, which was rapidly becoming the centre of Greek culture. There he is said to have remained for thirty years. Pericles learned to love and admire him, and the poet Euripides...
Anaxagoras derived from him an enthusiasm for science and humanity. Anaxagoras brought philosophy and the spirit of scientific inquiry from Ionia to Athens. His observations of the celestial bodies and the fall of meteorites led him to form new theories of the universal order. He attempted to give a scientific account of eclipses, meteors, rainbows, and the sun, which he described as a mass of blazing metal, larger than the Peloponnese. He was the first to explain that the moon shines due to reflected light from the sun. He also said that the moon had mountains and he believed that it was inhabited. The heavenly bodies, he asserted, were masses of stone torn from the earth and ignited by rapid rotation. He explained that though both sun and the stars were fiery stones, we do not feel the heat of the stars because of their enormous distance from earth. He thought that the earth is flat and floats supported by 'strong' air under it and disturbances in this air sometimes causes earthquakes. These speculations made him vulnerable in Athens to a charge of impiety. Diogenes Laerius reports the story that he was prosecuted by Cleon for impiety, but Plutarch says that Pericles sent Anaxagoras to Lampsacus for his own safety after the Athenians began to blame him for the Peloponnesian war.

At about 450 B.C., according to Laertius Pericles spoke in his defense at his trial. Even so Anaxagoras was forced to retire from Athens to Lampsacus in Troad (c. 434–433 BC). He died there in around the year 428 BC. Citizens of Lampsacus erected an altar to Mind and Truth in his memory, and observed the anniversary of his death for many years.

Anaxagoras wrote a book of philosophy, but only fragments of the first part of this have survived, through preservation in work of Simplicius of Cilicia in the sixth century AD.

**Cosmological theory**

All things have existed from the beginning. But originally they existed in infinitesimally small fragments of themselves, endless in number and inextricably combined. All things existed in this mass, but in a confused and indistinguishable form. There were the seeds (spermata) or miniatures of wheat and flesh and gold in the primitive mixture; but these parts, of like nature with their wholes (the homoiomereiai of Aristotle), had to be eliminated from the complex mass before they could receive a definite name and character. Mind arranged the segregation of like from unlike; panta chremata en omou eita nous elthon auta diekosmese. This peculiar thing, called Mind (Nous), was no less illimitable than the chaotic mass, but, unlike the logos of Heraclitus, it stood pure and independent (mounos ef eoutou), a thing of finer texture, alike in all its manifestations and everywhere the same.

This subtle agent, possessed of all knowledge and power, is especially seen ruling in all the forms of life.

Mind causes motion. It rotated the primitive mixture, starting in one corner or point, and gradually extended until it gave distinctness and reality to the aggregates of like parts, working something like a centrifuge, and eventually creating the known cosmos. But even after it had done its best, the original intermixture of things was not wholly overcome. No one thing in the world is ever abruptly separated, as by the blow of an axe, from the rest of things.

It is noteworthy that Aristotle accuses Anaxagoras of failing to differentiate between nous and psyche, while Socrates (Plato, *Phaedo*, 98 B) objects that his nous is merely a deus ex machina to which he refuses to attribute design and knowledge.

Anaxagoras proceeded to give some account of the stages in the process from original chaos to present arrangements. The division into cold mist and warm ether first broke the spell of confusion. With increasing cold, the former gave rise to water, earth and stones. The seeds of life which continued floating in the air were carried down with the rains and produced vegetation. Animals, including man, sprang from the warm and moist clay. If these
things be so, then the evidence of the senses must be held in slight esteem. We seem to see things coming into being and passing from it; but reflection tells us that decease and growth only mean a new aggregation (synkrisis) and disruption (diakrisis). Thus Anaxagoras distrusted the senses, and gave the preference to the conclusions of reflection. Thus he maintained that there must be blackness as well as whiteness in snow; how otherwise could it be turned into dark water?

Anaxagoras marked a turning-point in the history of philosophy. With him speculation passes from the colonies of Greece to settle at Athens. By the theory of minute constituents of things, and his emphasis on mechanical processes in the formation of order, he paved the way for the atomic theory.

Notes

References
• @ This article incorporates text from a publication now in the public domain: Chisholm, Hugh, ed (1911). Encyclopædia Britannica (Eleventh ed.). Cambridge University Press.

Further reading


**External links**

• Anaxagoras (http://plato.stanford.edu/entries/anaxagoras) entry by Patricia Curd in the *Stanford Encyclopedia of Philosophy*

• O'Connor, John J.; Robertson, Edmund F., "Anaxagoras" (http://www-history.mcs.st-andrews.ac.uk/Biographies/Anaxagoras.html), *MacTutor History of Mathematics archive*, University of St Andrews.


• Anaxagoras in English and Greek, Select Online Resources (http://www.ellopos.net/elpenor/greek-texts/ancient-greece/anaxagoras-nous.asp)

• Translation and Commentary (http://www.classicpersuasion.org/pw/burnet/egp.htm?chapter=6#124) from John Burnet's *Early Greek Philosophy*.

Atomists

Atomism

Atomism is a natural philosophy that developed in several ancient traditions. The atomists theorized that the natural world consists of two fundamental principles, atoms (indivisible bodies) and void, (a vacuum, i.e. empty space). Atoms are indestructible and immutable and there are an infinite variety of shapes and sizes. They move through the void, bouncing off each other, sometimes becoming hooked with one or more others to form a cluster. Clusters of different shapes, arrangements, and positions give rise to the various macroscopic substances in the world. (Aristotle, *Metaphysics* I, 4, 985b 10–15).[1] The word atomism derives from the ancient Greek adjective atomos, which literally means 'uncuttable' (a - tomos (not cuttable) – tomos a conjugate of the Greek verb temnein (to cut)). References to the concept of atoms date back to ancient India and ancient Greece. In India the Jain[2][3], Ajivika and Carvaka schools of atomism may date back to the 6th century BCE. [4] The Nyaya and Vaisheshika schools later developed theories on how atoms combined into more complex objects.[5] In the West, the references to atoms emerged in the 5th century BCE with Leucippus, and Democritus.[6] Whether Indian culture influenced Greek or vice versa or whether both evolved independently is a matter of dispute. [7]

Of importance to the philosophical concept of atomism is the historical accident that the particles which chemists and physicists of the early 19th century thought were indivisible, and therefore identified with the uncuttable a-toms of long tradition, were found in the 20th century to be composed of even smaller entities: electrons, neutrons, and protons. Further experiments showed that protons and neutrons are made of quarks. At present, quarks, electrons, and other fundamental particles such as muons, taus, neutrinos, and gauge bosons show no experimental evidence of size or substructure. However, the possibility that they too might be composed of smaller particles cannot be ruled out. Although the connection to historical atomism is at best tenuous, these particles, rather than chemical "atoms", are roughly analogous to the traditional indivisible objects.

Traditional atomism in philosophy

The word atom is understood in primarily two distinct ways: firstly, by the physical sciences; secondly, by philosophy. Atomism is traditionally associated with the latter, the traditional argument of which being that atoms are the basic building blocks of all real, knowable matter, and make up absolutely anything that exists. Atoms are the smallest possible division of matter, do not have physical parts, and cannot be split, cut nor in any way further divided; they are either sizeless (point-sized) or they have a tiny size. Those that have a tiny size are called Democritean atoms. This was the perception in Greek theories of atomism. Indian Buddhists, such as Dharmakirti and others, also contributed to well-developed theories of atomism, and which involve momentary (instantaneous) atoms, that flash in and out of existence. The tradition of atomism leads to the position that only atoms exist, and there are no composite objects (objects with parts), which would mean that human bodies, clouds, planets, and whatnot all do not exist. This consequence of atomism was openly discussed by atomists such as Democritus, Hobbes, and perhaps even Kant (there is a debate over whether or not Kant was an atomist) among others, and it is also called mereological nihilism or metaphysical nihilism. In contemporary philosophy, atomism is not as popular as it has been in past times, because many contemporary philosophers are not willing to argue that only atoms exist, wherein there are not any things like trees, etc. Simples theory is a similar theory to atomism, but where unlike mereological nihilism, philosophers do hold that more than just atoms exist (such as cars and trees made up of the atoms).
**Greek atomism**

**Is there an ultimate, indivisible unit of matter?**

In the 5th century BC, Leucippus and his pupil Democritus proposed that all matter was composed of small indivisible particles called atoms, in order to reconcile two conflicting schools of thought on the nature of reality. On one side was Heraclitus, who believed that the nature of all existence is change. On the other side was Parmenides, who believed instead that all change is illusion.

Parmenides denied the existence of motion, change and void. He believed all existence to be a single, all-encompassing and unchanging mass (a concept known as monism), and that change and motion were mere illusions. This conclusion, as well as the reasoning that lead to it, may indeed seem baffling to the modern empirical mind, but Parmenides explicitly rejected sensory experience as the path to an understanding of the universe, and instead used purely abstract reasoning. Firstly, he believed there is no such thing as void, equating it with non-being (i.e. "if the void is, then it is not nothing; therefore it is not the void"). This in turn meant that motion is impossible, because there is no void to move into. He also wrote all that is must be an indivisible unity, for if it were manifold, then there would have to be a void that could divide it (and he did not believe the void exists). Finally, he stated that the all encompassing Unity is unchanging, for the Unity already encompasses all that is and can be.

Democritus accepted most of Parmenides' arguments, except for the idea that change is an illusion. He believed change was real, and if it was not then at least the illusion had to be explained. He thus supported the concept of void, and stated that the universe is made up of many Parmenidean entities that move around in the void. The void is infinite and provides the space in which the atoms can pack or scatter differently. The different possible packings and scatterings within the void make up the shifting outlines and bulk of the objects that organisms feel, see, eat, hear, smell, and taste. While organisms may feel hot or cold, hot and cold actually have no real existence. They are simply sensations produced in organisms by the different packings and scatterings of the atoms in the void that compose the object that organisms sense as being "hot" or "cold."

The work of Democritus only survives in secondhand reports, some of which are unreliable or conflicting. Much of the best evidence of Democritus' theory of atomism is reported by Aristotle in his discussions of Democritus' and Plato's contrasting views on the types of indivisibles composing the natural world.

**Geometry and atoms**

<table>
<thead>
<tr>
<th>Element</th>
<th>Polyhedron</th>
<th>Number of Faces</th>
<th>Number of Triangles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>Tetrahedron (Animation)</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Air</td>
<td>Octahedron (Animation)</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>Water</td>
<td>Icosahedron (Animation)</td>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>Earth</td>
<td>Cube (Animation)</td>
<td>6</td>
<td>24</td>
</tr>
</tbody>
</table>

Plato (c. 427—c. 347 BC) objected to the mechanistic purposelessness of the atomism of Democritus. He argued that atoms just crashing into other atoms could never produce the beauty and form of the world. In the *Timaeus*, (28B – 29A) Plato insisted that the cosmos was not eternal but was created, although its creator framed it after an eternal, unchanging model.
One part of that creation were the four simple bodies of fire, air, water, and earth. But Plato did not consider these corpuscles to be the most basic level of reality, for in his view they were made up of an unchanging level of reality, which was mathematical. These simple bodies were geometric solids, the faces of which were, in turn, made up of triangles. The square faces of the cube were each made up of four isosceles right-angled triangles and the triangular faces of the tetrahedron, octahedron, and icosahedron were each made up of six right-angled triangles.

He postulated the geometric structure of the simple bodies of the four elements as summarized in the table to the right. The cube, with its flat base and stability, was assigned to earth; the tetrahedron was assigned to fire because its penetrating points and sharp edges made it mobile. The points and edges of the octahedron and icosahedron were blunter and so these less mobile bodies were assigned to air and water. Since the simple bodies could be decomposed into triangles, and the triangles reassembled into atoms of different elements, Plato's model offered a plausible account of changes among the primary substances. [12][13]

The rejection of atoms
Sometime before 330 BC Aristotle asserted that the elements of fire, air, earth, and water were not made of atoms, but were continuous. Aristotle considered the existence of a void, which was required by atomic theories, to violate physical principles. Change took place not by the rearrangement of atoms to make new structures, but by transformation of matter from what it was in potential to a new actuality. (This theory is called hylomorphism.) A piece of wet clay, when acted upon by a potter, takes on its potential to be an actual drinking mug. Aristotle has often been criticized for rejecting atomism, but in ancient Greece the atomic theories of Democritus remained "pure speculations, incapable of being put to any experimental test. Granted that atomism was, in the long run, to prove far more fruitful than any qualitative theory of matter, in the short run the theory that Aristotle proposed must have seemed in some respects more promising". [14][15]

Later ancient atomism
Epicurus (341–270) studied atomism with Nausiphanes who had been a student of Democritus. Although Epicurus was certain of the existence of atoms and the void, he was less sure we could adequately explain specific natural phenomena such as earthquakes, lightning, comets, or the phases of the Moon (Lloyd 1973, 25–6). Few of Epicurus's writings survive and those that do reflect his interest in applying Democritus's theories to assist people in taking responsibility for themselves and for their own happiness—since he held there are no gods around that can help them.

His ideas are also represented in the derivative works of Democritus's followers, such as Lucretius's On the Nature of Things. These derivative works allow us to work out several segments of his theory on how the universe began its current stage. The atoms and the void are eternal. And after collisions that shatter large objects into smaller objects, the resulting dust, still composed of the same eternal atoms as the prior configurations of the universe, falls into a whirling motion that draws the dust into larger objects again to begin another cycle.

Atomism and ethics
Some later philosophers attributed the idea that man created gods; the gods did not create man to Democritus. For example, Sextus Empiricus noted:

Some people think that we arrived at the idea of gods from the remarkable things that happen in the world. Democritus ... says that the people of ancient times were frightened by happenings in the heavens such as thunder, lightning, ..., and thought that they were caused by gods. [16]

Three hundred years after Epicurus, Lucretius in his epic poem On the Nature of Things would depict him as the hero who crushed the monster Religion through educating the people in what was possible in the atoms and what was not possible in the atoms. However, Epicurus expressed a non-aggressive attitude characterized by his statement: "The man who best knows how to meet external threats makes into one family all the creatures he can;
and those he can not, he at any rate does not treat as aliens; and where he finds even this impossible, he avoids all dealings, and, so far as is advantageous, excludes them from his life.” [17]

The exile of atomism

While Aristotelian philosophy eclipsed the importance of the atomists, their work was still preserved and explicated through commentaries on the works of Aristotle. In the 2nd century, Galen (AD 129–216) presented extensive discussions of the Greek atomists, especially Epicurus, in his Aristotle commentaries. According to historian of atomism Joshua Gregory, there was no serious work done with atomism from the time of Galen until Gassendi and Descartes resurrected it in the 17th century; "the gap between these two 'modern naturalists' and the ancient Atomists marked "the exile of the atom" and "it is universally admitted that the Middle Ages had abandoned Atomism, and virtually lost it." However, scholars still had Aristotle's critiques of atomism, and it seems unlikely that all ideas of atomism could have been lost in the West. In the Medieval universities there were rare expressions of atomistic philosophy. For example, in the 14th century Nicholas of Autrecourt considered that matter, space, and time were all made up of indivisible atoms, points, and instants and that all generation and corruption took place by the rearrangement of material atoms. The similarities of his ideas with those of al-Ghazali suggest that Nicholas may have been familiar with Ghazali's work, perhaps through Averroes' refutation of it (Marmara, 1973–74).

Still, "the exile of the atom" is an appropriate description of the interim between the ancient Greeks and the revival of Western atomism in the 16th century, in view of atomism's success elsewhere during that time. If the atom was in exile from the west, it was in India and Islam that atomistic traditions continued.

Indian atomism

The Indian atomistic position, like many movements in Indian Philosophy and Mathematics, starts with an argument from Linguistics. The Vedic etymologist and grammarian Yaska (ca. 7th c. BC) in his Nirukta, in dealing with models for how linguistic structures get to have their meanings, takes the atomistic position that words are the "primary" carrier of meaning – i.e. words have a preferred ontological status in defining meaning. This position was to be the subject of a fierce debate in the Indian tradition from the early Christian era till the 18th century, involving different philosophers from the Nyaya, Mimamsa and Buddhist schools.

In the pratishakhya text (ca. 2nd c. BCE), the gist of the controversy was stated cryptically in the sutra form as "saMhitA pada-prakr^tiH".[18] According to the atomist view, the words (pada) would be the primary elements (prakrti) out of which the sentence is constructed, while the holistic view considers the sentence as the primary entity, originally "given" in its context of utterance, and the words are arrived at only through analysis and abstraction.[19]

These two positions came to be called a-kShaNDa-pakSha (indivisibility or sentence-holism), a position developed later by Bhartrihari (c. 500 AD), vs. kShaNDa-pakSha (atomism), a position adopted by the Mimamsa and Nyaya schools (Note: kShanDa = fragmented; "a-kShanDa" = whole).

Between the 5th and 3rd century BC, the atom (anu or aṇor) is mentioned in the Bhagavad Gita (Chapter 8, Verse 9):

\[ \text{kaviḿ purāṇam anuśāsitāram aṇor aṇīyāḿsam anusmared yaḥ sarvasya dhātāram acintya-rūpam āditya-varṇaḿ tamasaḥ parastāt} \]

One meditates on the omniscient, primordial, the controller, smaller than the atom, yet the maintainer of everything; whose form is inconceivable, resplendent like the sun and totally transcendental to material nature

The ancient "shAshvata-vAda" doctrine of eternalism, which held that elements are eternal, is also suggestive of a possible starting point for atomism (Gangopadhyaya 1981).

There has been some debate among scholars as to the origin of Indian atomism; the general consensus is that the Indian and Greek versions of atomism developed independently. However, there is some doubt on this, given the similarities between Indian atomism and Greek atomism and the proximity of India to scholastic Europe, as well as
Atomism

the account, related by Diogenes Laertius, of Democritus "making acquaintance with the Gymnosophists in India". The atomist position had transcended language into epistemology by the time that Nyaya–Vaisesika, Buddhist and Jaina theology were developing mature philosophical positions.

Will Durant wrote in *Our Oriental Heritage*:

"Two systems of Indian thought propound physical theories suggestively similar to those of Greece. Kanada, founder of the Vaisheshika philosophy, held that the world was composed of atoms as many in kind as the various elements. The Jains more nearly approximated to Democritus by teaching that all atoms were of the same kind, producing different effects by diverse modes of combinations. Kanada believed light and heat to be varieties of the same substance; Udayana taught that all heat comes from the sun; and Vachaspati, like Newton, interpreted light as composed of minute particles emitted by substances and striking the eye."

Indian atomism in the Middle Ages was still mostly philosophical and/or religious in intent, though it was also scientific. Because the "infallible Vedas", the oldest Hindu texts, do not mention atoms (though they do mention elements), atomism was not orthodox in many schools of Hindu philosophy, although accommodationist interpretations or assumptions of lost text justified the use of atomism for non-orthodox schools of Hindu thought. The Buddhist and Jaina schools of atomism however, were more willing to accept the ideas of atomism.

**Nyaya–Vaisesika school**

The Nyaya–Vaisesika school developed one of the earliest forms of atomism; scholars date the Nyaya and Vaisesika texts from the 6th to 1st centuries BC. Like the Buddhist atomists, the Vaisesika had a pseudo-Aristotelian theory of atomism. They posited the four elemental atom types, but in Vaisesika physics atoms had 24 different possible qualities, divided between general extensive properties and specific (intensive) properties. Like the Jaina school, the Nyaya–Vaisesika atomists had elaborate theories of how atoms combine. In both Jaina and Vaisesika atomism, atoms first combine in pairs (dyads), and then group into trios of pairs (triads), which are the smallest visible units of matter.

**Buddhist school**

The Buddhist atomists had very qualitative, Aristotelian-style atomic theory. According to ancient Buddhist atomism, which probably began developing before the 4th century BC, there are four kinds of atoms, corresponding to the standard elements. Each of these elements has a specific property, such as solidity or motion, and performs a specific function in mixtures, such as providing support or causing growth. Like the Hindu Jains, the Buddhists were able to integrate a theory of atomism with their theological presuppositions. Later Indian Buddhist philosophers, such as Dharmakirti and Dignāga, considered atoms to be point-sized, durationless, and made of energy.

**Jaina school**

The most elaborate and well-preserved Indian theory of atomism comes from the philosophy of the Jaina school, dating back to at least the 6th century BC. Some of the Jain texts that refer to matter and atoms are Pancastikayasara, Kalpasutra, Tattvarthasutra and Pannavana Suttam. The Jains envisioned the world as consisting wholly of atoms, except for souls. Paramāṇus or atoms were considered as the basic building blocks of all matter. Their concept of atoms was very similar to classical atomism, differing primarily in the specific properties of atoms. Each atom, according to Jain philosophy, has one kind of taste, one smell, one color, and two kinds of touch, though it is unclear what was meant by "kind of touch". Atoms can exist in one of two states: subtle, in which case they can fit in infinitesimally small spaces, and gross, in which case they have extension and occupy a finite space. Certain characteristics of Paramāṇu correspond with that sub-atomic particles. For example Paramāṇu is characterized by continuous motion either in a straight line or in case of attractions from other Paramāṇus, it follows a curved path. This corresponds with the description of orbit of electrons across the Nucleus. Ultimate particles are also described as particles with positive (Snigdha i.e. smooth charge) and negative (Rūksa – rough) charges that provide them the
binding force. Although atoms are made of the same basic substance, they can combine based on their eternal properties to produce any of six "aggregates", which seem to correspond with the Greek concept of "elements": earth, water, shadow, sense objects, karmic matter, and unfit matter. To the Jains, karma was real, but was a naturalistic, mechanistic phenomenon caused by buildups of subtle karmic matter within the soul. They also had detailed theories of how atoms could combine, react, vibrate, move, and perform other actions, all of which were thoroughly deterministic.

**Islamic atomism**

Atomistic philosophies are found very early in Islamic philosophy, and represent a synthesis of the Greek and Indian ideas. Like both the Greek and Indian versions, Islamic atomism was a charged topic that had the potential for conflict with the prevalent religious orthodoxy, but it was instead more often favoured by orthodox Islamic theologians. It was such a fertile and flexible idea that, as in Greece and India, it flourished in some leading schools of Islamic thought.

**Asharite atomism**

The most successful form of Islamic atomism was in the Asharite school of Islamic theology, most notably in the work of the theologian al-Ghazali (1058–1111). In Asharite atomism, atoms are the only perpetual, material things in existence, and all else in the world is "accidental" meaning something that lasts for only an instant. Nothing accidental can be the cause of anything else, except perception, as it exists for a moment. Contingent events are not subject to natural physical causes, but are the direct result of God's constant intervention, without which nothing could happen. Thus nature is completely dependent on God, which meshes with other Asharite Islamic ideas on causation, or the lack thereof (Gardet 2001). Al-Ghazali also used the theory to support his theory of occasionalism. In a sense, the Asharite theory of atomism has far more in common with Indian atomism than it does with Greek atomism.\(^{22}\)

**Averroism**

Other traditions in Islam rejected the atomism of the Asharites and expounded on many Greek texts, especially those of Aristotle. An active school of philosophers in Spain, including the noted commentator Averroes (AD 1126–1198) explicitly rejected the thought of al-Ghazali and turned to an extensive evaluation of the thought of Aristotle. Averroes commented in detail on most of the works of Aristotle and his commentaries did much to guide the interpretation of Aristotle in later Jewish and Christian scholastic thought.

**Atomic renaissance**

With few exceptions, much of the curriculum in the universities of Europe was based on Aristotle for most of the Middle Ages (Kargon 1966). Scholasticism was standard science in the time of Isaac Newton, but in the 17th century, a renewed interest in Epicurian atomism and Corpuscularianism as a hybrid or an alternative to Aristotelian physics had begun to mount outside the classroom. The main figures in the rebirth of atomism were René Descartes, Pierre Gassendi, and Robert Boyle, as well as other notable figures.

One of the first groups of atomists in England was a cadre of amateur scientists known as the Northumberland circle, led by Henry Percy (1585–1632), the 9th Earl of Northumberland. Although they published little of account, they helped to disseminate atomistic ideas among the burgeoning scientific culture of England, and may have been particularly influential to Francis Bacon, who became an atomist around 1605, though he later rejected some of the claims of atomism. Though they revived the classical form of atomism, this group was among the scientific avant-garde: the Northumberland circle contained nearly half of the confirmed Copernicans prior to 1610 (the year of Galileo's The Starry Messenger). Other influential atomists of late 16th and early 17th centuries include Giordano
Bruno, Thomas Hobbes (who also changed his stance on atomism late in his career), and Thomas Hariot. A number of different atomistic theories were blossoming in France at this time, as well (Clericuzio 2000).

Galileo Galilei (1564–1642) was an advocate of atomism in his 1612, *Discourse on Floating Bodies* (Redondi 1969). In The Assayer, Galileo offered a more complete physical system based on a corpuscular theory of matter, in which all phenomena—with the exception of sound—are produced by "matter in motion". Galileo identified some basic problems with Aristotelian physics through his experiments. He utilized a theory of atomism as a partial replacement, but he was never unequivocally committed to it. For example, his experiments with falling bodies and inclined planes led him to the concepts of circular inertial motion and accelerating free-fall. The current Aristotelian theories of impetus and terrestrial motion were inadequate to explain these. While atomism did not explain the law of fall either, it was a more promising framework in which to develop an explanation because motion was conserved in ancient atomism (unlike Aristotelian physics).

René Descartes' (1596–1650) "mechanical" philosophy of corpuscularism had much in common with atomism, and is considered, in some senses, to be a different version of it. Descartes thought everything physical in the universe to be made of tiny *vortices* of matter. Like the ancient atomists, Descartes claimed that sensations, such as taste or temperature, are caused by the shape and size of tiny pieces of matter. The main difference between atomism and Descartes' concept was the existence of the void. For him, there could be no vacuum, and all matter was constantly swirling to prevent a void as corpuscles moved through other matter. Another key distinction between Descartes' view and classical atomism is the mind/body duality of Descartes, which allowed for an independent realm of existence for thought, soul, and most importantly, God. Gassendi's concept was closer to classical atomism, but with no atheistic overtone.

Pierre Gassendi (1592–1655) was a Catholic priest from France who was also an avid natural philosopher. He was particularly intrigued by the Greek atomists, so he set out to "purify" atomism from its heretical and atheistic philosophical conclusions (Dijksterhuis 1969). Gassendi formulated his atomistic conception of mechanical philosophy partly in response to Descartes; he particularly opposed Descartes' reductionist view that only purely mechanical explanations of physics are valid, as well as the application of geometry to the whole of physics (Clericuzio 2000).

**Corpuscularianism**

Corpuscularianism is similar to atomism, except that where atoms were supposed to be indivisible, corpuscles could in principle be divided. In this manner, for example, it was theorized that mercury could penetrate into metals and modify their inner structure, a step on the way towards transmutative production of gold. Corpuscularianism was associated by its leading proponents with the idea that some of the properties that objects appear to have are artifacts of the perceiving mind: 'secondary' qualities as distinguished from 'primary' qualities.\(^{23}\) Corpuscularianism stayed a dominant theory over the next several hundred years and was blended with alchemy by those such as Robert Boyle and Isaac Newton in the 17th century.\(^{24}\)\(^{25}\) It was used by Newton, for instance, in his development of the corpuscular theory of light. The form that came to be accepted by most English scientists after Robert Boyle (1627–1692) was an amalgam of the systems of Descartes and Gassendi. In The Sceptical Chymist (1661), Boyle demonstrates problems that arise from chemistry, and offers up atomism as a possible explanation. The unifying principle that would eventually lead to the acceptance of a hybrid corpuscular–atomism was mechanical philosophy, which became widely accepted by physical sciences.
**Atomic theory**

By the late 18th century, the useful practices of engineering and technology began to influence philosophical explanations for the composition of matter. Those who speculated on the ultimate nature of matter began to verify their "thought experiments" with some repeatable demonstrations, when they could.

Roger Boscovich provided the first general mathematical theory of atomism, based on the ideas of Newton and Leibniz but transforming them so as to provide a programme for atomic physics. – Lancelot Law Whyte Essay on Atomism, 1961, p 54.

In 1808, John Dalton assimilated the known experimental work of many people to summarize the empirical evidence on the composition of matter. He noticed that distilled water everywhere analyzed to the same elements, hydrogen and oxygen. Similarly, other purified substances decomposed to the same elements in the same proportions by weight.

*Therefore we may conclude that the ultimate particles of all homogeneous bodies are perfectly alike in weight, figure, etc. In other words, every particle of water is like every other particle of water; every particle of hydrogen is like every other particle of hydrogen, etc.*

Furthermore, he concluded that there was a unique atom for each element, using Lavoisier's definition of an element as a substance that could not be analyzed into something simpler. Thus, Dalton concluded the following.

*Chemical analysis and synthesis go no farther than to the separation of particles one from another, and to their reunion. No new creation or destruction of matter is within the reach of chemical agency. We might as well attempt to introduce a new planet into the solar system, or to annihilate one already in existence, as to create or destroy a particle of hydrogen. All the changes we can produce, consist in separating particles that are in a state of cohesion or combination, and joining those that were previously at a distance.*

And then he proceeded to give a list of relative weights in the compositions of several common compounds, summarizing: [26]

1st. *That water is a binary compound of hydrogen and oxygen, and the relative weights of the two elementary atoms are as 1:7, nearly;*

2nd. *That ammonia is a binary compound of hydrogen and azote nitrogen, and the relative weights of the two atoms are as 1:5, nearly...*

Dalton concluded that the fixed proportions of elements by weight suggested that the atoms of one element combined with only a limited number of atoms of the other elements to form the substances that he listed.

**External links**

- Article on traditional Greek atomism [30]
- Atomism from the 17th to the 20th Century [31] at Stanford Encyclopedia of Philosophy [32]
Notes


[23] The Mechanical Philosophy (http://www.vernonpratt.com/conceptualisations/d06bl2_1mechanical.htm) - Early modern 'atomism' ("corpuscularianism" as it was known)


References

Leucippus or Leukippos (Greek: Λεύκιππος, first half of 5th century BC) was one of the earliest Greeks to develop the theory of atomism — the idea that everything is composed entirely of various imperishable, indivisible elements called atoms — which was elaborated in greater detail by his pupil and successor, Democritus. A possible earlier candidate for atomism is Mochus of Sidon, from the Trojan War era (13th or 12th century BCE)\[1\] \[2\] \[3\] He was most likely born in Miletus,\[4\] although Abdera and Elea are also mentioned as possible birth-places.\[5\]

Overview

Leucippus was a shadowy figure, as his dates are not recorded and he is often mentioned in conjunction with his more well-known pupil Democritus, who replaced indeterminism with determinism as the ontological cause of atomic movement. It is therefore difficult to determine which contributions come from Democritus and which come from Leucippus.

In his Corpus Democriteum,\[6\] Thrasyllus of Alexandria, an astrologer and writer living under the emperor Tiberius (14-37 CE) compiled a list of writings traditionally attributed to Democritus to the exclusion of Leucippus.

Leucippus was an Ionian Greek (Ionia, now part of western Turkey), as was Anaxagoras. And he was a contemporary of Zeno of Elea and Empedocles (Magna Graecia, now part of southern Italy). He belonged to the same Ionian School of naturalistic philosophy as Thales, Anaximander, Anaximenes, and he was interested in reality and not idealism as the Italic Eleatics were. Later stories about the influence of Zeno have been questioned by modern studies, also because the ontological conception of being of the Eleatics is static, monistic and deterministic, while Leucippus' is dynamic, pluralistic and indeterministic.

Around 440 or 430 BC Leucippus founded a school at Abdera, which his pupil, Democritus, was closely associated with.\[7\] His fame was so completely overshadowed by that of Democritus, who systematized his views on atoms,
that Epicurus doubted his very existence.\[8\]

However, Aristotle and Theophrastus explicitly credit Leucippus with the invention of Atomism. Leucippus agreed with the Eleatic argument that *true being does not admit of vacuum*, and there can be no movement in the absence of vacuum. Leucippus contended that since movement exists, there has to be vacuum. However, he concludes that vacuum is identified with non-being, since it cannot really be. Leucippus differed from the Eleatics in not being encumbered by the *conceptual intermingling* of being and non-being. Plato made the necessary distinction between *grades of being and types of negation*.\[7\]

The most famous among Leucippus' lost works were titled *Megas Diakosmos* (*The Great Order of the Universe or The great world-system* and is not to confuse with *Micros Diakosmos* (*Little Cosmology*) of Democritus\[9\]) and *Peri Nou* (*On mind*).\[10\]

Fragments and doxographical reports about Leucippus were collected by Hermann Diels (1848–1922), firstly in *Doxographi Graeci* (Berlin, 1879, reprint Berlin: de Gruyter, 1929) and then in *Die Fragmente der Vorsokratiker* (Berlin, 1903, 6th ed., rev. by Walther Kranz (Berlin: Weidmann, 1952; the editions after the 6th are mainly reprints with little or no change.) The probably true fragment of Leucippus is the *Great Cosmology* fragment that says: "The cosmos, then, became like a spherical form in this way: the atoms being submitted to a casual and unpredictable movement, quickly and incessantly." (24, I, 1)

Notes

[4] *The Cambridge Companion to Early Greek Philosophy*, pg. xxiii. Note that Democritus was a resident of Abdera. Some said Leucippus from Elea, perhaps since he was unsuitably associated with the Eleatic philosophers.
[5] *Diogenes Laërtius* says "Leucippus was born at Elea, but some say at Abdera and others at Miletus," *Diogenes Laërtius*, ix. 30. Simplicius refers to him as "Leucippus of Elea or Miletus," *Simplicius, Physica*, 28, 4
[8] *Diogenes Laërtius* x. 7
[9] *The Cambridge Companion to Early Greek Philosophy*, pg. xxiii
[10] Stobaeus, i. 4. 7c

References

• A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (pgs. xxiii, 185)
• *Diels-Kranz, Die Fragmente der Vorsokratiker* [I] 67A
• *Diogenes Laërtius, Lives and Opinions of Eminent Philosophers*, IX.30-33

External links

• Leucippus (http://plato.stanford.edu/entries/leucippus) entry by Sylvia Berryman in the *Stanford Encyclopedia of Philosophy*
**Democritus**

Democritus (Greek: Δημόκριτος, Dēmokritos, "chosen of the people") (ca. 460 BC – ca. 370 BC) was an Ancient Greek philosopher born in Abdera, Thrace, Greece.\(^1\) He was an influential pre-Socratic philosopher and pupil of Leucippus, who formulated an atomic theory for the cosmos.\(^2\)

His exact contributions are difficult to disentangle from his mentor Leucippus, as they are often mentioned together in texts. Their speculation on atoms, taken from Leucippus, bears a passing and partial resemblance to the nineteenth-century understanding of atomic structure that has led some to regard Democritus as more of a scientist than other Greek philosophers; nevertheless their ideas rested on very different bases.\(^3\) Largely ignored in ancient Athens, Democritus was nevertheless well-known to his fellow northern-born philosopher Aristotle. Plato is said to have disliked him so much that he wished all his books burned.\(^1\) Many consider Democritus to be the “father of modern science”.\(^4\)

### Life

Democritus was born in the city of Abdera in Thrace, an Ionian colony of Teos.\(^5\) although some called him a Milesian.\(^6\) He was born in the 80th Olympiad (460–457 BC) according to Apollodorus,\(^7\) and although Thrasyllus placed his birth in 470 BC,\(^7\) the later date is probably more likely.\(^8\) John Burnet has argued that the date of 460 is "too early", since according to Diogenes Laërtius ix.41, Democritus said that he was a “young man (neos)” during Anaxagoras' old age (circa 440–428).\(^9\) It was said that Democritus' father was so wealthy that he received Xerxes on his march through Abdera. Democritus spent the inheritance which his father left him on travels into distant countries, to satisfy his thirst for knowledge. He traveled to Asia, and was even said to have reached India and Ethiopia.\(^10\) We know that he wrote on Babylon and Meroe; he must also have visited Egypt, and Diodorus Siculus states that he lived there for five years.\(^11\) He himself declared\(^12\) that among his contemporaries none had made greater journeys, seen more countries, and met more scholars than himself. He particularly mentions the Egyptian

<table>
<thead>
<tr>
<th><strong>Full name</strong></th>
<th>Democritus</th>
</tr>
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<tbody>
<tr>
<td><strong>Born</strong></td>
<td>ca. 460 BC Abdera, Thrace</td>
</tr>
<tr>
<td><strong>Died</strong></td>
<td>ca. 370 BC (Aged 90)</td>
</tr>
<tr>
<td><strong>Era</strong></td>
<td>Pre-Socratic philosophy</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td>Western Philosophy</td>
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<tr>
<td><strong>School</strong></td>
<td>Pre-Socratic philosophy</td>
</tr>
<tr>
<td><strong>Main interests</strong></td>
<td>metaphysics / mathematics / astronomy</td>
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<tr>
<td><strong>Notable ideas</strong></td>
<td>atomism, distant star theory</td>
</tr>
</tbody>
</table>
mathematicians, whose knowledge he praises. Theophrastus, too, spoke of him as a man who had seen many countries. During his travels, according to Diogenes Laërtius, he became acquainted with the Chaldean magi. A certain "Ostanes", one of the magi accompanying Xerxes was also said to have taught him.

After returning to his native land he occupied himself with natural philosophy. He traveled throughout Greece to acquire a knowledge of its culture. He mentions many Greek philosophers in his writings, and his wealth enabled him to purchase their writings. Leucippus, the founder of the atomism, was the greatest influence upon him. He also praises Anaxagoras. Diogenes Laërtius says that he was friends with Hippocrates. He may have been acquainted with Socrates, but Plato does not mention him and Democritus himself is quoted as saying, "I came to Athens and no one knew me." Aristotle placed him among the pre-Socratic natural philosophers.

The many anecdotes about Democritus, especially in Diogenes Laërtius, attest to his disinterest, modesty, and simplicity, and show that he lived exclusively for his studies. One story has him deliberately blinding himself in order to be less disturbed in his pursuits; it may well be true that he lost his sight in old age. He was cheerful, and was always ready to see the comical side of life, which later writers took to mean that he always laughed at the foolishness of people.

He was highly esteemed by his fellow-citizens, "because," as Diogenes Laërtius says, "he had foretold them some things which events proved to be true," which may refer to his knowledge of natural phenomena. According to Diodorus Siculus, Democritus died at the age of 90, which would put his death around 370 BC, but other writers have him living to 104 or even 109.

Popularly known as the Laughing Philosopher (for laughing at human follies), the terms Abderitan laughter, which means scoffing, incessant laughter, and Abderite, which means a scoffer, are derived from Democritus. To his fellow citizens he was also known as "The Mocker".

**Philosophy and science**

Democritus followed in the tradition of Leucippus, who seems to have come from Miletus, and he carried on the scientific rationalist philosophy associated with that city. They were both strict determinists and thorough materialists, believing everything to be the result of natural laws. Unlike Aristotle or Plato, the atomists attempted to explain the world without reasoning to purpose, prime mover, or final cause. For the atomists questions should be answered with a mechanistic explanation ("What earlier circumstances caused this event?"). While their opponents search for explanations which, in addition to the material and mechanistic, also included the formal and teleological ("What purpose did this event serve?"). Modern science has focused on mechanistic questions, which have led to scientific knowledge, especially in physics, while teleological questions can be useful in biology, in adaptationist reasoning at providing proximate explanations, though the deeper evolutionary explanations are often held to be thoroughly mechanistic. The atomists looked exclusively for mechanistic questions, and only admitted mechanistic answers. Their successors until the Renaissance became occupied with the teleological question, which arguably hindered progress.
Atomic hypothesis

The theory of Democritus and Leucippus held that everything is composed of "atoms", which are physically, but not geometrically, indivisible; that between atoms lies empty space; that atoms are indestructible; have always been, and always will be, in motion; that there are an infinite number of atoms, and kinds of atoms, which differ in shape, and size. Of the mass of atoms, Democritus said "The more any indivisible exceeds, the heavier it is." But his exact position on weight of atoms is disputed.[1]

Leucippus is widely credited with being the first to develop the theory of atomism, although Isaac Newton preferred to credit the obscure Moschus the Phoenician (whom he believed to be the biblical Moses) as the inventor of the idea on the authority of Posidonius and Strabo.[26] The Stanford Encyclopedia of Philosophy notes, "This theologically motivated view does not seem to claim much historical evidence, however."[27]

Democritus, along with Leucippus and Epicurus, proposed the earliest views on the shapes and connectivity of atoms. They reasoned that the solidness of the material corresponded to the shape of the atoms involved. Thus, iron atoms are solid and strong with hooks that lock them into a solid; water atoms are smooth and slippery; salt atoms, because of their taste, are sharp and pointed; and air atoms are light and whirling, pervading all other materials.[28] Democritus was the main proponent of this view. Using analogies from our sense experiences, he gave a picture or an image of an atom that distinguished them from each other by their shape, their size, and the arrangement of their parts. Moreover, connections were explained by material links in which single atoms were supplied with attachments: some with hooks and eyes others with balls and sockets.[29] The Democritean atom is an inert solid (merely excluding other bodies from its volume) that interacts with other atoms mechanically.

In contrast, modern, quantum-mechanical atoms interact via electric and magnetic force fields and are far from inert. The theory of the atomists appears to be more nearly aligned with that of modern science than any other theory of antiquity. However, the similarity with modern concepts of science can be confusing when trying to understand where the hypothesis came from. It is obvious that classical atomists would never have had a solid empirical basis for our modern concepts of atoms and molecules. Russell[30] states that they just hit on a lucky hypothesis, only recently confirmed by evidence.

However Lucretius, describing atomism in his de rerum natura gives very clear and compelling empirical arguments for the original atomist theory. He observes that any material is subject to irreversible decay. Through time, even hard rocks are slowly worn down by drops of water. Things have the tendency to get mixed up: mix water with soil and you get mud, that will usually not un-mix by itself. Wood decays. However, we see in nature and technology that there are mechanisms to recreate 'pure' materials like water, air, metals. The seed of an oak will grow out into an oak tree, made of similar wood as historical oak trees, the wood of which has already decayed. The conclusion is that many properties of materials must derive from something inside, that will itself never decay, something that stores for eternity the same inherent, indivisible properties. The basic question is: why has everything in the world not yet decayed, and how can exactly the same materials, plants, animals be recreated again and again? One obvious solution to explain how indivisible properties can be conveyed in a way not easily visible to human senses, is to hypothesise the existence of 'atoms'. These classical 'atoms' are nearer to our modern concept of 'molecule' than to the atoms of modern science. The other big point of classical atomism is that there must be a lot of open space between these 'atoms': the void. Lucretius gives reasonable arguments that the void is absolutely necessary to explain how gasses and fluids can change shape, flow, while metals can be molded, without changing the basic material properties.
Void hypothesis

The atomistic void hypothesis was a response to the paradoxes of Parmenides and Zeno, the founders of metaphysical logic, who put forth difficult to answer arguments in favor of the idea that there can be no movement. They held that any movement would require a void—which is nothing—but a nothing cannot exist. The Parmenidean position was "You say there 'is' a void; therefore the void is not nothing; therefore there is not the void." The position of Parmenides appeared validated by the observation that where there seems to be nothing there is air, and indeed even where there is not matter there is something, for instance light waves.

The atomists agreed that motion required a void, but simply ignored the argument of Parmenides on the grounds that motion was an observable fact. Therefore, they asserted, there must be a void. This idea survived in a refined version as Newton's theory of absolute space, which met the logical requirements of attributing reality to not-being. Einstein's theory of relativity provided a new answer to Parmenides and Zeno, with the insight that space by itself is relative and cannot be separated from time as part of a generally curved space-time manifold. Consequently, Newton's refinement is now considered superfluous.[31]

Epistemology

The knowledge of truth according to Democritus is difficult, since the perception through the senses is subjective. As from the same senses derive different impressions for each individual, then through the sense-impressions we cannot judge the truth. We can only interpret the sense data through the intellect and grasp the truth, because the truth (aletheia) is at the bottom (en bythoe).

"And again, many of the other animals receive impressions contrary to ours; and even to the senses of each individual, things do not always seem the same. Which then, of these impressions are true and which are false is not obvious; for the one set is no more true than the other, but both are alike. And this is why Democritus, at any rate, says that either there is no truth or to us at least it is not evident."[32]

"Democritus says: By convention hot, by convention cold, but in reality atoms and void, and also in reality we know nothing, since the truth is at bottom."[33]

There are two kinds of knowing, the one he calls "legitimate" (gnesie: genuine) and the other "bastard" (skotie: obscure). The "bastard" knowledge is concerned with the perception through the senses, therefore it is insufficient and subjective. The reason is that the sense-perception is due to the effluences of the atoms (aporroai) from the objects to the senses. When these different shapes of atoms come to us, they stimulate our senses according to their shape, and our sense-impressions arise from those stimulations.[34]

The second sort of knowledge, the "legitimate" one, can be achieved through the intellect, in other words, all the sense-data from the "bastard" must be elaborated through reasoning. In this way one can get away from the false perception of the "bastard" knowledge and grasp the truth through the inductive reasoning. After taking into account the sense-impressions, one can examine the causes of the appearances, draw conclusions about the laws that govern the appearances, and discover the causality (aetiologia) by which they are related. This is the procedure of thought from the parts to the whole or else from the apparent to non-apparent (inductive reasoning). This is one example of why Democritus is considered to be an early scientific thinker. The process is reminiscent of that by which science gathers its conclusions.

"But in the Canons Democritus says there are two kinds of knowing, one through the senses and the other through the intellect. Of these he calls the one through the intellect 'legitimate' attesting its trustworthiness for the judgement of truth, and through the senses he names 'bastard' denying its inerrancy in the discrimination of what is true. To quote his actual words: Of knowledge there are two forms, one legitimate, one bastard. To the bastard belong all this group: sight, hearing, smell, taste, touch. The other is legitimate and separate from that. Then, preferring the legitimate to the bastard, he continues: When the bastard can no longer see any smaller, or hear, or smell, or taste, or perceive by touch, but finer matters have to be examined, then comes the legitimate,
since it has a finer organ of perception.\[35\]

“In the Confirmations ... he says: But we in actuality grasp nothing for certain, but what shifts in accordance with the condition of the body and of the things (atoms) which enter it and press upon it.\[36\]

“Democritus used to say that ‘he prefers to discover a causality rather than become a king of Persia.’\[37\]

**Ethics and politics**

The ethics and politics of Democritus come to us mostly in the form of maxims. He says that "Equality is everywhere noble," but he is not encompassing enough to include women or slaves in this sentiment. Poverty in a democracy is better than prosperity under tyrants, for the same reason one is to prefer liberty over slavery. Those in power should "take it upon themselves to lend to the poor and to aid them and to favor them, then is there pity and no isolation but companionship and mutual defense and concord among the citizens and other good things too many to catalogue." Money when used with sense leads to generosity and charity, while money used in folly leads to a common expense for the whole society— excessive hoarding of money for one's children is avarice. While making money is not useless, he says, doing so as a result of wrong-doing is the "worst of all things." He is on the whole ambivalent towards wealth, and values it much less than self-sufficiency. He disliked violence but was not a pacifist: he urged cities to be prepared for war, and believed that a society had the right to execute a criminal or enemy so long as this did not violate some law, treaty, or oath.\[2\] [31]

Goodness, he believed, came more from practice and discipline than from innate human nature. He believed that one should distance oneself from the wicked, stating that such association increases disposition to vice. Anger, while difficult to control, must be mastered in order for one to be rational. Those who take pleasure from the disasters of their neighbors fail to understand that their fortunes are tied to the society in which they live, and they rob themselves of any joy of their own. He advocated a life of contentment with as little grief as possible, which he said could not be achieved through either idleness or preoccupation with worldly pleasures. Contentment would be gained, he said, through moderation and a measured life; to be content one must set their judgment on the possible and be satisfied with what one has—giving little thought to envy or admiration. Democritus approved of extravagance on occasion, as he held that feasts and celebrations were necessary for joy and relaxation. He considers education to be the noblest of pursuits, but cautioned that learning without sense leads to error.\[2\] [31]

**Mathematics**

Democritus was also a pioneer of mathematics and geometry in particular. We only know this through citations of his works (titled *On Numbers*, *On Geometrics*, *On Tangencies*, *On Mapping*, and *On Irrationals*) in other writings, since most of Democritus' body of work did not survive the Middle Ages. Democritus was among the first to observe that a cone or pyramid has one-third the volume of a cylinder or prism respectively with the same base and height. Also, a cone divided in a plane parallel to its base produces two surfaces. He pointed out that if the two surfaces are commensurate with each other, then the shape of the body would appear to be a cylinder, as it is composed of equal rather than unequal circles. However, if the surfaces are not commensurate, then the side of a cone is not smooth but jagged like a series of steps.\[38\]
Anthropology, biology, and cosmology

His work on nature is known through citations of his books on the subjects, On the Nature of Man, On Flesh (two books), On Mind, On the Senses, On Flavors, On Colors, Causes concerned with Seeds and Plants and Fruits, and Causes concerned with Animals (three books). He spent much of his life experimenting with and examining plants and minerals, and wrote at length on many scientific topics. Democritus thought that the first humans lived an anarchic and animal sort of life, going out to forage individually and living off the most palatable herbs and the fruit which grew wild on the trees. They were driven together into societies for fear of wild animals, he said. He believed that these early people had no language, but that they gradually began to articulate their expressions, establishing symbols for every sort of object, and in this manner came to understand each other. He says that the earliest men lived laboriously, having none of the utilities of life; clothing, houses, fire, domestication, and farming were unknown to them. Democritus presents the early period of mankind as one of learning by trial and error, and says that each step slowly lead to more discoveries; they took refuge in the caves in winter, stored fruits that could be preserved, and through reason and keenness of mind came to build upon each new idea.

Democritus held that the Earth was round, and stated that originally the universe was composed of nothing but tiny atoms churning in chaos, until they collided together to form larger units—including the earth and everything on it. He surmised that there are many worlds, some growing, some decaying; some with no sun or moon, some with several. He held that every world has a beginning and an end, and that a world could be destroyed by collision with another world. His cosmology can be summarized with assistance from Shelley: Worlds rolling over worlds; From creation to decay; Like the bubbles on a river; Sparkling, bursting, borne away.

Works

Ethics

- Pythagoras
- On the Disposition of the Wise Man
- On the Things in Hades
- Tritogenia
- On Manliness or On Virtue
- The Horn of Amaltheia
- On Contentment
- Ethical Commentaries

Natural science

- The Great World-ordering (may have been written by Leucippus)
- Cosmography
- On the Planets
- On Nature
- On the Nature of Man or On Flesh (two books)
- On the Mind
- On the Senses
- On Flavours
- On Colours
- On Different Shapes
- On Changing Shape
- Buttresses
- On Images
- On Logic (three books)
Democritus

Nature
• Heavenly Causes
• Atmospheric Causes
• Terrestrial Causes
• Causes Concerned with Fire and Things in Fire
• Causes Concerned with Sounds
• Causes Concerned with Seeds and Plants and Fruits
• Causes Concerned with Animals (three books)
• Miscellaneous Causes
• On Magnets

Mathematics
• On Different Angles or On contact of Circles and Spheres
• On Geometry
• Geometry
• Numbers
• On Irrational Lines and Solids (two books)
• Planispheres
• On the Great Year or Astronomy (a calendar)
• Contest of the Waterclock
• Description of the Heavens
• Geography
• Description of the Poles
• Description of Rays of Light

Literature
• On the Rhythms and Harmony
• On Poetry
• On the Beauty of Verses
• On Euphonious and Harsh-sounding Letters
• On Homer
• On Song
• On Verbs
• Names

Technical works
• Prognosis
• On Diet
• Medical Judgment
• Causes Concerning Appropriate and Inappropriate Occasions
• On Farming
• On Painting
• Tactics
• Fighting in Armor

Commentaries
• On the Sacred Writings of Babylon
• On Those in Meroe
• Circumnavigation of the Ocean
Democritus

- On History
- Chaldaean Account
- Phrygian Account
- On Fever and Coughing Sicknesses
- Legal Causes
- Problems

Institutes named after Democritus

After Democritus are named the following institutions:

- Democritus University of Thrace
- National Centre of Scientific Research "DEMOKRITOS"

Numismatics

Democritus was depicted on the following contemporary coins/banknotes:


Footnotes

[5] Aristotle, de Coel. iii.4, Meteor. ii.7
[6] Diogenes Laërtius, ix. 34, etc.
[8] "The latter date [460 BC] is perhaps somewhat preferable, especially given the evident temptation to classify Democritus as older than Socrates on generic grounds, i.e. that Democritus was the last 'scientific' philosopher, Socrates the first 'ethical' one." Cynthia Farrar, 1989, The Origins of Democratic Thinking: The Invention of Politics in Classical Athens, page 195. Cambridge University Press
[12] Clement of Alexandria, Stromata, i.
[14] Tatian, Orat. cont. Graec. 17. "However, this Democritus, whom Tatian identified with the philosopher, was a certain Bolus of Mendes who, under the name of Democritus, wrote a book on sympathies and antipathies" – Owsei Temkin (1991), Hippocrates in a World of Pagans and Christians, p.120. JHU Press.
[16] Diogenes Laërtius, ix.42.
[18] Aristotle, Metaph. xiii.4; Phys. ii.2, de Partih. Anim. i.1
[19] Cicero, de Finibus v.29; Aulus Gellius, x.17; Diogenes Laërtius, ix.36; Cicero, Tusculanae Quaestiones v.39.
[20] Seneca, de Ira, ii.10; Aelian, Varia Historia, iv.20.
[21] Diodorus, xiv.11.5.
[22] Lucian, Macrobius 18
References

- **DIODORUS SICULUS** (1st century BC). *Bibliotheca historica*.
- **SEXTUS EMPIRICUS** (ca. 200 CE). *Adversus Mathematicos*. 
External links

- Democritus (http://plato.stanford.edu/entries/democritus) entry by Sylvia Berryman in the Stanford Encyclopedia of Philosophy
- Democritus (http://www.iep.utm.edu/democrit) entry in the Internet Encyclopedia of Philosophy
- O'Connor, John J.; Robertson, Edmund F., "Democritus" (http://www-history.mcs.st-andrews.ac.uk/Biographies/Democritus.html), MacTutor History of Mathematics archive, University of St Andrews.
- Democritus and Leucippus (http://www.thebigview.com/greeks/democritus.html) - thebigview.com
The Sophists

Sophism

Sophism has two different but related meanings: In the modern definition (from Plato), a sophism is a specious argument used for deceiving someone. In Ancient Greece, the sophists were a category of teachers who specialized in using the tools of philosophy and rhetoric for the purpose of teaching aretē — excellence, or virtue — predominantly to young statesmen and nobility. The practice of charging money for education (and providing wisdom only to those who can pay) led to the condemnations made by Plato (through Socrates in his dialogues). Plato regarded their profession itself as being 'specious' or 'deceptive', hence the modern usage of the term.

The term sophism originated from Greek σόφισμα, sophisma, from σοφίζω, sophizo "I am wise"; confer σοφιστής, sophistēs, meaning "wise-ist, one who does wisdom, one who makes a business out of wisdom" and σοφός, sophós means "wise man".

Sophists of Ancient Greece

The Greek word sophos or sophia has had the meaning "wise" or "wisdom" since the time of the poet Homer and originally was used to describe anyone with expertise in a specific domain of knowledge or craft. For example, a charioteer, a sculptor or a warrior could be described as sophoi in their occupations. Gradually, however, the word also came to denote general wisdom and especially wisdom about human affairs (in, for example, politics, ethics, or household management). This was the meaning ascribed to the Greek Seven Sages of 7th and 6th Century BC (like Solon and Thales), and it was the meaning that appeared in the histories of Herodotus. Richard Martin refers to the seven sages as "performers of political poetry."[1]

In the second half of the 5th century BC, particularly at Athens, "sophist" came to denote a class of mostly itinerant intellectuals who taught courses in various subjects, speculated about the nature of language and culture and employed rhetoric to achieve their purposes, generally to persuade or convince others: "Sophists did, however, have one important thing in common: whatever else they did or did not claim to know, they characteristically had a great understanding of what words would entertain or impress or persuade an audience."[1] A few sophists claimed that they could find the answers to all questions. Most of these sophists are known today primarily through the writings of their opponents (specifically Plato and Aristotle), which makes it difficult to assemble an unbiased view of their practices and beliefs.

Many of them taught their skills for a price. Due to the importance of such skills in the litigious social life of Athens, practitioners often commanded very high fees. The sophists' practice of questioning the existence and roles of traditional deities and investigating into the nature of the heavens and the earth prompted a popular reaction against them. The attacks of some of their followers against Socrates prompted a vigorous condemnation from his followers, including Plato and Xenophon, as there was a popular view of Socrates as a sophist[2]. Their attitude, coupled with the wealth garnered by many of the sophists, eventually led to popular resentment against sophist practitioners and the ideas and writings associated with sophism.

Protagoras is generally regarded as the first of the sophists. Others include Gorgias, Prodicus, Hippias, Thrasymachus, Lycophron, Callicles, Antiphon, and Cratylus.

In comparison, Socrates accepted no fee, instead professed a self-effacing posture, which he exemplified by Socratic questioning (i.e. the Socratic method, although Diogenes Laertius wrote that Protagoras—a sophist—invented the "Socratic" method[3][4]). His attitude towards the Sophists was by no means oppositional; in one dialogue Socrates even stated that the Sophists were better educators than he was,[5] which he validated by sending one of his students...
to study under a sophist.\[6\] W. K. C. Guthrie associated Socrates with the Sophists in his *History of Greek Philosophy*.\[6\]

Plato, the most famous student of Socrates, depicts Socrates as refuting some sophists in several *Dialogues*. These texts depict the sophists in an unflattering light, and it is unclear how accurate or fair Plato's representation of them may be; however, Protagoras and Prodicus are portrayed in a largely positive light in Protagoras (dialogue). Another contemporary, the comic playwright Aristophanes, criticizes the sophists as hairsplitting wordsmiths, and makes Socrates their representative.

Plato is largely responsible for the modern view of the "sophist" as a greedy instructor who uses rhetorical sleight-of-hand and ambiguities of language in order to deceive, or to support fallacious reasoning. In this view, the sophist is not concerned with truth and justice, but instead seeks power. Socrates, Plato, and Aristotle all challenged the philosophical foundations of sophism.

Some scholars, such as Ugo Zilioli\[7\] argue that the sophists held a relativistic view on cognition and knowledge. However, this may involve the Greek word "doxa," which means "culturally shared belief" rather than "individual opinion." Their philosophy contains criticism of religion, law, and ethics. Though many sophists were apparently as religious as their contemporaries, some held atheistic or agnostic views (for example, Protagoras and Diagoras of Melos).

In some cases, such as Gorgias, there are original rhetorical works that are fortunately extant, allowing the author to be judged on his own terms. In most cases, however, knowledge of sophist thought comes from fragmentary quotations that lack context. Many of these quotations come from Aristotle, who seems to have held the sophists in slight regard.

Owing largely to the influence of Plato and Aristotle, philosophy came to be regarded as distinct from sophistry, the latter being regarded as specious and rhetorical, a practical discipline. Thus, by the time of the Roman Empire, a sophist was simply a teacher of rhetoric and a popular public speaker. For instance, Libanius, Himerius, Aelius Aristides, and Fronto were sophists in this sense.

**Sophists and democracy**

The sophists' rhetorical techniques were extremely useful for any young nobleman looking for public office. In addition to the individual benefits that Sophistic-style teaching conferred, the societal roles that the Sophists filled had important ramifications for the Athenian political system at large. The historical context in which the Sophists operated provides evidence for their considerable influence, as Athens became more and more democratic during the period in which the Sophists were most active.\[8\]

The Sophists certainly were not directly responsible for Athenian democracy, but their cultural and psychological contributions played an important role in its growth. They contributed to the new democracy in part by espousing expertise in public deliberation, since this was the foundation of decision-making, which allowed and perhaps required a tolerance of the beliefs of others. This liberal attitude would naturally have precipitated into the Athenian assembly as Sophists acquired increasingly high-powered clients.\[9\] Continuous rhetorical training gave the citizens of Athens "the ability to create accounts of communal possibilities through persuasive speech".\[10\] This was extremely important for the democracy, as it gave disparate and sometimes superficially unattractive views a chance to be heard in the Athenian assembly.

In addition, Sophists had great impact on the early development of law, as the sophists were the first lawyers in the world. Their status as lawyers was a result of their extremely developed argumentation skills.\[11\]
Sophists and education

The Sophists were notorious for their claims to teach virtue/excellence and for accepting fees for teaching. The influence of this stance on education in general, and medical education in particular, have been described by Seamus Mac Suibhne.\footnote{Mac Suibhne, Seamus. “Sophists, sophistry, and modern medical education” (http://www.ncbi.nlm.nih.gov/pubmed/20095778). Medical Teacher 2010 Jan;32(1):71-5.}

Modern usage

In modern usage, *sophism*, *sophist*, and *sophistry* are derogatory terms, due to the influence of many past philosophers.

A *sophism* is taken as a specious argument used for deceiving someone. It might be crafted to seem logical while actually being wrong, or it might use difficult words and complicated sentences to intimidate the audience into agreeing, or it might appeal to the audience's prejudices and emotions rather than logic; e.g., raising doubts towards the one asserting, rather than his assertion. The goal of a sophism is often to make the audience believe the writer or speaker to be smarter than he or she actually is; e.g., accusing another of sophistry for using persuasion techniques.

A *sophist* is a user of sophisms, i.e., an insincere person trying to confuse or deceive people. Sophists will try to persuade the audience while paying little attention to whether their argument is logical and factual.

*Sophistry* means making heavy use of sophisms. The word can be applied to a particular text or speech riddled with sophisms.

Notes

\footnote{Plato *Protagoras*, intro by N Denyer, p1, cambridge up, 2008}
\footnote{Aristophanes' "clouds"; Aeschines 1.137; Diels & Kranz, "Die Fragmente der Vorsokratiker", 80 A 21}

References


**External links**

• Plato's Dialogue: Sophist (http://classics.mit.edu/Plato/sophist.html)
Protagoras

Protagoras (Πρωταγόρας) (ca. 490 BC – 420 BC) was a pre-Socratic Greek philosopher and is numbered as one of the sophists by Plato. In his dialogue Protagoras, Plato credits him with having invented the role of the professional sophist or teacher of virtue. He is also believed to have created a major controversy during ancient times through his statement that man is the measure of all things. This idea was very revolutionary for the time and contrasting to other philosophical doctrines that claimed the universe was based on something objective, outside the human influence.

Background

Protagoras was born in Abdera, Thrace, in Ancient Greece. According to Aulus Gellius, he originally made his living as a porter, but one day he was seen by the philosopher Democritus carrying a load of small pieces of wood tied with a short cord. Democritus discovered that Protagoras had tied the load himself with such perfect geometric accuracy that it revealed him to be a mathematic prodigy. He immediately took him into his own household and taught him philosophy.\[2\]

"In Plato's Protagoras, before the company of Socrates, Proclus, and Hippias, he states that he is old enough to be the father of any of them. This suggests a date of not later than 490 BC”. In the Meno (91e) he is said to have died at about the age of 70 after 40 years as a practicing Sophist. His death, then, may be assumed to have occurred circa 420." He was well-known in Athens and became a friend of Pericles.\[3\]

Plutarch relates a story in which the two spend a whole day discussing an interesting point of legal responsibility, that probably involved a more philosophical question of causation.\[4\] “In an athletic contest a man had been accidentally hit and killed with a javelin. Was his death to be attributed to the javelin itself, to the man who threw it, or to the authorities responsible for the conduct of the games?”\[5\]

Philosophy

Protagoras was also renowned as a teacher who addressed subjects connected to virtue and political life. He was especially involved in the question of whether virtue could be taught, a commonplace issue of 5th Century BC Greece (and related to modern readers through Plato's dialogue). Rather than educators who offered specific, practical training in rhetoric or public speaking, Protagoras attempted to formulate a reasoned understanding, on a very general level, of a wide range of human phenomena (for example, language and education). He also seems to have had an interest in the correct use of words (a topic more strongly associated with his fellow-sophist Proclus).
His most famous saying is: "Man is the measure of all things: of things which are, that they are, and of things which are not, that they are not".\[6\] Like many fragments of the Presocratics, this phrase has been passed down to us without any context, and its meaning is open to interpretation. However, the use of the word "χρήματα" instead of the general word "όντα" (entities) signifies that Protagoras was referring to things that are used by or in some way related to humans. This makes a great difference in the meaning of his aphorism. Properties, social entities, ideas, feelings, judgements, etc. are certainly "χρήματα" and hence originate in the human mind. However, Protagoras has never suggested that man must be the measure of the motion of the stars, the growing of plants or the activity of volcanos. Such views (together with his views about the gods) were considered subversive by the contemporary political elites. Like many modern thinkers, Plato ascribes relativism to Protagoras and uses his predecessor's teachings as a foil for his own commitment to objective and transcendent realities and values particularly those that relate to his aristocratic background. His major effort (though the words of Socrates) is to convince his contemporaries that virtue ("αρετή") is a present from the gods, which one either has or has not and that no sophist can teach virtue to people that do not already possess it. Plato ascribes to Protagoras an early form of phenomenalism,\[7\] in which what is or appears for a single individual is true or real for that individual. However, as it is clearly presented in the dialogue "Theaetetus", Protagoras explains that some of such controversial views may result from an ill body or mind. He stresses that although all views may appear equally true (and perhaps should be equally respected) they are certainly not of equal gravity. One may be useful and advantageous to the person that has it while another may prove harmful. Hence, the sophist is there to teach the student how to discriminate between them, i.e to teach virtue.

Protagoras was a proponent of agnosticism. In his lost work, On the Gods, he wrote: "Concerning the gods, I have no means of knowing whether they exist or not or of what sort they may be, because of the obscurity of the subject, and the brevity of human life."\[8\] (80B4 DK)

Very few fragments from Protagoras have survived, though he is known to have written several different works: Antilogiae and Truth. The latter is cited by Plato, and was known alternatively as 'The Throws' (a wrestling term referring to the attempt to floor an opponent). It began with the "man the measure" pronouncement. The crater Protagoras on the Moon is named in his honor.

**Book Burning story**

According to Diogenes Laërtius, the above outspoken agnostic position taken by Protagoras aroused anger, causing the Athenians to expel him from the city, and all copies of the book were collected and burned in the marketplace; this is also mentioned by Cicero\[9\]. However, the Classicist John Burnet doubts this account, as both Diogenes Laertius and Cicero wrote hundreds of years later and no such persecution of Protagoras is mentioned by contemporaries who make extensive references to this philosopher\[10\]. Burnet notes that even if some copies of Protagoras' book were burned, enough of them survived to be known and discussed in the following century.

**Notes**

[6] (80B1 DK). This quotation is recapitulated in Plato's Theaetetus, section 152a. (http://www.perseus.tufts.edu/cgi-bin/ptext?lookup=Plat.+Theaet.+152a) Sextus Empiricus (Adv. math. 7.60) gives a direct quotation, πάντων χρημάτων μέτρον ἐστίν ἄνθρωπος, τῶν μὲν ἄνθρωπον ως ἄνθρωπον, τῶν δὲ οὐκ ἄνθρωπον ως οὐκ ἄνθρωπον. The translation "Man is the measure..." has been familiar in English since before the rise of gender-neutral language; in Greek, Protagoras makes a general statement, not about men, but about human beings (his word is anthropos).
Protagoras (c. 490 - c. 420 BCE) (http://www.iep.utm.edu/p/protagor.htm), Accessed: October 6, 2008. "While the pious might wish to look to the gods to provide absolute moral guidance in the relativistic universe of the Sophistic Enlightenment, that certainty also was cast into doubt by philosophic and sophistic thinkers, who pointed out the absurdity and immorality of the conventional epic accounts of the gods. Protagoras' prose treatise about the gods began "Concerning the gods, I have no means of knowing whether they exist or not or of what sort they may be. Many things prevent knowledge including the obscurity of the subject and the brevity of human life."

References


External links

- Protagoras (http://www.iep.utm.edu/protagor) entry in the Internet Encyclopedia of Philosophy by Carol Poster

Gorgias

Gorgias (Greek: Γοργίας, c. 485-c. 380 BC) "the Nihilist", Greek sophist, pre-socratic philosopher and rhetorician, was a native of Leontini in Sicily. Along with Protagoras, he forms the first generation of Sophists. Several doxographers report that he was a pupil of Empedocles, although he would only have been a few years younger. "Like other Sophists he was an itinerant, practicing in various cities and giving public exhibitions of his skill at the great pan-Hellenic centers of Olympia and Delphi, and charged fees for his instruction and performances. A special feature of his displays was to invite miscellaneous questions from the audience and give impromptu replies."

His chief claim to recognition resides in the fact that he transplanted rhetoric from his native Sicily to Attica, and contributed to the diffusion of the Attic dialect as the language of literary prose.

Life

Gorgias originated from Leontini, a Greek colony in Sicily, and what is often called the home of Spartan rhetoric. It is known that Gorgias had a father named Charmantides and two siblings – a brother named Herodicus and a sister who dedicated a statue to Gorgias in Delphi (McComiskey 6-7).

He was already about sixty when in 427 he was sent to Athens by his fellow-citizens at the head of an embassy to ask for Athenian protection against the aggression of the Syracusans. He subsequently settled in Athens, probably due to the enormous popularity of his style of oratory and the profits made from his performances and rhetoric classes. According to Aristotle, his students included Isocrates. (Other students are named in later traditions; the Suda adds Pericles, Polus, and Alcidamas, Diogenes Laërtius mentions Antisthenes, and according to Philostratus, "I understand that he attracted the attention of the most admired men, Critias and Alcibiades who were young, and Thucydides and Pericles who were already old. Agathon too, the tragic poet, whom Comedy regards as wise and eloquent, often Gorgianizes in his iambic verse").

Gorgias is reputed to have lived to be over one hundred years old. He accumulated considerable wealth; enough to commission a gold statue of himself for a public temple. He died at Larissa in Thessaly.
Rhetorical innovation

Gorgias ushered in rhetorical innovations involving structure and ornamentation and the introduction of *paradoxologia* – the idea of paradoxical thought and paradoxical expression. For these advancements, Gorgias has been labeled the ‘father of sophistry’ (Wardy 6). Gorgias is also known for contributing to the diffusion of the Attic dialect as the language of literary prose.

Gorgias’ extant rhetorical works (*Encomium of Helen, Defense of Palamedes, On Non-Existence, and Epitaphios*) come to us via a work entitled *Technai*, a manual of rhetorical instruction, which may have consisted of models to be memorized and demonstrate various principles of rhetorical practice (Leitch, et al. 29). Although some scholars claim that each work presents opposing statements, the four texts can be read as interrelated contributions to the up-and-coming theory and art (*technê*) of rhetoric (McComiskey 32). Of Gorgias’ surviving works, only the *Encomium* and the *Defense* are believed to exist in their entirety. Meanwhile, there are his own speeches, rhetorical, political, or other. A number of these are referred to and quoted by Aristotle, including a speech on Hellenic unity, a funeral oration for Athenians fallen in war, and a brief quotation from an *Encomium on the Eleans*. Apart from the speeches, there are paraphrases of the treatise "On Nature or the Non-Existent." These works are each part of the Diels-Kranz collection, and although academics consider this source reliable, many of the works included are fragmentary and corrupt. Questions have also been raised as to the authenticity and accuracy of the texts attributed to Gorgias (Consigny 4).

Gorgias’ writings are both rhetorical and performative. He goes to great lengths to exhibit his ability of making an absurd, argumentative position appear stronger. Consequently, each of his works defend positions that are unpopular, paradoxical and even absurd. The performative nature of Gorgias’ writings is exemplified by the way that he playfully approaches each argument with stylistic devices such as parody, artificial figuration and theatricality (Consigny 149). Gorgias’ style of argumentation can be described as poetics-minus-the-meter (*poiêsis-minus-meter*). Gorgias argues that persuasive words have power (*dunamis*) that is equivalent to that of the gods and as strong as physical force. In the *Encomium*, Gorgias likens the effect of speech on the soul to the effect of drugs on the body: “Just as different drugs draw forth different humors from the body – some putting a stop to disease, others to life – so too with words: some cause pain, others joy, some strike fear, some stir the audience to boldness, some benumb and bewitch the soul with evil persuasion” (Gorgias 32).

Gorgias also believed that his "magical incantations" would bring healing to the human psyche by controlling powerful emotions. He paid particular attention to the sounds of words, which, like poetry, could captivate audiences. His florid, rhyming style seemed to hypnotize his audiences (Herrick 42). Gorgias’ legendary powers of persuasion would suggest that he had a somewhat preternatural influence over his audience and their emotions.

Unlike other Sophists, such as Protagoras, Gorgias did not profess to teach *arete* (excellence, or, virtue). He believed that there was no absolute form of *arete*, but that it was relative to each situation (for example, virtue in a slave was not virtue in a statesman) His thought was that rhetoric, the art of persuasion, was the king of all sciences, since it was capable of persuading any course of action. While rhetoric existed in the curriculum of every Sophist, Gorgias placed more prominence upon it than any of the others.

Much debate over both the nature and value of rhetoric begins with Gorgias. Plato’s dialogue entitled *Gorgias* presents a counter-argument to Gorgias’ embrace of rhetoric, its elegant form, and performative nature (Wardy 2). The dialog attempts to show that rhetoric does not meet the requirements to actually be considered a *technê* but is a somewhat dangerous “knack” to possess both for the orator and for his audience. This is because it gives the ignorant the power to seem more knowledgeable than an expert to a group.
On the Non-Existent

Gorgias is the author of a lost work: *On Nature or the Non-Existent*. Rather than being one of his rhetorical works, it presented a theory of being that at the same time refuted and parodied the Eleatic thesis. The original text was lost and today there remain just two paraphrases of it. The first is preserved by the philosopher Sextus Empiricus in *Against the Professors* and the other by the anonymous author of *On Melissus, Xenophanes, and Gorgias*. Each work, however, excludes material that is discussed in the other, which suggests that each version may represent intermediary sources (Consigny 4). It is clear, however, that the work developed a skeptical argument, which has been extracted from the sources and translated as below:

1. Nothing exists;
2. Even if something exists, nothing can be known about it; and
3. Even if something can be known about it, knowledge about it can't be communicated to others.
4. Even if it can be communicated, there is no incentive to do so.

The argument has largely been seen as an ironic refutation of Parmenides' thesis on Being. Gorgias set out to prove that it is as easy to demonstrate that being is one, unchanging and timeless as it is to prove that being has no existence at all.

"How can anyone communicate the idea of color by means of words since the ear does not hear colors but only sounds?" This quote, written by the Sicilian philosopher Gorgias, was used to show his theory that 'there is nothing', 'if there were anything no one would know it', 'and if anyone did know it, no one could communicate it'. This theory, thought of in the late 5th century BC, is still being contemplated by many philosophers throughout the world. This argument has led some to label Gorgias a nihilist (one who believes nothing exists, or that the world is incomprehensible, and that the concept of truth is fictitious). For the first main argument where Gorgias says, "there is no-thing", he tries to persuade the reader that thought and existence are not the same. By claiming that if thought and existence truly were the same, then everything that anyone thought would suddenly exist. He also attempted to prove that words and sensations couldn't be measured by the same standards, for even though words and sensations are both derived from the mind, they are essentially different. This is where his second idea comes into place.

Rhetorical works

Encomium of Helen

In their writings, Gorgias and other sophists speculated "about the structure and function of language" as a framework for expressing the implications of action and the ways decisions about such actions were made" (Jarratt 103). And this is exactly the purpose of Gorgias' *Encomium of Helen*. Of the three divisions of rhetoric discussed by Aristotle in his *Rhetoric* (forensic, deliberative, and epideictic), the *Encomium* can be classified as an epideictic speech, expressing praise for Helen of Troy and ridding her of the blame she faced for leaving Sparta with Paris (Wardy 26).

Helen – the proverbial "Helen of Troy" – exemplified both sexual passion and tremendous beauty for the Greeks. She was the daughter of Zeus and Leda, the Queen of Sparta, and her beauty was the direct cause of the decade long Trojan War between Greece and Troy. The war began after the goddesses Hera, Athena, and Aphrodite asked Paris (a Trojan prince) to select who was the most beautiful of the three. Each goddess tried to influence Paris’ decision, but he ultimately chose Aphrodite who then promised Paris the most beautiful woman. Paris then traveled to Greece where he was greeted by Helen and her husband Menelaus. Under the influence of Aphrodite, Helen allowed Paris to persuade her to elope with him. Together they traveled to Troy, not only sparking the war, but also a popular and literary tradition of blaming Helen for her wrongdoing. It is this tradition which Gorgias confronts in the *Encomium*.

The *Encomium* opens with Gorgias explaining that "a man, woman, speech, deed, city or action that is worthy of praise should be honored with acclaim, but the unworthy should be branded with blame" (Gorgias 30). In the speech

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Gorgias

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Gorgias discusses the possible reasons for Helen’s journey to Troy. He explains that Helen could have been persuaded in one of four ways: by the gods, by physical force, by love, or by speech (logos). If it were indeed the plan of the gods that caused Helen to depart for Troy, Gorgias argues that those who blame her should face blame themselves, “for a human’s anticipation cannot restrain a god’s inclination” (Gorgias 31). Gorgias explains that, by nature, the weak are ruled by the strong, and, since the gods are stronger than humans in all respects, Helen should be freed from her undesirable reputation. If, however, Helen was abducted by force, it is clear that the aggressor committed a crime. Thus, it should be he, not Helen, who should be blamed. And if Helen was persuaded by love, she should also be rid of ill repute because “if love is a god, with the divine power of the gods, how could a weaker person refuse and reject him? But if love is a human sickness and a mental weakness, it must not be blamed as mistake, but claimed as misfortune” (Gorgias 32). Finally, if speech persuaded Helen, Gorgias claims he can easily clear her of blame. Gorgias explains: “Speech is a powerful master and achieves the most divine feats with the smallest and least evident body. It can stop fear, relieve pain, create joy, and increase pity” (Gorgias 31). It is here that Gorgias compares the effect of speech on the mind with the effect of drugs on the body.

The *Encomium* demonstrates Gorgias’ love of *paradoxologia*. The performative nature of the *Encomium* requires a reciprocal relationship between the performer and the audience, one which relies on the cooperation between the deceptive performer and the equally deceived audience (Wardy 36). Gorgias reveals this paradox in the final section of the *Encomium* where he writes: “I wished to write this speech for Helen’s encomium and my amusement” (Gorgias 33). Additionally, if one were to accept Gorgias’ argument for Helen’s exoneration, it would fly in the face of a whole literary tradition of blame directed towards Helen. This too is paradoxical.

**Defense of Palamedes**

In the *Defense of Palamedes* Gorgias describes logos as a positive instrument for creating ethical arguments (McComiskey 38). The *Defense*, an oration that deals with issues of morality and political commitment (Consigny 38), defends Palamedes who, in Greek mythology, is credited with the invention of the alphabet, written laws, numbers, armor, and measures and weights (McComiskey 47).

In the speech Palamedes defends himself against the charge of treason. In Greek mythology, Odysseus – in order to avoid going to Troy with Agamemnon and Menelaus to bring Helen back to Sparta – pretended to have gone mad and began sowing the fields with salt. Palamedes got Odysseus to disclose this information by throwing his son Telemachus in front of the plow. Odysseus, who never forgave Palamedes for making him reveal himself, later accused Palamedes of working with the Trojans. Soon after, Palamedes was condemned and killed (Jarratt 58).

In this epideictic speech, like the *Encomium*, Gorgias is concerned with experimenting with how plausible arguments can cause conventional truths to be doubted (Jarratt 59). Throughout the text, Gorgias presents a method for composing logical (logos), ethical (ethos) and emotional (pathos) arguments from possibility, which are similar to those described by Aristotle in *Rhetoric*. These types of arguments about motive and capability presented in the *Defense* are later described by Aristotle as forensic *topoi*. Gorgias demonstrates that in order to prove that treason had been committed, a set of possible occurrences also need to be established. In the *Defense* these occurrences are as follows: communication between Palamedes and the enemy, exchange of a pledge in the form of hostages or money, and not being detected by guards or citizens. In his defense, Palamedes claims that a small sum of money would not have warranted such a large undertaking and reasons that a large sum of money, if indeed such a transaction had been made, would require the aid of many confederates in order for it to be transported. Palamedes reasons further that such an exchange could neither have occurred at night because the guards would be watching, nor in the day because everyone would be able to see. Palamedes continues, explaining that if the aforementioned conditions were, in fact, arranged then action would need to follow. Such action needed to take place either with or without confederates; however, if these confederates were free men then they were free to disclose any information they desired, but if they were slaves there was a risk of their voluntarily accusing to earn freedom, or accusing by force when tortured. Slaves, Palamedes says, are untrustworthy. Palamedes goes on to list a variety of possible
motives, all of which he proves false.

Through the *Defense* Gorgias demonstrates that a motive requires an advantage such as status, wealth, honour, and security, and insists that Palamedes lacked a motive (McComiskey 47-49).

**Epitaphios (or Athenian funeral oration)**

This text is considered to be an important contribution to the genre of epitaphios. During the 5th and 4th centuries BC, such funeral orations were delivered by well-known orators during public burial ceremonies in Athens, whereby those who died in wars were honoured. Gorgias' text provides a clever critique of 5th century propagandist rhetoric in imperial Athens and is the basis for Plato's parody, *Menexenus* (Consigny 2).

**Critics**

Plato is one of Gorgias' greatest critics. Plato's dislike for sophistic doctrines is well known, and it is in his eponymous dialogue that both Gorgias himself as well as his rhetorical beliefs are ridiculed (McComiskey 17).

In the *Gorgias*, Plato distinguishes between philosophy and rhetoric, characterizing Gorgias as an orator who entertains his audience with his eloquent words and who believes that it is unnecessary to learn the truth about actual matters when one has discovered the art of persuasion (Consigny 36). In the dialogue, Gorgias responds to one of Socrates' statements as follows: "Rhetoric is the only area of expertise you need to learn. You can ignore all the rest and still get the better of the professionals!" (Plato 24).

Plato is sure to make the distinction between playful oration and serious philosophy, arguing that Gorgias, despite his so-called philosophical work *On Non-Existence*, is not a true philosopher. Gorgias, whose *On Non-Existence* is taken to be critical of the Eleatic tradition and its founder Parmenides, describes philosophy as a type of seduction, but he does not deny philosophy entirely, giving some respect to philosophers (Consigny 37).

Plato answers Gorgias by reaffirming the Parmenidean ideal that being is the basic substance and reality of which all things are composed, insisting that philosophy is a dialectic distinct from and superior to rhetoric (Wardy 52).

Aristotle also criticizes Gorgias, labeling him a mere Sophist whose primary goal is to make money by appearing wise and clever, thus deceiving the public by means of misleading or sophistic arguments (Consigny 36).

**References**

[5] Diogenes Laërtius, vi. 2

**Sources**

• This article incorporates text from a publication now in the public domain: Chisholm, Hugh, ed (1911). *Encyclopædia Britannica* (Eleventh ed.). Cambridge University Press.
Hippias of Elis (Greek: Ἱππίας; late 5th century BCE) was a Greek Sophist, and a contemporary of Socrates. With an assurance characteristic of the later sophists, he claimed to be regarded as an authority on all subjects, and lectured on poetry, grammar, history, politics, mathematics, and much else. Most of our knowledge of him is derived from Plato, who characterizes him as vain and arrogant.

Life
Hippias was born at Elis in the mid 5th-century BCE (c. 460 BCE) and was thus a younger contemporary of Protagoras and Socrates. He lived at least as late as Socrates (399 BCE). He was a disciple of Hegesidamus.\(^1\) Owing to his talent and skill, his fellow-citizens availed themselves of his services in political matters, and in a diplomatic mission to Sparta.\(^2\) But he was in every respect like the other sophists of the time: he travelled about in various towns and districts of Greece for the purpose of teaching and public speaking. The two dialogues of Plato, the *Hippias major* and the *Hippias minor* characterize him as vain and arrogant. The *Hippias major* (the authorship of this work by Plato is sometimes doubted) concerns the question about the beautiful, and purposely puts the knowledge and presumption of Hippias in a ludicrous light. The *Hippias minor* discusses the deficiency of our knowledge, and characterizes Hippias as ridiculously vain.

Work
Hippias was a man of very extensive knowledge, and he occupied himself not only with rhetorical, philosophical, and political studies, but was also well versed in poetry, music, mathematics, painting and sculpture, and he claimed some practical skill in the ordinary arts of life, for he used to boast of wearing on his body nothing that he had not made himself with his own hands, such as his seal-ring, his cloak, and shoes.\(^3\) On the other hand, his knowledge always appears superficial, he does not enter into the details of any particular art or science, and is satisfied with certain generalities, which enabled him to speak on everything without a thorough knowledge of any. This arrogance, combined with ignorance, is the main cause which provoked Plato to his severe criticism of Hippias, as the sophist enjoyed a very extensive reputation, and thus had a large influence upon the education of the youths of the higher classes. A mathematical discovery ascribed to Hippias is sometimes called the quadratrix of Hippias. His great skill seems to have consisted in delivering grand show speeches; and Plato has him arrogantly declaring that he would travel to Olympia, and there deliver before the assembled Greeks an oration on any subject that might be proposed to him;\(^4\) and Philostratus in fact speaks of several such orations delivered at Olympia, and which
created great sensation. If such speeches were published by Hippias, then no specimen has come down to us. Plato claims he wrote epic poetry, tragedies, dithyrambs, and various orations, as well works on as grammar, music, rhythm, harmony, and a variety of other subjects. He seems to have been especially fond of choosing antiquarian and mythical subjects for his show speeches. Athenaeus mentions a work of Hippias under the title Synagoge which is otherwise unknown. An epigram of his is preserved in Pausanias.

Notes

1. Suda, Hippias
2. Plato, Hippias major, 281a, 286a; Philostratus, Vit. Soph. i. 11.
3. Plato, Hippias major, 285c, Hippias minor, 368b, Protagoras, 315c; Philostratus, Vit. Soph. i. 11.; Themistius, Orat. xxix. p. 345. d.
4. Plat. Hippias minor, 363
5. Plato Hippias minor, 368
7. Athenaeus, xiii. 609
8. Pausanias, v. 25

External links

- O'Connor, John J.; Robertson, Edmund F., "Hippias" (http://www-history.mcs.st-andrews.ac.uk/Biographies/Hippias.html), MacTutor History of Mathematics archive, University of St Andrews.
- Hippias' Attempt to Trisect an Angle (http://mathdl.maa.org/convergence/1/?pa=content&sa=viewDocument&nodeId=1207&bodyId=1352) at Convergence (http://mathdl.maa.org/convergence/1/)

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Prodicus

Prodicus of Ceos (Greek: Πρόδικος, Pródikos; c. 465 BC – c. 395 BC) was a Greek philosopher, and part of the first generation of Sophists. He came to Athens as ambassador from Ceos, and became known as a speaker and a teacher. Plato treats him with greater respect than the other sophists, and in several of the Platonic dialogues Socrates appears as the friend of Prodicus. Prodicus made linguistics and ethics prominent in his curriculum. The content of one of his speeches is still known, and concerns a fable in which Heracles has to make a choice between Virtue and Vice. He also interpreted religion through the framework of naturalism.

Life

Prodicus was a native of Ioulis on the island of Ceos, the birthplace of Simonides, whom he is described as having imitated. Prodicus came frequently to Athens for the purpose of transacting business on behalf of his native city, and attracted admiration as an orator, although his voice was deep and apt to fall. Plutarch describes him as slender and weak; and Plato also alludes to his weakness, and a degree of effeminacy which thus resulted. Philostratus accuses him of luxury and avarice, but no earlier source mentions this.
In the Protagoras of Plato, (dramatic date c. 430 BC), Prodicus is mentioned as having previously arrived in Athens. He appears in a play of Eupolis, and in The Clouds (423 BC) and The Birds (414 BC) of Aristophanes. He came frequently to Athens on public business. His pupils included the orators Theramenes and Isocrates and in the year of the death of Socrates (399 BC), Prodicus was still living. According to the statement of Philostratus, on which little reliance can be placed, he delivered his lecture on virtue and vice in Thebes and Sparta also. The Apology of Plato unites him with Gorgias and Hippias as among those who were considered competent to instruct the youth in any city. Lucian mentions him among those who held lectures at Olympia.

In the dialogues of Plato he is mentioned or introduced with a certain degree of esteem, compared with the other sophists. Aristophanes, in The Clouds, deals more indulgently with him than with Socrates; and Xenophon's Socrates, for the purpose of combating the voluptuousness of Aristippus, borrows from the book of "the wise Prodicus" the story of the choice of Hercules. Like Protagoras and others, Prodicus delivered lectures in return for payment of from half a drachma to 50 drachmae, probably according to whether the hearers limited themselves to a single lecture or a more complete course. Prodicus is said to have amassed a great amount of money. The assertion that he hunted after rich young men, is only found in Philostratus.

Teachings

Prodicus was part of the first generation of Sophists. "He was a Sophist in the full sense of a professional freelance educator." As he taught both philosophy and politics, so Plato represents his instructions as chiefly ethical and gives preference to his distinction of ideas, such as courage, rashness, boldness, over similar attempts of other sophists. He sometimes gave individual show- orations, and though known to Callimachus, they do not appear to have been long preserved. In contrast with Gorgias and others, who boasted of possessing the art of making the small appear great, the great small, and of expatiating in long or short speeches, Prodicus required that the speech should be neither long nor short, but of the proper measure, and it is only as associated with other sophists that he is charged with endeavouring to make the weaker cause appear strong by means of his rhetoric.

Linguistics

Several of Plato's dialogues focus upon Prodicus' linguistic theory, and his insistence upon the correct use of names. He paid special attention to the correct use of words, and the distinction of expressions related in sense. Thucydides is said to have gained from him his accuracy in the use of words. In the Cratylus, Socrates jokes that if he could have afforded the fifty drachma lectures he would now be an expert on "the correctness of names." In several of the Platonic dialogues Socrates appears as the friend and companion of Prodicus, which reveals at least that the two did have close personal relations, and that Socrates did attend at least a few of his lectures. "For Socrates, correct language was the prerequisite for correct living (including an efficient government). But Prodicus, though his linguistic teaching undoubtedly included semantic distinctions between ethical terms, had stopped at the threshold. The complete art of logoi embraced nothing less than the whole of philosophy."

Ethics

The speech on the choice of Hercules was entitled Horai (Ancient Greek: Ὑραι). Hercules, as he was entering manhood, had to choose one of the two paths of life, that of virtue and that of vice. There appeared two women, the one of dignified beauty, adorned with purity, modesty, and discretion, the other of a voluptuous form, and meretricious look and dress. The latter promises to lead him by the shortest road, without any toil, to the enjoyment of every pleasure. The other, while she reminds him of his progenitors and his noble nature, does not conceal from him that the gods have not granted what is really beautiful and good apart from trouble and careful striving. While one seeks to deter him from the path of virtue by urging the difficulty of it; the other calls attention to the unnatural character of enjoyment which anticipates the need of it, its want of the highest joy, that arising from noble deeds, and the consequences of a life of voluptuousness, and how she herself, honoured by gods and men, leads to all noble
works, and to true well-being in all circumstances of life. Hercules decides for virtue. This outline in Xenophon probably represents, in a very abbreviated form, the leading ideas of the original, of which no fragments remain.

Another speech, apparently by Prodicus, is mentioned in the spurious Platonic dialogue *Eryxias*. Prodicus undertakes to show that the value of external goods depends simply upon the use which is made of them, and that virtue must be learnt. Similar sentiments were expressed in Prodicus’s *Praise of Agriculture*.\[33\] The spurious dialogue *Axiochus* attributes to him views respecting the worthlessness of earthly life in different ages and callings, and how we must long after freedom from connection with the body in the heavenly and cognate aether. Also found here is a doctrine that death is not to be feared, as it affects neither the living nor the departed.\[34\]

**Naturalism**

Prodicus, like some of his fellow Sophists, interpreted religion through the framework of naturalism. The gods he regarded as personifications of the sun, moon, rivers, fountains, and whatever else contributes to the comfort of our life,\[35\] and he was sometimes charged with atheism.\[36\] “His theory was that primitive man was so impressed with the gifts nature provided him for the furtherance of his life that he believed them to be the discovery of gods or attributes to him.\[37\] # References

[5] Plutarch, *an senti ger. sit Resp.* c. 15
[8] Aristophanes, 1. 360
[15] Aristophanes, 1. 360
[16] Xenophon, *Memor.* ii. 1. § 21
[23] Plato, *Lach*. 197c
[29] Plato, *Cratylus*, 384b
[31] Philostratus, p. 496; Xenophon, *Mem.* ii. 1. § 21
[33] Themistius, *Orat.* 30
[34] comp. *Stobaeus, Serm.* xx, 35

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The Seven Sages

Seven Sages of Greece

The Seven Sages (of Greece) or Seven Wise Men (Greek: οἱ ἑπτὰ σοφοί, hoi hepta sophoi; c. 620 BCE–550 BCE) was the title given by ancient Greek tradition to seven early 6th century BCE philosophers, statesmen and law-givers who were renowned in the following centuries for their wisdom.

The Seven Sages

Traditionally, each of the seven sages represents an aspect of worldly wisdom which is summarized an aphorism. Although the list of sages sometimes varies, the ones usually included are the following:

- **Cleobulus of Lindos**: "Moderation is the best thing." He governed as tyrant of Lindos, in the Greek island of Rhodes, circa 600 BC.
- **Solon of Athens**: "Keep everything with moderation." Solon (640-559 BC) was a famous legislator and reformer from Athens, framing the laws shaped the Athenian democracy.
- **Chilon of Sparta**: "You should not desire the impossible." Chilon was a Spartan politician from the 6th century BC, to whom the militarization of Spartan society was attributed.
- **Bias of Priene**: "Most men are bad." Bias was a politician and legislator the 6th century BC.
- **Thales of Miletus**: Thales is the first well-known philosopher and mathematician. His advice, "Know thyself," was engraved on the front façade of the Oracle of Apollo in Delphi.
- **Pittacus of Mytilene** (c. 650 BC), governed Mytilene (Lesbos) along with Myrsilus. He tried to reduce the power of the nobility and was able to govern with the support of the popular classes, whom he favoured. He famously said "You should know which opportunities to choose."
- **Periander of Corinth**: he was the tyrant of Corinth in the 7th and 6th centuries BC. Under his rule, Corinth knew a golden age of unprecedented stability. He was known saying "Be farsighted with everything."

Sources and legends

The oldest explicit mention on record of a standard list of seven sages is in Plato's *Protagoras*, where Socrates says:

> "...There some, both at present and of old, who recognized that Spartanizing is much more a love of wisdom than a love of physical exercise, knowing that the ability to utter such [brief and terse] remarks belongs to a perfectly educated man. Among these were Thales of Miletus, and Pittacus of Mytilene, and Bias of Priene, and our own Solon, and Cleobulus of Lindus, and Myson of Chen, and the seventh of them was said to be Chilon of Sparta. They all emulated and admired and were students of Spartan education, could tell their wisdom was of this sort by the brief but memorable remarks they each uttered when they met and jointly the first fruits of their wisdom to Apollo in his shrine at Delphi, writing what is on every man's lips: Know thyself, and Nothing too much. Why do I say this? Because this was the manner of philosophy among the ancients, a kind of laconic brevity."

The passage in which the above occurs is "elaborately ironical"; so it is unclear which of its aspects may be taken seriously, although Diogenes Laertius later confirms that there were indeed seven such individuals who were held...
in high esteem for their wisdom well before Plato's time. According to Demetrius Phalereus, it was during the archonship of Damasias (582/1 BCE) that the seven first become known as "the wise men", Thales being the first so acknowledged.\footnote{Kirk, Raven, & Schofield, \textit{The Presocratic Philosophers} (Cambridge, 1983, 2nd edition), p. 76, citing Diogenes Laertius, i. 22.}

Diogenes points out, however, that there was among his sources great disagreement over which figures should be counted among the seven.\footnote{Kirk, Raven, & Schofield, \textit{The Presocratic Philosophers} (Cambridge, 1983, 2nd edition), p. 76, citing Diogenes Laertius, i. 22.} Perhaps the two most common substitutions were to exchange Periander or Anacharsis for Myson. On Diogenes' first list of seven, which he introduces with the words "These men are acknowledged wise," Periander appears instead of Myson\footnote{Diogenes Laertius, i. 41} ; the same substitution appears in \textit{The Masque of the Seven Sages} by Ausonius.\footnote{Ausonius, \textit{The Masque of the Seven Sages} (http://www.archive.org/stream/deciausonius01ausouoft#page/310/mode/2up)} Both Ephorus\footnote{Diogenes Laertius, i. 13} and Plutarch (in his \textit{Banquet of the Seven Sages}) substituted Anacharsis for Myson. Diogenes Laertius further states that Dicaearchus gave ten possible names,\footnote{Diogenes Laertius, i. 42} Hippobotus suggested twelve names,\footnote{Diogenes Laertius, i. 42} and Hermippus enumerated seventeen possible sages from which different people made different selections of seven.\footnote{Diogenes Laertius, i. 42} Leslie Kurke contends that "Aesop was a popular contender for inclusion in the group"; an epigram of the 6th century CE poet Agathias (\textit{Palatine Anthology} 16.332) refers to a statue of the Seven Sages, with Aesop standing before them.\footnote{Leslie Kurke, \textit{Aesopic Conversations: Popular Tradition, Cultural Dialogue, and the Invention of Greek Prose}, Princeton University Press, 2010, pp. 131-2, 135.}

Later tradition ascribed to each sage a pithy saying of his own, but ancient as well as modern scholars have doubted the legitimacy of such ascriptions.\footnote{H. Parke and D. Wormell, \textit{The Delphic Oracle}, (Basil Blackwell, 1956), vol. 1, pp. 387-389.} A compilation of 147 maxims, inscribed at Delphi, was preserved by the fifth century CE scholar Stobaeus as "Sayings of the Seven Sages,\footnote{Kurke, p. 109.} but "the actual authorship of the...maxims set up on the Delphian temple may be left uncertain. Most likely they were popular proverbs, which tended later to be attributed to particular sages."\footnote{Parke & Wormell, p. 389.}

In addition to being credited for pithy sayings, the wise men were also apparently famed for practical inventions; in Plato's \textit{Republic} (600a), it is said that it "befits a wise man" to have "many inventions and useful devices in the crafts or sciences" attributed to him, citing Thales and Anacharsis the Scythian as examples.

According to a number of moralistic stories, there was a golden tripod (or, in some versions of the story, a bowl or cup) which was to be given to the wisest. Allegedly, it passed in turn from one of the seven sages to another, beginning with Thales, until one of them (either Thales or Solon, depending on the story) finally dedicated it to Apollo who was held to be wisest of all.\footnote{Diogenes Laertius i. 27ff.; R. Martin, "Seven Sages", \textit{Encyclopedia of Classical Philosophy} (ed. D. Zeyl, 1997), p. 487; Parke & Wormell, pp. 387-388} According to Diogenes, Dicaearchus claimed that the Seven "were neither wise men nor philosophers, but merely shrewd men, who had studied legislation.\footnote{Diogenes Laertius, i. 40.} And according to at least one modern scholar, the claim is correct: "With the exception of Thales, no one whose life is contained in [Diogenes'] Book I [i.e. none of the above] has any claim to be styled a philosopher."\footnote{p. 42 note a, R. Hicks, \textit{Diogenes Laertius: Lives of Eminent Philosophers}, vol. 1, Harvard University Press, 1925.}
Solon

Solon (ancient Greek: Σόλων, c. 638 BC – 558 BC) was an Athenian statesman, lawmaker, and poet. He is remembered particularly for his efforts to legislate against political, economic and moral decline in archaic Athens. His reforms failed in the short term yet he is often credited with having laid the foundations for Athenian democracy.\(^1\) \(^2\) \(^3\) \(^4\)

Knowledge of Solon is limited by the lack of documentary and archeological evidence covering Athens in the early 6th century BC.\(^5\) \(^6\) He wrote poetry for pleasure, as patriotic propaganda, and in defence of his constitutional reforms. His works only survive in fragments. They appear to feature interpolations by later authors and it is possible that fragments have been wrongly attributed to him (see Solon the reformer and poet). Ancient authors such as Herodotus and Plutarch are the main source of information, yet they wrote about Solon hundreds of years after his death, at a time when history was by no means an academic discipline (see Anecdotes). Fourth century orators, such as Aeschines, tended to attribute to Solon all the laws of their own, much later times.\(^7\) Archaeology reveals glimpses of Solon's period in the form of fragmentary inscriptions but little else. For some scholars, our 'knowledge' of Solon and his times is largely a fictive construct based on insufficient evidence\(^8\) \(^9\) while others believe a substantial body of real knowledge is still attainable.\(^10\) Solon and his times can appear particularly interesting to students of history as a test of the limits and nature of historical argument.\(^11\)

Background to Solon's reforms

During Solon's time, many Greek city-states had seen the emergence of tyrants, opportunistic noblemen who had grabbed power on behalf of sectional interests. In Sicyon, Cleisthenes had usurped power on behalf
of an Ionian minority. In Megara, Theagenes had come to power as an enemy of the local oligarchs. The son-in-law of Theagenes, an Athenian nobleman named Cylon, made an unsuccessful attempt to seize power in Athens in 632 BC. Solon, on the other hand, appears to have been temporarily awarded autocratic powers by his fellow citizens on the grounds that he had the wisdom to sort out their differences for them in a peaceful and equitable manner.\[12\] According to ancient sources,\[13\]\[14\] he obtained these powers when he was elected eponymous archon (594/3 BC). Some modern scholars believe these powers were in fact granted some years after Solon had been archon, when he would have been a member of the Areopagus and probably a more respected statesman by his (aristocratic) peers.\[15\]\[16\]\[17\]

The social and political upheavals that characterised Athens in Solon's time have been variously interpreted by historians from ancient times to the present day. Two contemporary historians have identified three distinct historical accounts of Solon's Athens, emphasizing quite different rivalries: economic and ideological rivalry, regional rivalry and rivalry between aristocratic clans.\[18\]\[19\] These different accounts provide a convenient basis for an overview of the issues involved.

- **Economic and ideological rivalry** is a common theme in ancient sources. This sort of account emerges from Solon's poems (e.g. see below Solon the reformer and poet), in which he casts himself in the role of a noble mediator between two intertemperate and unruly factions. This same account is substantially taken up about three centuries later by the author of the *Athenaion Politeia* but with an interesting variation: "...there was conflict between the nobles and the common people for an extended period. For the constitution they were under was oligarchic in every respect and especially in that the poor, along with their wives and children, were in slavery to the rich...All the land was in the hands of a few. And if men did not pay their rents, they themselves and their children were liable to be seized as slaves. The security for all loans was the debtor's person up to the time of Solon. He was the first champion of the people."\[20\]

Here Solon is presented as a partisan in a democratic cause whereas, judged from the viewpoint of his own poems, he was instead a mediator between rival factions. A still more significant variation in the ancient historical account appears in the writing of Plutarch in the late 1st-early 2nd century AD:

'Athen was torn by recurrent conflict about the constitution. The city was divided into as many parties as there were geographical divisions in its territory. For the party of the people of the hills was most in favour of democracy, that of the people of the plain was most in favour of oligarchy, while the third group, the people of the coast, which preferred a mixed form of constitution somewhat between the other two, formed an obstruction and prevented the other groups from gaining control.\[21\]

The ancient historical account here demonstrates a more sophisticated understanding of political process - what were two sides in Solon's account have now become three parties, each with a regional base and a constitutional
platform. Plutarch then goes on to repeat the usual ancient account with its brutal landlords on one side and wretched tenants on the other. But how does this melodramatic struggle between haves and have-nots fit into a picture of three regional groupings?

- **Regional rivalry** is a theme commonly found among modern scholars.\(^{[22]}\)\(^{[23]}\)\(^{[24]}\)\(^{[25]}\)

'The new picture which emerged was one of strife between regional groups, united by local loyalties and led by wealthy landowners. Their goal was control of the central government at Athens and with it dominance over their rivals from other districts of Attika.'\(^{[26]}\)

Regional factionalism was inevitable in a relatively large territory such as Athens possessed. In most Greek city states, a farmer could conveniently reside in town and travel to and from his fields every day. According to Thucydides, on the other hand, most Athenians continued to live in rural settlements right up until the Peloponnesian War.\(^{[27]}\) The effects of regionalism in a large territory could be seen in Laconia, where Sparta had gained control through intimidation and resettlement of some of its neighbours and enslavement of the rest. Attika in Solon's time seemed to be moving towards a similarly ugly solution with many citizens in danger of being reduced to the status of helots.\(^{[28]}\)

- **Rivalry between clans** is a theme recently developed by some scholars, based on an appreciation of the political significance of kinship groupings.\(^{[26]}\)\(^{[29]}\)\(^{[30]}\)\(^{[31]}\)\(^{[32]}\)\(^{[33]}\) According to this account, bonds of kinship rather than local loyalties were the decisive influence on events in archaic Athens. An Athenian belonged not only to a phyle or tribe and one of its subdivisions, the phratry or brotherhood, but also to an extended family, clan or genos. It has been argued that these interconnecting units of kinship reinforced a hierarchic structure with aristocratic clans at the top.\(^{[18]}\)\(^{[34]}\) Thus rivalries between aristocratic clans could engage all levels of society irrespective of any regional ties. In that case, the struggle between rich and poor was the struggle between powerful aristocrats and the weaker affiliates of their rivals or perhaps even with their own rebellious affiliates.

The historical account of Solon's Athens has evolved over many centuries into a set of contradictory stories or a complex story that might be interpreted in a variety of ways. As further evidence accumulates, and as historians continue to debate the issues, Solon's motivations and the intentions behind his reforms will continue to attract speculation (see for example John Bintliff's 'Solon's Reforms: an archaeological perspective':\(^{[35]}\) and other essays published with it\(^{[36]}\)).

### Solon's reforms

Solon's laws were inscribed on large wooden slabs or cylinders attached to a series of axles that stood upright in the Prytaneum.\(^{[37]}\)\(^{[38]}\)

These *axones* appear to have operated on the same principle as a Lazy Susan, allowing both convenient storage and ease of access. Originally the axones recorded laws enacted by Draco in the late 7th Century (traditionally 621 BC). Nothing of Draco's codification has survived except for a law relating to homicide, yet there is consensus among scholars that it did not amount to anything like a constitution.\(^{[39]}\)\(^{[40]}\)

Solon repealed all Draco's laws except those relating to homicide.\(^{[41]}\)

Fragments of the axones were still visible in Plutarch's time \(^{[42]}\) but today the only records we have of Solon's laws are fragmentary quotes and comments in literary sources such as those written by Plutarch himself. Moreover, the language of his laws was archaic even by the standards of the fifth century and this caused interpretational problems for ancient commentators.\(^{[43]}\)

Modern scholars doubt the reliability of these sources and our knowledge of Solon's legislation is therefore actually very limited in its details.

Generally, Solon's reforms appear to have been constitutional, economic and moral in their scope. This distinction, though somewhat artificial, does at least provide a convenient framework within which to consider the laws that have been attributed to Solon. Some short term consequences of his reforms are considered at the end of the section.
Constitutional reform

Previous to Solon's reforms, the Athenian state was administered by nine archons appointed or elected annually by the Areopagus on the basis of noble birth and wealth. The Areopagus comprised former archons and it therefore had, in addition to the power of appointment, extraordinary influence as a consultative body. The nine archons took the oath of office while ceremonially standing on a stone in the agora, declaring their readiness to dedicate a golden statue if they should ever be found to have violated the laws. There was an assembly of Athenian citizens (the Ekklesia) but the lowest class (the Thetes) was not admitted and its deliberative procedures were controlled by the nobles. There therefore seemed to be no means by which an archon could be called to account for breach of oath unless the Areopagus favoured his prosecution.

According to Aristotle, Solon legislated for all citizens to be admitted into the Ekklesia and for a court (the Heliaia) to be formed from all the citizens. The Heliaia appears to have been the Ekklesia, or some representative portion of it, sitting as a jury. By giving common people the power not only to elect officials but also to call them to account, Solon appears to have established the foundations of a true democracy. However some scholars have doubted whether Solon actually included the Thetes in the Ekklesia, this being considered too bold a move for any aristocrat in the archaic period. Ancient sources credit Solon with the creation of a Council of Four Hundred, drawn from the four Athenian tribes to serve as a steering committee for the enlarged Ekklesia. However, many modern scholars have doubted this also.

There is consensus among scholars that Solon broadened the financial and social qualifications required for election to public office. The Solonian constitution divided citizens into four political classes defined according to assessable property, a classification that might previously have served the state for military or taxation purposes only. The standard unit for this assessment was one medimnos (approximately 12 gallons) of cereals and yet the kind of classification set out below might be considered too simplistic to be historically accurate.

- **Pentacosiomedimnai**
  - valued at 500 medimnoi of cereals annually.
  - eligible to serve as Strategoi (Generals)

- **Hippeis**
  - valued at 300 medimnoi production annually.
  - approximating to the mediaeval class of knights, they had enough wealth to equip themselves for the Cavalry

- **Zeugitai**
  - valued at a 200 medimnoi production annually.
  - approximating to the mediaeval class of Yeoman, they had enough wealth to equip themselves for the infantry (Hoplite)

- **Thetes**
  - valued 199 medimnoi annually or less
  - manual workers or sharecroppers, they served voluntarily in the role of batman, or as auxiliaries armed for instance with the sling or as rowers in the Navy.

According to Aristotle, only the Pentacosiomedimnai were eligible for election to high office as archons and therefore only they gained admission into the Areopagus. A modern view affords the same privilege to the hippeis. The top three classes were eligible for a variety of lesser posts and only the Thetes were excluded from all public office.

Depending on how we interpret the historical facts known to us, Solon's constitutional reforms were either a radical anticipation of democratic government, or they merely provided a plutocratic flavour to a stubbornly aristocratic
regime, or else the truth lies somewhere between these two extremes.\textsuperscript{[63]}

**Economic reform**

Solon's economic reforms need to be understood in the context of the primitive, subsistence economy that prevailed both before and after his time. Most Athenians were still living in rural settlements right up to the Peloponnesian War.\textsuperscript{[64]} Opportunities for trade even within the Athenian borders were limited. The typical farming family, even in classical times, barely produced enough to satisfy its own needs.\textsuperscript{[65]} Opportunities for international trade were minimal. It has been estimated that, even in Roman times, goods rose 40% in value for every 100 miles they were carried over land, but only 1.3% for the same distance they were carried by ship\textsuperscript{[66]} and yet there is no evidence that Athens possessed any merchant ships until around 525 BC.\textsuperscript{[67]} Until then, the narrow warship doubled as a cargo vessel. Athens, like other Greek city states in the 7th Century BC, was faced with increasing population pressures\textsuperscript{[68]} and by about 525 BC it was able to feed itself only in 'good years'.\textsuperscript{[69]}

Solon's reforms can thus be seen to have taken place at a crucial period of economic transition, when a subsistence rural economy increasingly required the support of a nascent commercial sector. The specific economic reforms credited to Solon are these:

- Fathers were encouraged to find trades for their sons; if they did not, there would be no legal requirement for sons to maintain their fathers in old age.\textsuperscript{[70]}
- Foreign tradesmen were encouraged to settle in Athens; those who did would be granted citizenship, provided they brought their families with them.\textsuperscript{[71]}
- Cultivation of olives was encouraged; the export of all other produce was prohibited.\textsuperscript{[72]}
- Competitiveness of Athenian commerce was promoted through revision of weights and measures, possibly based on successful standards already in use elsewhere, such as Aegina or Euboea\textsuperscript{[73]} \textsuperscript{[74]} or, according to the ancient account but unsupported by modern scholarship, Argos.\textsuperscript{[75]}

It is generally assumed, on the authority of ancient commentators\textsuperscript{[76]} \textsuperscript{[77]} that Solon also reformed the Athenian coinage. However, recent numismatic studies now lead to the conclusion that Athens probably had no coinage until around 560 BC, well after Solon's reforms.\textsuperscript{[78]}

Solon's economic reforms succeeded in stimulating foreign trade. Athenian black-figure pottery was exported in increasing quantities and good quality throughout the Aegean between 600 BC and 560 BC, a success story that coincided with a decline in trade in Corinthian pottery.\textsuperscript{[79]} The ban on the export of grain might be understood as a relief measure for the benefit of the poor. However, the encouragement of olive production for export could actually have led to increased hardship for many Athenians since it would have led to a reduction in the amount of land dedicated to grain. Moreover an olive produces no fruit for the first six years.\textsuperscript{[80]} The real motives behind Solon's economic reforms are therefore as questionable as his real motives for constitutional reform. Were the poor being forced to serve the needs of a changing economy, or was the economy being reformed to serve the needs of the poor?

**Moral reform**

In his poems, Solon portrays Athens as being under threat from the unrestrained greed and arrogance of its citizens.\textsuperscript{[81]} Even the earth (Gaia), the mighty mother of the gods, had been enslaved.\textsuperscript{[82]} The visible symbol of this perversion of the natural and social order was a boundary marker called a horos, a wooden or stone pillar indicating that a farmer was in debt or under contractual obligation to someone else, either a noble patron or a creditor.\textsuperscript{[83]} Up until Solon's time, land was the inalienable property of a family or clan\textsuperscript{[84]} and it could not be sold or mortgaged. This was no disadvantage to a clan with large landholdings since it could always rent out farms in a sharecropping
system. A family struggling on a small farm however could not use the farm as security for a loan even if it owned
the farm. Instead the farmer would have to offer himself and his family as security, providing some form of slave
labour in lieu of repayment. Equally, a family might voluntarily pledge part of its farm income or labour to a
powerful clan in return for its protection. Farmers subject to these sorts of arrangements were loosely known as
hektemoroi indicating that they either paid or kept a sixth of a farm's annual yield. In the event of 'bankruptcy', or failure to honour the contract stipulated by the horoi, farmers and their families could in fact be sold into slavery.

Solon's reform of these injustices was later known and celebrated among Athenians as the Seisachtheia (shaking
off of burdens). As with all his reforms, there is considerable scholarly debate about its real significance.
Many scholars are content to accept the account given by the ancient sources, interpreting it as a cancellation of
debts, while others interpret it as the abolition of a type of feudal relationship, and some prefer to explore new
possibilities for interpretation. The reforms included:

- annulment of all contracts symbolised by the horoi.
- prohibition on a debtor's person being used as security
  for a loan.
- release of all Athenians who had been enslaved.

The removal of the horoi clearly provided immediate economic relief for the most oppressed group in Attica,
and it also brought an immediate end to the enslavement of Athenians by their countrymen. Some Athenians had
already been sold into slavery abroad and some had fled abroad to escape enslavement - Solon proudly records in
verse the return of this diaspora. It has been cynically observed, however, that few of these unfortunates were
likely to have been recovered. It has been observed also that the seisachtheia not only removed slavery and
accumulated debt, it also removed the ordinary farmer's only means of obtaining further credit.

The seisachtheia however was merely one set of reforms within a broader agenda of moral reformation. Other
reforms included:

- the abolition of extravagant dowries.
- legislation against abuses within the system of inheritance, specifically with relation to the epikleros (i.e. a female
  who had no brothers to inherit her father's property and who was traditionally required to marry her nearest
  paternal relative in order to produce an heir to her father's estate).
- entitlement of any citizen to take legal action on behalf of another.
- the disenfranchisement of any citizen who might refuse to take up arms in times of civil strife, a measure that was
  intended to counteract dangerous levels of political apathy.

The personal modesty and frugality of the rich and powerful men of Athens in the city's subsequent golden age have
been attested to by Demosthenes. Perhaps Solon, by both personal example and legislated reform, established a
precedent for this decorum. A heroic sense of civic duty later united Athenians against the might of the Persians.
Perhaps this public spirit was instilled in them by Solon and his reforms. Also see Solon and Athenian sexuality

This 6th Century Athenian black-figure urn, in the British Museum, depicts the olive harvest. Many farmers, enslaved for
debt, would have worked on large estates for their creditors.
The Aftermath of Solon's reforms

After completing his work of reform, Solon surrendered his extraordinary authority and left the country. According to Herodotus [108] the country was bound by Solon to maintain his reforms for 10 years, whereas according to Plutarch [42] and the author of Atheneion Politeia [109] (reputedly Aristotle) the contracted period was instead 100 years. A modern scholar [110] considers the time-span given by Herodotus to be historically accurate because it fits the 10 years that Solon was said to have been absent from the country. [111] Within 4 years of Solon's departure, the old social rifts re-appeared, but with some new complications. There were irregularities in the new governmental procedures, elected officials sometimes refused to stand down from their posts and sometimes important posts were left vacant. It has even been said that some people blamed Solon for their troubles. [112] Eventually one of Solon's relatives, Pisistratus, ended the factionalism by force, thus instituting an unconstitutionally gained tyranny. In Plutarch's account, Solon accused Athenians of stupidity and cowardice for allowing this to happen. [113]

Solon the reformer and poet

Solon was the first of the Athenian poets whose work has survived to the present day. His verses have come down to us in fragmentary quotations by ancient authors such as Plutarch and Demosthenes [114] who used them to illustrate their own arguments. It is possible that some fragments have been wrongly attributed to him [115] and some scholars have detected interpolations by later authors. [116]

The literary merit of Solon's verse is generally considered unexceptional. Solon the poet can be said to appear 'self-righteous' and 'pompous' at times [117] and he once composed an elegy with moral advice for a more gifted elegiac poet, Mimnermus. Most of the extant verses show him writing in the role of a political activist determined to assert personal authority and leadership. According to Plutarch [118] however, Solon originally wrote poetry for amusement, discussing pleasure in a popular rather than philosophical way. Solon's elegiac style is said to have been influenced by the example of Tyrtaeus. [119] He also wrote iambic and trochaic verses which, according to one modern scholar, [120] are more lively and direct than his elegies and possibly paved the way for the iambics of Athenian drama.

Solon's verses are mainly significant for historical rather than aesthetic reasons, as a personal record of his reforms and attitudes. However, poetry is not an ideal genre for communicating facts and very little detailed information can be derived from the surviving fragments [121] According to the poet, Solon the reformer was a voice for political moderation in Athens at a time when his fellow citizens were increasingly polarized by social and economic differences:

πολλοὶ γὰρ πλουτεῦσιν κακοὶ, ἄγαθοὶ δὲ πένονται:
ἀλλ' ἡμεῖς αὐτοῖς οὐ διαμειψόμεθα
τῆς ἄρετῆς τὸν πλοῦτον: ἐπεὶ τὸ μὲν ἐξετεύδων αἰεί,
χρήσατα δ' ἐνθρωπίστον ἀλλοτρὸ ἄλλος ἔξει.

Some wicked men are rich, some good are poor;
We will not change our virtue for their store:
Virtue's a thing that none can take away,
But money changes owners all the day. [122]
Solon gave voice to Athenian 'nationalism', particularly in the city state's struggle with Megara, its neighbour and rival in the Saronic Gulf. Plutarch professes admiration of Solon's elegy urging Athenians to recapture the island of Salamis from Megarian control. The same poem was said by Diogenes Laertios to have stirred Athenians more than any other verses that Solon wrote:

Let us go to Salamis to fight for the island
We desire, and drive away our bitter shame! 

It is possible that Solon backed up this poetic bravado with true valour on the battlefield.

**Solon and Athenian sexuality**

As a regulator of Athenian society, Solon, according to some authors, also formalized its sexual mores. According to a surviving fragment from a work ("Brothers") by the comic playwright Philemon, Solon established publicly funded brothels at Athens in order to "democratize" the availability of sexual pleasure. While the veracity of this comic account is open to doubt, at least one modern author considers it significant that in Classical Athens, three hundred or so years after the death of Solon, there existed a discourse that associated his reforms with an increased availability of heterosexual pleasure.

Ancient authors also say that Solon regulated pederastic relationships in Athens; this has been presented as an adaption of custom to the new structure of the polis. According to various authors, ancient lawgivers (and therefore Solon by implication) drew up a set of laws that were intended to promote and safeguard the institution of pederasty and to control abuses against freeborn boys. In particular, the orator Aeschines cites laws excluding slaves from wrestling halls and forbidding them to enter pederastic relationships with the sons of citizens. Accounts of Solon's laws by 4th Century orators like Aeschines, however, are considered unreliable for a number of reasons;[7] [134] [135]

Attic pleaders did not hesitate to attribute to him (Solon) any law which suited their case, and later writers had no criterion by which to distinguish earlier from later works. Nor can any complete and authentic collection of his statutes have survived for ancient scholars to consult.

Besides the alleged legislative aspect of Solon's involvement with pederasty, there were also suggestions of personal involvement. According to some ancient authors Solon had taken the future tyrant Peisistratus as his eromenos.
Aristotle, writing around 330BC, attempted to refute that belief, claiming that "those are manifestly talking nonsense who pretend that Solon was the lover of Peisistratus, for their ages do not admit of it," as Solon was about thirty years older than Peisistratus. Nevertheless the tradition persisted. Four centuries later Plutarch ignored Aristotle's skepticism and recorded the following anecdote, supplemented with his own conjectures:

And they say Solon loved Peisistratus; and that is the reason, I suppose, that when afterwards they differed about the government, their enmity never produced any hot and violent passion, they remembered their old kindnesses, and retained "Still in its embers living the strong fire" of their love and dear affection.

A century after Plutarch, Aelian also said that Peistratus had been Solon's eromenos. Despite its persistence, however, it is not known whether the account is historical or fabricated. It has been suggested that the tradition presenting a peaceful and happy coexistence between Solon and Peisistratus was cultivated during the latter's dominion, in order to legitimize his own rule, as well as that of his sons. Whatever its source, later generations lent credence to the narrative. Solon's presumed pederastic desire was thought in antiquity to have found expression also in his poetry, which is today represented only in a few surviving fragments. The authenticity of all the poetic fragments attributed to Solon is however uncertain - in particular, pederastic aphorisms ascribed by some ancient sources to Solon have been ascribed by other sources to Theognis instead. (See also Solon the reformer and poet.)

**Anecdotes**

Details about Solon's personal life have been passed down to us by ancient authors such as Plutarch and Herodotus. Herodotus is sometimes referred to both as 'the father of history' and 'the father of lies'. Plutarch, by his own admission, did not write histories so much as biographies; he believed that a jest or a phrase could reveal more about a person's character than could a battle that cost thousands of lives. A battle of course is a matter of historical record; a jest or a phrase is not.

According to Plutarch, Solon was related to the tyrant Pisistratus (their mothers were cousins). Solon's father Execestides could trace his ancestry back to Codrus, the last King of Athens. Solon's family belonged to a noble or Eupatrid clan yet it possessed only moderate wealth and Solon was therefore drawn into an unaristocratic pursuit of commerce. According to Diogenes Laertius, he had a brother named Dropidas and was an ancestor (six generations removed) of Plato.

Solon was given leadership of the Athenian war against Megara on the strength of a poem he wrote about Salamis Island. Supported by Pisistratus, he defeated the Megarians either by means of a cunning trick or more directly through heroic battle. The Megarians however refused to give up their claim to the island. The dispute was referred to the Spartans, who eventually awarded possession of the island to Athens on the strength of the case that Solon put to them.

When he was archon, Solon discussed his intended reforms with some friends. Knowing that he was about to cancel all debts, these friends took out loans and promptly bought some land. Suspected of complicity, Solon repaid the loans himself, amounting to 5 talents (or 15 according to some sources).

After he had finished his reforms, he travelled abroad for ten years, so that the Athenians could not induce him to repeal any of his laws. His first stop was Egypt. There, according to Herodotus he visited the Pharaoh of Egypt Amasis II. According to Plutarch he spent some time and discussed philosophy with two Egyptian priests, Psenophis of Heliopolis and Sonchis of Sais. According to Plato's dialogues Timaeus and Critias, he visited Neith's temple at Sais and received from the priests there an account of the history of Atlantis. Next Solon sailed to Cyprus, where he oversaw the construction of a new capital for a local king, in gratitude for which the king named it Soloi.
Solon's travels finally brought him to Sardis, capital of Lydia. According to Herodotus and Plutarch, he met with Croesus and gave the Lydian king advice, which however Croesus failed to appreciate until it was too late. Croesus had considered himself to be the happiest man alive and Solon had advised him, "Count no man happy until he be dead", because at any minute, fortune might turn on even the happiest man and make his life miserable. It was only after he had lost his kingdom to the Persian king Cyrus, while awaiting execution, that Croesus acknowledged the wisdom of Solon's advice.\[^{157}\][\[^{158}\]

After his return to Athens, Solon became a staunch opponent of Pisistratus. In protest and as an example to others, Solon stood outside his own home in full armour, urging all who passed to resist the machinations of the would-be tyrant. But his efforts were in vain. Solon died shortly after Pisistratus usurped by force the autocratic power that Athens had once freely bestowed upon him.\[^{159}\]

According to one account, he died in Cyprus and, in accordance with his will, his ashes were scattered around Salamis, the island where he was born.\[^{160}\][\[^{161}\]

The travel writer, Pausanias, listed Solon among the seven sages whose aphorisms adorned Apollo's temple in Delphi.\[^{162}\]

Stobaeus in the Florilegium relates a story about a symposium, where Solon's young nephew was singing a poem of Sappho's; Solon, upon hearing the song, asked the boy to teach him to sing it. When someone asked, "Why should you waste your time on it?" Solon replied ἵνα μαθὼν αὐτὸ ἀποθάνω, "So that I may learn it then die."\[^{163}\]

Ammianus Marcellinus however told a similar story about Socrates and the poet Stesichorus, quoting the philosopher's rapture in almost identical terms: "ut aliquid sciens amplius e vita discedam."\[^{164}\]

Notes

[7] V.Ehrenberg, From Solon to Socrates: Greek History and Civilization, Routledge (1973) 71
[12] Plutarch Solon 14 s.Lives (Dryden translation)/Solon#14
[13] Plutarch Solon 14.3 s.Lives (Dryden translation)/Solon#14
[14] Athenaiou Politieia 1.5 (e.g. Kenyon's translation s:Athenian Constitution#5)
Solon


[21] Plutarch Solon 13 s:Lives (Dryden translation)/Solon#13


[27] Thucydides 2.14 - 2.16.


[37] V.Ehrenberg, *From Solon to Socrates: Greek History and Civilization*, Routledge (1973) 71-72


[40] Oxford Classical Dictionary (1964), 'Draco'

[41] Plutarch Solon 17 s:Lives (Dryden translation)/Solon#17

[42] Plutarch Solon 25.1 s:Lives (Dryden translation)/Solon#25


[44] Athenaion Politeia 3.6 s:Athenian Constitution#3

[45] Athenaion Politeia 8.2 s:Athenian Constitution#8

[46] Athenaion Politeia 7.1, 55.5 s:Athenian Constitution#7

[47] Plutarch Solon 25.3 s:Lives (Dryden translation)/Solon#25


[49] Athenaion Politeia 7.3 s:Athenian Constitution#7

[50] Aristotle *Politics* 1274a 3, 1274a 15


[54] Athenaion Politeia 8.4 s:Athenian Constitution#8

[55] Plutarch Solon 19 s:Lives (Dryden translation)/Solon#19


[58] Plutarch Solon 18 s:Lives (Dryden translation)/Solon#18


[61] Athenaion Politeia 7-8 s:Athenian Constitution#7


[63] "In all areas then it was the work of Solon which was decisive in establishing the foundations for the development of a full democracy." — Marylin B. Arthur, *The Origins of the Western Attitude Toward Women*, in *Women in the Ancient World: The Arethusa Papers*, John Patrick Sullivan (ed.), State University of New York (1984), page 30.

"In making their own evaluation of Solon, the ancient sources concentrated on what were perceived to be the democratic features of the constitution. But...Solon was given his extraordinary commission by the nobles, who wanted him to eliminate the threat that the position of the nobles as a whole would be overthrown." — Stanton, G.R. *Athenian Politics c800-500BC: A Sourcebook*, Routledge, London (1990), p. 76.

[64] Thucydides 2.14 - 2.16


[70] Plutarch Solon 22.1 s: (Dryden translation)/Solon#22

[71] Plutarch Solon 24.4 s: (Dryden translation)/Solon#24

[72] 21. Plutarch Solon 24.1 s: (Dryden translation)/Solon#24

[73] V. Ehrenberg, From Solon to Socrates: Greek History and Civilization, Routledge (1973) 73-74


[75] Athenaios Politeia 10 s:Athenian Constitution#10

[76] Athenaios Politeia 10 s:Athenian Constitution#10

[77] Plutarch (quoting Androtion) Solon 15.2-5 s: (Dryden translation)/Solon#15


[81] Demosthenes 19 (On the Embassy) 254-5

[82] Athenaios Politeia 12.4 (quoting Solon) s:Athenian Constitution#12


[84] Innis H., Empire and Communications (Rowman and Littlefield, 2007) pages 91-92


[89] Athenaios Politeia 6 s:Athenian Constitution#6

[90] Plutarch Solon 15.2 s: (Dryden translation)/Solon#15

[91] Athenaios Politeia 12.4, quoting Solon s:Athenian Constitution#12

[92] Athenaios Politeia 6 s:Athenian Constitution#6

[93] Plutarch Solon 15.2 s: (Dryden translation)/Solon#15

[94] Athenaios Politeia 12.4, quoting Solon s:Athenian Constitution#12

[95] Solon quoted in Athenaios Politeia 12.4 s:Athenian Constitution#12


[98] Plutarch Solon 20.6 s: (Dryden translation)/Solon#20


[100] Athenaios Politeia 9 s:Athenian Constitution#9

[101] Plutarch Solon 18.6 s: (Dryden translation)/Solon#18

[102] Athenaios Politeia 8.5 s:Athenian Constitution#8


[104] Plutarch Solon 20.1 s: (Dryden translation)/Solon#20


[107] Demosthenes On Organization (http://www.4literature.net/Demosthenes/Oration_on_the_Regulation_of_the_State/

[108] .6. Herodotus 1.29 (e.g. Campbell's translation (http://www.gutenberg.org/etext/2707))

[109] Athenaios Politeia 7.2 s:Athenian Constitution#7


[111] Plutarch Solon 25.6 s: (Dryden translation)/Solon#25

[112] Athenaios Politeia 13 s:Athenian Constitution#13

[113] Plutarch Solon 30 s: (Dryden translation)/Solon#30

[114] Demosthenes 19 (On the Embassy) 254-5


[118] Plutarch Solon 3.1-4 s: (Dryden translation)/Solon#3
Solon

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[122] Plutarch Solon 1 s:Lives (Dryden translation)/Solon#1
[123] Plutarch Solon 16 s:Lives (Dryden translation)/Solon#16
[124] Plutarch Solon 8 s:Lives (Dryden translation)/Solon#8
[125] Diogenes Laertius 1.47
[126] Solon, quoted in Diogenes Laertius 1.47
[127] Plutarch Solon 9 s:Lives (Dryden translation)/Solon#9
[128] Fr. 4
[129] Rachel Adams, David Savran, The Masculinity Studies Reader; Blackwell, 2002; p.74
[130] One Hundred Years of Homosexuality: And Other Essays on Greek Love, p.101
[132] Eros and Greek Athletics By Thomas Francis Scanlon, p.213 "So it is clear that Solon was responsible for institutionalizing pederasty to some extent at Athens in the early sixth century."
[133] Aeschines, Against Timarchus 6, 25, 26 (http://www.fordham.edu/halsall/pwh/aeschines.html); compare also Plutarch, Solon 1.3.
[138] Homosexuality & Civilization By Louis Crompton, p.25
[140] Solon and Early Greek Poetry By Elizabeth Irwin p.272 n.24
[141] Ancient Greece By Matthew Dillon, Lynda Garland, p.475
[145] Plutarch Solon 1 s:Lives (Dryden translation)/Solon#1.
[146] Plutarch Solon 1 s:Lives (Dryden translation)/Solon#1
[147] Plutarch, Life of Solon, ch.2
[149] Plutarch Solon 8 s:Lives (Dryden translation)/Solon#8
[150] Plutarch Solon 9 s:Lives/Solom#9
[151] Plutarch Solon 9 s:Lives (Dryden translation)/Solon#9
[152] Plutarch Solon 15 s:Lives (Dryden translation)/Solon#15
[155] Plutarch Solon 26 s:Lives (Dryden translation)/Solon#26
[156] Plutarch Solon 26 s:Lives (Dryden translation)/Solon#26
[158] Plutarch Solon 28 s:Lives (Dryden translation)/Solon#28
[159] Plutarch Solon 32 s:Lives (Dryden translation)/Solon#32
[160] Diogenes Laertius 1.62
[162] Pausanias 10.24.1 (e.g. Jones and Omerod trans. (http://www.theoi.com/Text/Pausanias10B.html)).
[163] Stobaeus, III, 29, 58, taken from a lost work of Aelian.
[164] Ammianus Marcellinus 38.4
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• B. Sealey, 'Regionalism in Archaic Athens', *Historia*, 9, 1960
Collections of Solon's surviving verses

- H. Miltner *Fragmente / Solon*, Vienna (1955)

External links

- Plutarch, Parallel Lives, Solon (http://classics.mit.edu/Plutarch/solon.html)

Chilon of Sparta

Chilon of Sparta (Χίλων or Χείλων; 6th century BC) was a Lacedaemonian and one of the Seven Sages of Greece.

Early life

Chilon was the son of Damagetus, and lived towards the beginning of the 6th century BC.

Standing and influence

Herodotus \[1\] speaks of him as contemporary with Hippocrates, the father of Peisistratus, and Diogenes Laertius states that he was an old man in the 52nd Olympiad (572 BCE), and that he was elected of ephor in Sparta in the 56th Olympiad (556/5 BC). Alcidamas stated that he was a member of the Spartan assembly. \[2\] Diogenes Laertius even goes so far as to claim that Chilon was also the first person who introduced the custom of joining the ephors to the kings as their counselors. \[3\]

Chilon is said to have helped to overthrow the tyranny at Sicyon, which became a Spartan ally. He is also credited with the change in Spartan policy leading to the development of the Peloponnesian League in the sixth century BC. \[4\]
Sayings

Diogenes Laertius describes him as a writer of Elegiac poems, and attributes many sayings to him: [3]

• "Do not speak evil of the dead."
• "Honor old age."
• "Prefer punishment to disgraceful gain; for the one is painful but once, but the other for one's whole life."
• "Do not laugh at a person in misfortune."
• "If one is strong be also merciful, so that one's neighbors may respect one rather than fear one."
• "Learn how to regulate one's own house well."
• "Do not let one's tongue outrun one's sense."
• "Restrain anger."
• "Do not dislike divination."
• "Do not desire what is impossible."
• "Do not make too much haste on one's road."
• "Obey the laws."

Death

Another legend claims that he died of joy when his son gained the prize for boxing at the Olympic games, and that his funeral was attended by all the Greeks assembled at the festival. [3]

References

[1] Herodotus, i. 59
[3] Diogenes Laertius, i. 68-73

Further reading

• G.L. Huxley. Early Sparta, 1962
• The Lives and Opinions of the Eminent Philosophers, by Diogenes Laertius
• Pliny, 7, c. 33.

External links

• Diogenes Laërtius, Life of Chilon, translated by Robert Drew Hicks (1925).
Bias of Priene

Bias (Greek: Βίας ο Πριηνεὺς, 6th century BCE), the son of Teutamus and a citizen of Priene was a Greek philosopher. Satyrus puts him as the wisest of all the Seven Sages of Greece. He was renowned for his goodness.

One of the examples of his great goodness is the legend that says that he paid a ransom for some women who had been taken prisoner. After educating them as his own daughters, he sent them back to Messina, their homeland, and to their fathers.

Honours

Also it is said that when some fishermen found The Brazen Tripod on which was inscribed: "For the Wisest", the fathers of the damsels came into an assembly. They concluded that Bias was the wisest among all men, so the tripod was presented to him as a token of gratitude for all that he had done for the city. Bias refused the honor with the words: "Apollo is the wisest". Another author notes that he consecrated the tripod at Thebes to Hercules.

Some of his sayings

- "The naïve men are easily fooled."
- "Most people are evil."
- "All men are wicked."
- "It is difficult to bear a change of fortune for the worse with magnanimity."
- "Choose the course which you adopt with deliberation; but when you have adopted it, then persevere in it with firmness."
- "Do not speak fast, for that shows folly."
- "Love prudence."
- "Speak of the Gods as they are."
- "Do not praise an undeserving man because of his riches."
- "Accept of things, having procured them by persuasion, not by force."
- "Cherish wisdom as a means of traveling from youth to old age, for it is more lasting than any other possession."
Work

It is said that he was very energetic and eloquent when pleading causes; but that he always reserved his talents for the right side. In reference to which Demodicus of Alerius uttered the following enigmatical saying—"If you are a judge, give a Prienian decision." And Hipponax says, "More excellent in his decisions than Bias of Priene." (Diogenes Laertius, Book I, Chapter: The Life of Bias)

He also wrote about 2,000 verses on Ionia, to show in what matter a man might achieve happiness.

Death

The legend says that he died as an old man, pleading a cause for his client. After he had finished speaking, he leaned back with his head on the bosom of his daughter's son. When the advocate on the opposite side had spoken, the judges decided in favor of Bias's client. At the end of the trial he was found dead on his grandson's bosom. The city buried him in the greatest magnificence.

Vatican bust

In April, 1819, Schopenhauer wrote in his Reisebuch [Travel Diary]: "In the Vatican [Hall of Philosophers] there is the bust of Bias with the inscription of πλεichick άνθρωποι κακοί [most men are bad]. Indeed this must have been his maxim."[1]

Notes


References and external links

• Diogenes Laërtius, Life of Bias, translated by Robert Drew Hicks (1925).
Cleobulus

Cleobulus (Greek: Κλεόβουλος, Kleoboulos; 6th century BC) was a Greek poet and a native of Lindos, and one of the Seven Sages of Greece.

Life

Cleobulus was the son of Evagoras and a citizen of Lindus in Rhodes[1] Clement of Alexandria calls Cleobulus king of the Lindians,[2] and Plutarch speaks of him as the tyrant.[3] The letter quoted by Diogenes Laertius, in which Cleobulus invites Solon to Lindus as a democratic place of refuge from the tyrant Peisistratus in Athens, is undoubtably a later forgery.[4] Cleobulus is also said to have studied "philosophy" in Egypt. He had a daughter named Cleobulina, who used to compose enigmas in hexameter verse, that were said to be of no less significance than his own. He is said to have lived to the age of seventy, and to have been greatly distinguished, for strength and beauty of person. There is a tomb of Cleobulus on Lindos.

Works

Cleobulus apparently wrote lyric poems, as well as riddles in verse. Diogenes Laertius also ascribes to him the inscription on the tomb of Midas, of which Homer was considered by others to have been the author:[5]

"I am a brazen maiden lying here
Upon the tomb of Midas. And as long
As water flows, as trees are green with leaves,
As the sun shines and eke the silver moon,
As long as rivers flow, and billows roar,
So long will I upon this much wept tomb,
Tell passers by, "Midas lies buried here."

Many sayings were attributed to him:[6]

• "Ignorance and talkativeness bear the chief sway among men."
• "Cherish not a thought."
• "Do not be fickle, or ungrateful."
• "Be fond of hearing rather than of talking."
• "Be fond of learning rather than unwilling to learn."
• "Seek virtue and eschew vice."
• "Be superior to pleasure."
• "Instruct one's children."
• "Be ready for reconciliation after quarrels."
• "Avoid injustice."
• "Do nothing by force."
• "Moderation is the best thing."
Pittacus of Mytilene

Pittacus (Greek: Πιττάκος) (c. 640-568 BCE) was the son of Hyrradius and one of the Seven Sages of Greece. He was a native of Mytilene and the Mytilenaean general who, with his army, was victorious in the battle against the Athenians and their commander Phrynon. In consequence of this victory the Mytilenaeans held Pittacus in the greatest honour and presented the supreme power into his hands. After ten years of reign he resigned his position and the city and constitution were brought into good order.

When the Athenians were about to attack his city, Pittacus challenged their General to a single combat, with the understanding that the result should decide the war, and much bloodshed be thereby avoided. The challenge was accepted, and he killed his enemy with a broad sword. He was then chosen ruler of his city and governed for ten years, during which time he made laws in poetry -- one of which was to this effect: "A crime committed by a person when drunk should receive double the punishment which it would merit if the offender were sober." His great motto was: "Do not to your neighbor what you would take ill from him."[1] (The Golden Rule)

Some authors mention that he had a son called Tyrrhaeus. The legend says that his son was killed and when the murderer was brought before Pittacus, he dismissed the man, saying, "Pardon is better than repentance." Of this matter, Heraclitus says that he had got the murderer into his power and then he released him, saying, "Pardon is better than punishment."

It was a saying of Pittacus, that it is a hard thing to be really a good man. Others of his sayings were:

- "Whatever you do, do it well."
- "Even the Gods cannot strive against necessity."
- "Power shows the man."
- "Do not say beforehand what you are going to do; for if you fail, you will be laughed at."
"Do not reproach a man with his misfortunes, fearing lest Nemesis may overtake you."
"Forbear to speak evil not only of your friends, but also of your enemies."
"Cultivate truth, good faith, experience, cleverness, sociability, and industry."
"Know thy opportunity"

He flourished about the forty-second Olympiad. Having lived more than seventy years, he died in the third year of the fifty-second Olympiad (568 BCE).

In Protagoras (dialogue) 341c[2] of Plato, Prodicus labeled the aeolic dialect as barbarian, while referring to Pittacus of Mytilene.

He didn't know to distinguish the words correctly, being from Lesbos, and having been raised with a barbarian dialect.

References

[1] Pittacus, Fragm. 10.3

Diogenes Laërtius, Life of Pittacus, translated by Robert Drew Hicks (1925).

Periander
**Periander** (Greek: Περίανδρος) was the second tyrant of Corinth, Greece in the 7th century BC. He was the son of the first tyrant, Cypselus. Periander succeeded his father in 627 BC. He died in 585 BC.

He upgraded Corinth's port, and built a ramp across the Isthmus of Corinth so that ships could be dragged across (the Diolkos), avoiding the sea route around the Peloponnese. The money gained from the *dolkos* allowed Periander to abolish taxes in Corinth. However, Periander was later considered the typical evil tyrant (for example, by Aristotle). Herodotus says he learned his "savagery" from Thrasybulus, the tyrant of Miletus, who instructed Periander to get rid of anyone who could conceivably take power from him. Among his acts were sending young boys from Corcyra to be castrated in Lydia (who are reputed to have escaped and be rescued by the Samians), and the murder (and possible necrophiliac rape) of his own wife, Melissa. Abhorrence for this act was so intense that it was described only metaphorically at the time: "Periander baked his bread in a cold oven" (Herodotus, V 91-93). Their son Lycophron discovered that his father was the murderer, so Periander exiled him from Corinth and forbade any of his subjects to shelter him. Periander later tried to reconcile with Lycophron, but Lycophron refused to return unless Periander abdicated. At this point, Periander declared he would abdicate in favour of Lycophron while he would rule Corcyra; however, the inhabitants of Corcyra killed Lycophron to prevent Periander from arriving.

Periander's nephew Psammetichus succeeded him as tyrant of Corinth but Psammetichus' rule only lasted three years and he was the last of the Cypselid dynasty. Periander was listed by most authors as one of the Seven Sages of Greece. According to Herodotus, Periander also held the musical contest that was won by the poet Arion. Periander invented the Railway albeit horse-drawn, aforementioned as the "Dolkos".

**External links**

Others

Diogenes of Apollonia

Diogenes of Apollonia (fl. 425 BC) was an ancient Greek philosopher, and was a native of the Milesian colony Apollonia in Thrace. He lived for some time in Athens. His doctrines are known chiefly from Diogenes Laërtius and Simplicius. He believed air to be the one source of all being, and, as a primal force, it was intelligent. All other substances are derived from it by condensation and rarefaction. Aristotle has preserved a lengthy passage concerning the organization of the blood vessels.

Life

Diogenes was a native of the Milesian colony Apollonia in Thrace, present-day Sozopol on the Black Sea. His father's name was Apollothemis. Nothing is known of the events in his life, except that he lived some time in Athens. Diogenes Laërtius states that "great jealousy nearly put his life in danger in Athens," but there may be confusion with Anaxagoras who is mentioned in the same passage. Like all the physiologi (physical philosophers), he wrote in the Ionic dialect. In The Clouds of Aristophanes, the views of Diogenes are transferred to Socrates.

Works

His most famous work was On Nature (Peri Physeos), some fragments of which are preserved, chiefly by Simplicius. Diogenes, like Anaximenes, believed air to be the one source of all being, and all other substances to be derived from it by condensation and rarefaction. This he modified by the theories of his contemporary Anaxagoras, and asserted that air, the primal force, was intelligent:

And it seems to me that that which possessed thought is what people call air, and that by this everyone both is governed and has power over everything. For it is this which seems to me to be god and to have reached everything and to arrange everything and to be in everything. And there is not a single thing which does not share in it.

The nature of the universe is air, limitless and eternal, from which, as it condenses and rarefies and changes its properties, the other forms come into being. Among his other doctrines, he is said to have believed that there was an infinite number of worlds, and infinite void; that air, densified and rarefied, produced the different worlds; that nothing was produced from nothing, or was reduced to nothing; that the Earth was round, supported in the middle, and had received its shape from the whirling round of the warm vapours, and its concretion and hardening from cold.

The longest surviving fragment of Diogenes is that which is inserted by Aristotle in the third book of his History of Animals. It contains a description of the distribution of the blood vessels in the human body. It is notable chiefly because "here we can read at first hand what in the case of the other Presocratics we learn only indirectly: an attempt to describe in scientific detail the structure and organization of the physical world.

Diogenite meteorites are named for Diogenes of Apollonia, who was the first to suggest an outer space origin for meteorites:

With the visible stars revolve stones which are invisible, and for that reason nameless. They often fall on the ground and are extinguished, like the stone star that came down on fire at Aegospotami.
References

[1] Kirk, Raven, & Schofield, *The Presocratic Philosophers* (Cambridge, 1983, 2nd edition), p. 434. The alternative view, not accepted by many modern scholars, is that the Apollonia in question was the Cretan city that originally was Eleutherna.

[2] Diogenes Laërtius, ix. 57


[8] Aetius, ii. 13. 9

Bibliography


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Aristeas

*Aristeas* (Greek: Ἀριστέας) was a semi-legendary Greek poet and miracle-worker, a native of Proconnesus in Asia Minor, active ca. 7th century BCE. In book IV of *The Histories*, Herodotus reports

> The birthplace of Aristeas, the poet who sung of these things, I have already mentioned. I will now relate a tale which I heard concerning him both at Proconnesus and at Cyzicus. Aristeas, they said, who belonged to one of the noblest families in the island, had entered one day into a fuller's shop, when he suddenly dropt down dead. Hereupon the fuller shut up his shop, and went to tell Aristeas' kindred what had happened. The report of the death had just spread through the town, when a certain Cyzicenian, lately arrived from Artaca, contradicted the rumour, affirming that he had met Aristeas on his road to Cyzicus, and had spoken with him. This man, therefore, strenuously denied the rumour; the relations, however, proceeded to the fuller's shop with all things necessary for the funeral, intending to carry the body away. But on the shop being opened, no Aristeas was found, either dead or alive. Seven years afterwards he reappeared, they told me, in Proconnesus, and wrote the poem called by the Greeks The Arimaspeia, after which he disappeared a second time. This is the tale current in the two cities above-mentioned.

Two hundred and forty years after his death, Aristeas appeared in Metapontum in southern Italy to command that a statue of himself be set up and a new altar dedicated to Apollo, saying that since his death he had been travelling with Apollo in the form of a sacred raven.
Aristeas

Aristeas was supposed to have authored a poem called the *Arimaspea*, giving an account of travels in the far North. There he encountered a tribe called the Issedones, who told him of still more fantastic and northerly peoples: the one-eyed Arimaspi who battle gold-guarding griffins, and the Hyperboreans among whom Apollo lives during the winter.

Longinus excerpts a portion of the poem:

> A marvel exceeding great is this withal to my soul—
> Men dwell on the water afar from the land, where deep seas roll.
> Wretches are they, for they reap but a harvest of travail and pain,
> Their eyes on the stars ever dwell, while their hearts abide in the main.
> Often, I ween, to the Gods are their hands upraised on high,
> And with hearts in misery heavenward-lifted in prayer do they cry.[1]

Similarly, the Chiliades of Ioannis Tzetze quotes the *Arimaspea*. These two account for our entire knowledge of the poem, which is otherwise lost.

In popular culture

This story appears to be referred to in Neil Gaiman's Sandman comics: *Aristeas* was a poet who lived around 700 BCE, and became by transformation one of many ravens who have acted as both adviser and assistant to The Endless known as Dream. Not to be confused with the raven Matthew, the main raven in the Sandman tale, who existed in human form in the Swamp Thing continuity before his time as a resident of the Dreaming.

References


Pherecydes of Syros

See also Pherecydes of Leros

Pherecydes of Syros (Φερεκύδης)

Pherecydes, ancient Greek philosopher.

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Pherecydes of Syros (in Greek: Φερεκύδης) was a Greek thinker from the island of Syros, of the 6th century BC. Pherecydes authored the Pentemychos or Heptamychos, one of the first attested prose works in Greek literature, which formed an important bridge between mythic and pre-Socratic thought.

Life

Very little is known of his life. The sources are often contradictory.[1] It has been said that he was a son of Babys, and that he was most likely active in ca. 540 BC.

Pentemychos or Heptamychos

Note that Pherecydes' book is called "Heptamychos" ("seven recesses") in the Suda and in all modern sources.[2] In this work, Pherecydes taught his philosophy through the medium of mythic representations. Although it is lost, the fragments that survive are enough to reconstruct a basic outline. Aristotle in *Metaphysics*[3] thus characterized Pherecydes' work as a mixture of myth and philosophy.

Creation of the world

In the older cosmogony of Hesiod (8th-7th century BC) the initial state of the universe is Chaos, a dark void considered as a divine primordial condition and the creation is *ex nihilo* (out of nothing). Pherecydes probably interpreted *chaos* as water and he does not place it at the very beginning. In his cosmogony there are three divine principles, Zas (Zeus), Cthonie (chthonios) and Chronos (time) who always existed. The semen (seeds) of Chronos which can probably be considered as a *watery chaos* was placed in the recesses and composed numerous other...
Pherecydes of Syros

This is described in a fragment preserved in Damascius' "De Principis".

A close relationship is thought to exist between these recesses and Chthonie, which is another of the three first-existing things. Chthonie has to do with the origin of the word "chthonic"; her name means "underlying the earth". Hesiod described Tartaros as being "in a mychos of broad-wayed earth," through which we may guess at a close affinity between krater, mychos, and Chthonie. Professor Hermann S. Schibli, author of the most acclaimed academic book on Pherecydes, thinks the five mychos were actually harboured within Chthonie, or at least were so initially when Chronos disposed his seed in the five "nooks".

Alongside Chthonie and Chronos, Pherecydes held a power called Zas. Zas is thought to be a strange etymological form of Zeus, and to be identical with he Orphic Eros in function, and as such a personification of masculine, or simply sexual, creativity. Proclus said that "Pherecydes used to say that Zeus changed into Eros when about to create, for the reason that, having created the world from opposites, he led it into agreement and peace and sowed sameness in all things, and unity that interpenetrates the universe." The act of creation itself (perhaps it is more accurate to say that Chronos creates—it is from his seed that the actual "stuff" comes from—and that Zas orders and distributes) is described mytho-poetically as Zas making a cloth on which he decorates earth and sea, and which he then presents as a wedding gift to Chthonie, and wraps around her. Yet, in another fragment it is not Chthonie, but "a winged oak" that he wraps the cloth around.

The stories are not mutually exclusive, simply different. The chronology is hard to figure out because much is lacking in the fragments, but one thing is clear, and that is that creation is hindered by chaotic forces. Before the world is ordered a cosmic battle takes place, with Kronos (ordered time) as the head of one side and Ophioneus as the leader of the other. The same story is elsewhere enacted with Zeus and Typhon/Typhoeus as leading characters, and it also has close parallels in many myths from cultures other than the Greek (Marduk vs. Tiamat, etc). Ophioneus and its brood are often depicted as ruling the birthing cosmos for some time, before falling from power. The chaotic forces are eternal and cannot be destroyed; instead they are thrown out from the ordered world and locked away in Tartaros in a kind of "appointment of the spheres", in which the victor (Zeus-Kronos) takes possession of the sky and of space and time. The locks to Tartaros are fashioned in iron by Zeus, and might hence have been associated with his element of aither, and in bronze by Poseidon, which might indicate a link to water (which was often conceived of as the "first matter"). Judging from some ancient fragments Ophioneus is thrown into Okeanos, not into Tartaros.

Exactly what entities or forces that were locked away in Pherecydes’ story cannot be known for sure, unless his book were to be miraculously recovered. Good guesswork would be to have five principal figures. We know that Ophioneus, or Typhon, was one and the same. We also know that Eurynome fought on the side of Ophioneus against Kronos. That Chthonie is a principal "thing" of the underworld is almost superfluous to argue, but whether she is to be counted as one of the five or the five "sum-total" is more of an open question. Apart from these we know that Ophioneus-Typhon mated with Echidna, and that Echidna herself was somehow mysteriously "produced" by Callirhoe. If Pherecydes counted five principal entities in association the pentemychos doctrine, then Ophioneus, Eurynome, Echidna, Callirhoe and Chthonie are the main contenders.
As said, Kronos is replaced by Zeus in the more popularly known version, but the overall story remains the same. Kronos/Zeus orders the offspring out from the cosmos to Tartaros. There they are kept behind locked gates, fashioned in iron (associated with Zeus and his element of sky/space) and bronze (by Poseidon—the water force). We are told about chaotic beings put into the pentemychos, and we are told that the Darkness has an offspring that is cast into the recesses of Tartaros. A fragment exclusively making the equation for us is lacking, but it does indeed seem very, very plausible that the prison-house in Tartaros and the pentemychos are ways of referring to the essentially same thing. According to Celcus, Pherecydes said that: "Below that portion is the portion of Tartaros; the daughters of Boreas [the north wind], the Harpies and Thuella [Storm], guard it; there Zeus banished any of the gods whenever one behaves with insolence."[6] Considering this statement, Pherecydes' own words, the identity between Zeus' prison-house and the pentemychos seems exceedingly likely.

Pherecydes' "Pentemychos" is thought to have contained a mystical esoteric teaching, treated allegorically. One ancient commentator said that:

"Also, Pherecydes, the man of Syros, talks of recesses and pits and caves and doors and gates, and through these speaks in riddles of becomings and deceases of souls."[11]

A comparatively large number of sources say Pherecydes was the first to teach the eternality and transmigration of human souls. "[12] That he was the first to teach such a thing is doubtful, but that he was among the first and that he did profess this teaching is certain. Professor Hermann S. Schibli, the most acclaimed scholar on Pherecydes, concludes that Pherecydes "included in his book ["Pentemychos"] at least a rudimentary treatment of the immortality of the soul, its wanderings in the underworld, and the reasons for the soul's incarnations".[13]

Astronomy

Aside from his writing, Pherecydes is known for having made a sundial on the island of Syros[14]. The Science Center & Technology Museum of Thessaloniki[15] website informs us:

- A 'heliotropion', or 'shadow-chaser': The first example of this instrument, which was a more advanced kind of gnomon used to determine midday and to calculate the length of the year and the geographical latitude, was built by Pherecydes in Samos.

Pherecydes predicted lunar and solar eclipses.
**Influence**

Pherecydes' contribution to the early Presocratic thought is (1) the denial of ex nihilo creation; (2) cosmos self-creation; (3) the eternal nature of the first principles. Both Cicero and Augustine thought that Pherecydes of Syros first taught the immortality of the soul. Diogenes Laertius writes that some considered Pherecydes to have been the teacher of Pythagoras. He is occasionally counted among the Seven Sages of Greece.

**References**


**External links**

- [Pherecydes of Syros](http://www.philosophy.gr/presocratics/pherecydes.htm) by Giannis Stamatellos
Anacharsis

"He marvelled that among the Greeks, those who were skillful in a thing vie in competition; those who have no skill, judge"
—Diogenes Laertius, of Anacharsis.

Anacharsis (Greek: Ἀνάχαρσις) was a Scythian philosopher who travelled from his homeland on the northern shores of the Black Sea to Athens in the early 6th century BCE and made a great impression as a forthright, outspoken "barbarian", apparently a forerunner of the Cynics, though none of his works have survived.

Life

Anacharsis the son of Gnurus, a Scythian chief, was half Greek and from a mixed Hellenistic culture, apparently in the region of the Cimmerian Bosporus. He left his native country to travel in pursuit of knowledge, and came to Athens about 589 BCE, at a time when Solon was occupied with his legislative measures.

According to the story recounted by Hermippus, he arrived at the house of Solon and said, "I have traveled here from afar to make you my friend." Solon replied, "It's better to make friends at home." Thereupon the Scythian replied, "Then it is necessary for you, being at home, to make friends with me." Solon laughed and accepted him as his friend.

He cultivated the outsider's knack of seeing the illogic in familiar things. His conversation was droll and frank, and Solon and the Athenians took to him as a sage and philosopher. His rough and free discourse became proverbial among Athenians as 'Scythian discourse'.

Anacharsis was the first foreigner (metic) who received the privileges of Athenian citizenship. He was reckoned by some ancient authors as one of the Seven Sages of Greece, and it is said that he was initiated into the Eleusinian Mysteries of the Great Goddess, a privilege denied to those who did not speak fluent Greek.

According to Herodotus, when Anacharsis returned to the Scythians he was killed by his own brother for his Greek ways and especially for the impious attempt to sacrifice to the Mother Goddess Cybele, whose cult was unwelcome among the Scythians.
Ideas

None of the works ascribed to him in ancient times, if indeed they were written by him, have survived. He was said to have written a book comparing the laws of the Scythians with the laws of the Greeks, as well as work on the art of war. All that remains of his thought is what later tradition ascribes to him. He became famous for the simplicity of his way of living and his acute observations on the institutions and customs of the Greeks. He exhorted moderation in everything, saying that the vine bears three clusters of grapes: the first wine, pleasure; the second, drunkenness; the third, disgust.[7] So he became a kind of emblem to the Athenians, who inscribed on his statues: 'Restrain your tongues, your appetites, your passions.'

There are ten extant letters ascribed to him, one of which is also quoted by Cicero:

Greetings from Anacharsis to Hanno: My clothing is a Scythian cloak, my shoes are the hard soles of my feet, my bed is the earth, my food is only seasoned by hunger - and I eat nothing but milk and cheese and meat. Come and visit me, and you will find me at peace. You want to give me something. But give it to your fellow-citizens instead, or let the immortal gods have it.[8]

All of the letters are spurious.[9] The first nine probably date from the 3rd century BCE, they are usually included among the Cynic epistles, and reflect how the Cynic philosophers viewed him as prefiguring many of their ideas;[9] the tenth letter is quoted by Diogenes Laertius, it is addressed to Croesus, the proverbially rich king of Lydia, it too is fictitious:

Anacharsis to Croesus: O king of the Lydians, I am come to the country of the Greeks, in order to become acquainted with their customs and institutions; but I have no need of gold, and shall be quite contented if I return to Scythia a better man than I left it. However I will come to Sardis, as I think it very desirable to become a friend of yours.[10]

Strabo makes him the (probably legendary) inventor of the anchor with two flukes, and others made him the inventor of the potter's wheel.[10]

Having been informed that Solon was employed to draw up a code of laws for the Athenians, Anacharsis described his occupation, saying:

"Laws are spider-webs, which catch the little flies, but cannot hold the big ones."[11]

Revival in the 18th century

In 1788 Jean Jacques Barthelemy (1716–95), a highly esteemed classical scholar and Jesuit, published The Travels of Anacharsis the Younger in Greece, about a young Scythian descended from Anacharsis. The 4-volume work was an imaginary travel journal, one of the first historical novels, which a modern scholar has called "the encyclopedia of the new cult of the antique" in the late 18th century. It had an impact on the growth of philhellenism in France at the time. The book went through many editions, was reprinted in the United States and translated into German and other languages. It later inspired European sympathy for the Greek struggle for independence and spawned sequels and imitations through the 19th century.
Notes

[1] Herodotus, iv. 76; Diogenes Laertius, i. 101; although Lucian, *Scytha* calls him the son of Daucetas.
[2] Sosicrates, ap Diogenes Laertius, i. 101
[4] Diogenes Laertius, i. 101
[5] Diogenes Laertius, i. 41-2
[6] Herodotus, iv. 76; comp. Diogenes Laertius, i. 102
[7] Diogenes Laertius, i. 103
[10] Diogenes Laertius, i. 105

Classical references


External links
