DOWNLOAD PDF THE WORLD IN THE HAND : ANAXIMANDER, PHERECYDES, AND THE INVENTION OF CARTOGRAPHY

Chapter 1 : Anaximander | Revolvy

Get this from a library! Space and Time in Ancient Greek Narrative.. [Alex C Purves] -- Traces a shift in authorial perspective in ancient Greek narrative inspired by advances in cartography, travel, and geometry.

Anaximander Save Anaximander ; Greek: 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, arguably, Pythagoras amongst his pupils. According to available historical documents, he is the first philosopher known to have written down his studies,[6] although only one fragment of his work remains. Fragmentary testimonies found in documents after his death provide a portrait of the man. 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. In astronomy , he attempted 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. This could be a representation of Anaximander leaning towards Pythagoras on his left. Themistius , a 4th-century Byzantine rhetorician , mentions that he was the "first of the known Greeks to publish a written document on nature. 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. 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. Anaximander lived the final few years of his life as a subject of the Persian Achaemenid Empire. 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, and therefore could fit their ideas into a tolerably elastic system. The basic elements of nature water , air , fire , earth which the first Greek philosophers believed constituted the universe represent in fact the primordial forces of previous thought. Their collision produced what the mythical tradition had called cosmic harmony. Anaximander claimed that the cosmic order is not monarchic but geometric , and that 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. The decisions are now taken by the assembly of demos in the agora which is lying in the middle of the city. Origin, then, must be something else unlimited in its source, that could create without experiencing decay, so that genesis would never stop. 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. III 3â€”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. 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. 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. 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. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements: 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,[28] and by the Greek tragedian Euripides: It confirms that pre-Socratic philosophers were making an early effort to demystify physical processes. His major contribution to history was writing the oldest prose document about the Universe and the origins of life ; for this he is often called the "Father of Cosmology " and founder of astronomy. However, pseudo-Plutarch states that he still viewed celestial bodies as deities. 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. The flat top forms the inhabited world, which is surrounded by a circular oceanic mass. On the left, daytime in summer; on the right, nighttime in winter. However, Anaximander pictured the earth as a truncated cylinder, not as a sphere as shown. 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 [38] 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,[39] followed the same model. 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". Cicero writes that he attributes different gods to the countless worlds. 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. 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. 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. 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. 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. Only some small examples survived until today. The unique example of a world map comes from late Babylonian tablet BM later than 9th century BC but is based probably on a much older map. These maps indicated directions, roads, towns, borders, and geological features. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. 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. 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. 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 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 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, , 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. 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. Anaximander seems to express his belief that a natural order ensures balance between these elements, that where there was fire, ashes earth now exist. 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.

Chapter 2 : Space and Time in Ancient Greek Narrative : Alex C. Purves :

Introduction: the perfect surveyor --The eusynoptic Iliad: visualizing space and movement in the poem --Paths and measures: epic space and the Odyssey --The world in the hand: Anaximander, Pherecydes, and the invention of cartography --Map and narrative: Herodotus's histories --Losing the way home: Xenophon's Anabasis --Finding (things at.

All pre-socratic philosophy, in particular: 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, arguably, Pythagoras amongst his pupils. According to available historical documents, he is the first philosopher known to have written down his studies, [5] although only one fragment of his work remains. Fragmentary testimonies found in documents after his death provide a portrait of the man. 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. In astronomy , he attempted 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. This could be a representation of Anaximander leaning towards Pythagoras on his left. Themistius , a 4th-century Byzantine rhetorician , mentions that he was the "first of the known Greeks to publish a written document on nature. 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. 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. Indeed, Various History III, 17 explains that philosophers sometimes also dealt with political matters. 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. 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. 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. The decisions are now taken by the assembly of demos in the agora which is lying in the middle of the city. Origin, then, must be something else unlimited in its source, that could create without experiencing decay, so that genesis would never stop. 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. 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. This arche is called "eternal and ageless". 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. He postulated the apeiron as a substance that, although not directly perceptible to us, could explain the opposites he saw around

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Chapter 3 : Alex Purves | University of California, Los Angeles - calendrierdelascience.com

Anaximander, son of Praxiades, was born in the third year of the 42nd Olympiad (BC). According to Apollodorus of Athens, Greek grammarian of the 2nd century BC, he was sixty-four years old during the second year of the 58th Olympiad (BC), and died shortly afterwards.

He belonged to the Milesian school and learned the teachings of his master Thales. He succeeded him 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,[2] although only one fragment of his work remains. Fragmentary testimonies found in documents after his death provide a portrait of the man. 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. In astronomy, he tried to describe the mechanics of celestial bodies in relation to the Earth. In physics, he postulated that the indefinite or apeiron was the source of all things. 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 as he was sent as a leader to one of its colonies. With his assertion that physical forces, rather than supernatural means, create order in the universe, Anaximander can be considered the first true scientist. He is known to have conducted the earliest recorded scientific experiment. Themistius, a 4th century Byzantine rhethorician, mentions that he was the "first of the known Greeks to publish a written document on nature" and 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. 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. Indeed, Various History III, 17 explains that philosophers sometimes left the contentment of their thoughts to deal with political matters. Anaximander, son of Praxiades, was born in Miletus during the third year of the 42nd Olympiad BC. For him, it became no longer a mere point in time, but a source that could perpetually give birth to whatever will be. 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. 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. 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. 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. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements: This concept of returning to the element of origin was often revisited afterwards, notably by Aristotle,[11] and by the Greek tragedian Euripides: It confirms that pre-Socratic philosophers were making an early effort to demythify physical processes. His major contribution to history was writing the oldest prose document about the Universe and the origins of life; for this he is often called the "Father of Cosmology" and

founder of astronomy. However, pseudo-Plutarch states that he still viewed celestial bodies as deities. 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. 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. On the left, daytime in summer; on the right, nighttime in winter. 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. 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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. 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": This is the very principle of scientific thought, which was later advanced further by improved research methods. 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. They indicated roads, towns, borders, and geological features. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. 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. 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. 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. 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 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, , 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. 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. Anaximander seems to express his belief that a natural order ensures balance between these elements, that where there was fire, ashes earth now exist. 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 " The lecture examines the ontological difference and the oblivion of Being or Dasein in the context of the Anaximander fragment.

Chapter 4 : My Little Occult Shop: Lecture: pre-Socratic Greek philosopher Anaximander

Anaximander, a Greek philosopher, created the first map of the world which included Europe, Asia, Libya, and the Mediterranean and Black Seas. He believed and showed that the earth was cylindrical and suspended in space.

This could be a representation of Anaximander leaning towards Pythagoras on his left. Themistius , a 4th-century Byzantine rhetorician , mentions that he was the "first of the known Greeks to publish a written document on nature. 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. 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. Anaximander lived the final few years of his life as a subject of the Persian Achaemenid Empire. 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, and therefore could fit their ideas into a tolerably elastic system. The basic elements of nature water , air , fire , earth which the first Greek philosophers believed constituted the universe represent in fact the primordial forces of previous thought. Their collision produced what the mythical tradition had called cosmic harmony. Anaximander claimed that the cosmic order is not monarchic but geometric , and that 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. The decisions are now taken by the assembly of demos in the agora which is lying in the middle of the city. Origin, then, must be something else unlimited in its source, that could create without experiencing decay, so that genesis would never stop. 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. III 3â€”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. 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. 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. 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. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements: 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, [28] and by the Greek tragedian Euripides: It confirms that pre-Socratic philosophers were making an early effort to demystify physical processes. His major contribution to history was writing the oldest prose document about the Universe and the origins of life ; for this he is often called the "Father of Cosmology " and founder of astronomy. However, pseudo-Plutarch states that he still viewed celestial bodies as deities. 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. The flat top forms the inhabited world, which is surrounded by a circular oceanic mass. On the left, daytime in summer; on the right, nighttime in winter. However, Anaximander pictured the earth as a truncated cylinder, not as a sphere as shown. 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 [38] 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, [39] followed the same model. 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[edit] 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". Cicero writes that he attributes different gods to the countless worlds. 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[edit] Anaximander attributed some phenomena, such as thunder and lightning , to the intervention of elements, rather than to divine causes. 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. Origin of humankind[edit] Anaximander speculated about the beginnings and origin of animal life. Taking into account the existence of fossils[dubious â€” discuss], 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. 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. 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. Only some small examples survived until today. The unique example of a world map comes from late Babylonian tablet BM later than 9th century BC but is based probably on a much older map. These maps indicated directions, roads, towns, borders, and geological features. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. 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. 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[edit] 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. 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 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 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[edit] In his philosophical work De Divinatione I, 50, , 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. 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. Anaximander seems to express his belief that a natural order ensures balance between these elements, that where there was fire, ashes earth now exist. 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 " The lecture examines the ontological difference and the oblivion of Being or Dasein in the context of the Anaximander fragment.

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The world in the hand: Anaximander, Pherecydes, and the invention of cartography; 4. "Space and Time in Ancient Greek Narrative is a demanding, yet rewarding read.

Depicts Babylon on the Euphrates, surrounded by landmasses depicting Assyria, Urartu, and other cities. Those landmasses are surrounded by Oceanus translated as a "bitter river" and seven islands are around it in a seven pointed star. According to later Greek philosophers and thinkers, Anaximander was one of the first advocates for understanding natural phenomenon from a scientific standpoint. Strabo and Agatheremus, greek geographers, claimed that the first map of the world was by Anaximander. Previous representations of local geographies existed, but Anaximander was supposedly the first to create a global map depicting placement in the whole world. The map was reportedly circular, with the Aegean sea at its center. The map projection extends great circles as straight lines, by casting surface points of the sphere onto a tangent plane. This leads to increased distortion as the map travels away from the point of tangency with the sphere. The Asia one describes countries and inhabitants of areas of Asia known to him, and includes a particularly detailed description of Egypt. There are surviving fragments of the work. The Europe one is a coastal survey of the Mediterranean, describing every region. This is an s reconstruction of the map. Written about by Strabo in BC, in such a way as to suggest that Strabo had a copy of a world map or globe before him as he wrote. He traveled around the Greco-Roman world of the time, and estimated the circumference of the earth with near accuracy based on his observations of the star Canopus. This was similar to the measurement of Eratasthones made by measuring levels of the sun. However, Strabo later recalculated his mapping to bring his measurement down to approx. This measurement became a point of debate among scholars of the middle ages. Date is approximate, based on range of BCE. His work contained maps of Europe, and the written portion informed later world maps that were credited to Strabo. Date approximate based on lifetime of 64 - 24 BCE. However, he was unique in that he claimed the zone below the zone below the European zone was inhabited. Discovered in the 16th century by German scholars. However, he attempted to refute previous cartographers, mathematicians, and scientists by asserting that the world is flat, not round, and that the sky takes the form of a curved lid over the world. He claimed the earth was modeled on the shape of the tabernacle, the house of worship as described to Moses by God. First T and O map CE Described initially by Isidore of Sevilla, the T and O map took a more christian representation of the world by drawing the seas as a "t"shape, and the three known continents as the spaces divided within the O by the T. This created a depiction of a cross. Places and their distances apart could be drawn on the continents themselves. However, this is a markedly symbolic map, and not an accurate geographic representation. His world map is more representative of his travels than it is geographically accurate; however, he appears to be one of the first major cartographers to travel south of the equator and to assert the existence of native people in areas the Greeks had written off. Similar to other maps of the time, particularly Christian ones, it is very symbolic with East at the top although it does not have Jerusalem near the center and there is no indication of any Garden of Eden. Beatus Mappa Mundi Beatus of Liebana was an austrian monk and the author of the work Commentary on the Apocalypse. It was the most accurate map drawn to date and remained most accurate for some time. However, he still extended the east coast of Africa, which was odd given that he had knowledge of sailors sailing down past the coast and around the Saudi peninsula. This was another instance of intellectuals such as al-Idrisi preferring to trust the knowledge of their predecessors, such as Ptolemy, over colloquial knowledge of uneducated although experienced sailors. Ebstorf Mappa Mundi One of the largest early world maps, the Ebstorf world map measures about 3 and a half meters squared. The map itself contains religious connotations and symbolism, with the format being an expanded version of the T and O map, with Jerusalem at the center and the east at the top. Catalan Atlas Drawn by Cresques Abraham, a Jewish cartographer and leading member of the Majorcan cartographic school. This world map placed China at the center and mapped the Cape of Good Hope before

the Europeans would visit it. Earlier versions of the world map were made in the s but the surviving copy is the elaborate one made for the first Ming emperor. It uses Chinese cartographic techniques combined with western knowledge from Islamic scholars in the Mongol Empire. It also has improved information of Japan, although the islands themselves are not positioned or scaled correctly. According to some scholars, the map is superior to any found in Europe before the end of the s, due to its accuracy and the land it encompasses. De Virga world map Abertinus de Virga, a Venetian cartographer, made this map and a Mediterranean map. This world map contains the circular geographic representation, a calendar, and two tables. It is surprisingly detailed, and shows the coast of California although it mistakes California to be an island and not a contiguous part of the new world. However, the fact that the map is not centered on China, and that it resembles a French 17th century world map in some of its other errors, have convinced some experts that the map is a fake. The map does match up very exactly with the accounts of his voyages that Zheng He wrote; however, a falsified map would make an effort to do the same. The atlas contained extensive navigation charts, other diagrams, and the circular world map. The map is potentially the first to portray Florida correctly, as there is a peninsula attached to an island labeled Antillia. The author is unknown. Interestingly enough, the map shows a three-masted ship a European invention in the Indian Ocean, an event that had not yet occurred. The ship in question: Made by Fra Mauro, a venetian monk, and his assistant Andrea Bianco who had previously made a world map in Martellus world map Heavily influenced by Ptolemy despite later, more accurate maps and accounts that existed at this time this map was similar to the terrestrial globe by Martin Behaim in It is rife with inaccuracies, leaving out the Americas entirely and enlarging the Asian islands and Japan. Chinese world map Centering circularly on China, with provincial names and markers written in Chinese. China is shown as the Middle Kingdom, and other continents and countries surround its edges with only simple illustrations and a name to denote them. His map is the first known European map including the Americas. Cantino planisphere This is the earliest surviving map that includes Portuguese discoveries of the Americas and in the east. It includes the east coast of North America with more detail than would be expected. It was also publicly published and distributed. The map contains information from Spanish, Portuguese, along with the misconceptions accompanying those accounts for example, connecting Cuba and Newfoundland to Asia. However, it is generally a good amalgam of all known accounts of the time of unexplored or little explored areas. The map is rich in detail and as much accuracy as was generally available at the time. Piri Reis map Made by Ottoman admiral and cartographer Piri Reis, only a third of the map survives but shows the costs of Europe and North America with a degree of accuracy, as well as the coast of Brazil. The map extends the American continent south-eastward from what was definitively known at the time, which some have claimed suggests at least some awareness of Antarctica, though this is controversial. Others suggest that the extension depicts South America all the way to Cape Horn, which was secretly explored by Portuguese navigators before The land mass could have been bent south-east to fit the size of parchment Piri Reis was working with. Diogo Ribeiro Map First world map that used latitude observations to map locations more accurately. The map fails to include Australia or Antarctica, and the Indian subcontinent is too small; however, the coasts of central and south america are precise and accurate, and it shows the Pacific Ocean properly extended. It is considered the first scientific world map. Pierre Desceliers world map Summarizes discoveries and cartographic innovations of past 75 years. Mercator world map Gerardus Mercator introduced this cylindrical map projection which would become the world standard known as the Mercator projection. The projection distorts the size and shape of large objects while keeping smaller ones preserved, as well as preserving angles. The map was created to be used for marine navigation. The Sinusoidal projection is pseudo-cylindrical and is an equal-area projection, meaning the projection shows sizes correctly but angles and orientations can be distorted. Theatrum Orbis Terrarum Made by Abraham Ortelius and printed in Antwerp, this was the first modern atlas to be produced. It is sometimes considered a summary of 16th century cartography, containing a source list and a series of maps that were based on sources that are rare or no longer existent. Vaz Dourado Atlas Depicts China, Japan, and the Korean peninsula without much accuracy, but includes illustrations of traditionally "asian" architecutre

pagodas. The geography of China is less confused than Japan and Korea; however, the placement of the major rivers is incorrect. He also writes accurately about Central America, the Middle East, and other areas of the world. It was the first map to show Australia that was made publicly available. Transverse Mercator projection Different aspect of the Mercator construction, focusing on the poles and not the equator in its accuracy. Cahill Butterfly World Map Invented by Bernard Joseph Stanislaus Cahill, the map allows all continents to be uninterrupted while remaining true to shape, size, and form. The butterfly projection can ideally be wrapped into a ball or flattened from a ball. Goode homolosine projection Developed as an alternative to the Mercator projection, the projection has equal-area properties and similar distortions to the Mercator projection, although the representation of distances between continents is somewhat clearer. Sometimes called the orange-peel projection. Dymaxion map Created by Buckminster Fuller, this map projection treats the earth as an icosahedron, and preserves continental shape and size while disrupting the contiguity of the globe. Depending on the focus of the projection, the map can show the land masses as nearly contiguous or can focus on the expanse of ocean of the pacific and atlantic. Waterman Butterfly World Map Like the Cahill butterfly map, this projection can be folded into a sphere and is linked in one of the oceans, typically the north Pacific or north Atlantic. They were militarily advanced, using chariots and developing weapons that were precursors to developments of the Iron Age. They wrote in cuneiform and based on archaeological records had correspondence with Egypt and the Middle East. The empire fell with the fall of the Bronze Age and split into various "Neo-Hittite" states that survived for centuries afterwards, some lasting until BCE. Archaelogical and historical evidence from this time shows the Chinese already had written language. This was during the early Bronze age. Most knowledge of the Roman Kingdom comes from legends and writing of this period. The hierarchical society made technological and cultural innovations, and Greek Hellenism was a particularly popular cultural influence. This was also a period of great expansion around the mediterranean as the Roman Republic came to include the entire Italian peninsula, the Iberian peninsula, North Africa, Greece, and the eastern Mediterranean. Begins with the death of Alexander the Great and ends with the Roman conquest of Greece.

Chapter 6 : Anaximander Explained

She traces a shift in authorial perspective, from a godlike overview to the more focused outlook of human beings caught up in a developing plot, inspired by advances in cartography, travel, and geometry.

Valcamonica rock art I , Paspardo r. As early as the 8th century, Arab scholars were translating the works of the Greek geographers into Arabic. Early forms of cartography of India included depictions of the pole star and surrounding constellations. About 1, of these are known to have survived: By combining the knowledge of Africa , the Indian Ocean , Europe , and the Far East which he learned through contemporary accounts from Arab merchants and explorers with the information he inherited from the classical geographers, he was able to write detailed descriptions of a multitude of countries. Along with the substantial text he had written, he created a world map influenced mostly by the Ptolemaic conception of the world, but with significant influence from multiple Arab geographers. It remained the most accurate world map for the next three centuries. As part of this work, a smaller, circular map was made depicting the south on top and Arabia in the center. The invention of the magnetic compass , telescope and sextant enabled increasing accuracy. In , Martin Behaim , a German cartographer, made the oldest extant globe of the Earth. Portuguese cartographer Diego Ribero was the author of the first known planisphere with a graduated Equator Italian cartographer Battista Agnese produced at least 71 manuscript atlases of sea charts. Johannes Werner refined and promoted the Werner projection. This was an equal-area, heart-shaped world map projection generally called a cordiform projection which was used in the 16th and 17th centuries. Over time, other iterations of this map type arose; most notable are the sinusoidal projection and the Bonne projection. The Werner projection places its standard parallel at the North Pole; a sinusoidal projection places its standard parallel at the equator; and the Bonne projection is intermediate between the two. By this construction, courses of constant bearing are conveniently represented as straight lines for navigation. The same property limits its value as a general-purpose world map because regions are shown as increasingly larger than they actually are the further from the equator they are. Mercator is also credited as the first to use the word "atlas" to describe a collection of maps. He was unable to complete it to his satisfaction before he died. Still, some additions were made to the Atlas after his death and new editions were published after his death. For example, one of the most famous early maps of North America is unofficially known as the "Beaver Map", published in by Herman Moll. This map is an exact reproduction of a work by Nicolas de Fer. By the 18th century, map-makers started to give credit to the original engraver by printing the phrase "After [the original cartographer]" on the work. It belongs to the so-called plane chart model, where observed latitudes and magnetic directions are plotted directly into the plane, with a constant scale, as if the Earth were a plane Portuguese National Archives of Torre do Tombo, Lisbon. Mapping can be done with GPS and laser rangefinder directly in the field. Image shows mapping of forest structure position of trees, dead wood and canopy. In cartography, technology has continually changed in order to meet the demands of new generations of mapmakers and map users. The first maps were produced manually, with brushes and parchment; so they varied in quality and were limited in distribution. The advent of magnetic devices, such as the compass and much later, magnetic storage devices, allowed for the creation of far more accurate maps and the ability to store and manipulate them digitally. Advances in mechanical devices such as the printing press , quadrant and vernier , allowed the mass production of maps and the creation of accurate reproductions from more accurate data. Hartmann Schedel was one of the first cartographers to use the printing press to make maps more widely available. Advances in photochemical technology, such as the lithographic and photochemical processes , make possible maps with fine details, which do not distort in shape and which resist moisture and wear. This also eliminated the need for engraving, which further speeded up map production. In the 20th century, aerial photography , satellite imagery , and remote sensing provided efficient, precise methods for mapping physical features, such as coastlines, roads, buildings, watersheds, and topography. The United States Geological Survey has devised multiple new map

projections, notably the Space Oblique Mercator for interpreting satellite ground tracks for mapping the surface. The use of satellites and space telescopes now allows researchers to map other planets and moons in outer space. The ability to superimpose spatially located variables onto existing maps created new uses for maps and new industries to explore and exploit these potentials. See also digital raster graphic. These days most commercial-quality maps are made using software of three main types: Spatial information can be stored in a database , from which it can be extracted on demand. These tools lead to increasingly dynamic, interactive maps that can be manipulated digitally. Field-rugged computers , GPS , and laser rangefinders make it possible to create maps directly from measurements made on site. Deconstruction[edit] There are technical and cultural aspects to producing maps. In this sense, maps can sometimes be said to be biased. A central tenet of deconstructionism is that maps have power. Other assertions are that maps are inherently biased and that we search for metaphor and rhetoric in maps. Popular belief at the time was that this scientific approach to cartography was immune to the social atmosphere. In this belief European maps must be superior to others, which necessarily employed different map-making skills. However, to later scholars in the field, it was evident that cultural influences dominate map-making. The depiction of Africa and the low latitudes in general on the Mercator projection has been interpreted as imperialistic and as symbolic of subjugation due to the diminished proportions of those regions compared to higher latitudes where the European powers were concentrated. Through this, maps made European commerce in Africa possible by showing potential commercial routes, and made natural resource extraction possible by depicting locations of resources. Such maps also enabled military conquests and made them more efficient, and imperial nations further used them to put their conquests on display. These same maps were then used to cement territorial claims, such as at the Berlin Conference of â€” In , Jean B. Relief map Sierra Nevada In understanding basic maps, the field of cartography can be divided into two general categories: General cartography involves those maps that are constructed for a general audience and thus contain a variety of features. General maps exhibit many reference and location systems and often are produced in a series. For example, the 1: The government of the UK produces the classic 1: Many private mapping companies have also produced thematic map series. Thematic cartography involves maps of specific geographic themes, oriented toward specific audiences. A couple of examples might be a dot map showing corn production in Indiana or a shaded area map of Ohio counties, divided into numerical choropleth classes. As the volume of geographic data has exploded over the last century, thematic cartography has become increasingly useful and necessary to interpret spatial, cultural and social data. A third type of map is known as an "orienteering," or special purpose map. This type of map falls somewhere between thematic and general maps. They combine general map elements with thematic attributes in order to design a map with a specific audience in mind. Oftentimes, the type of audience an orienteering map is made for is in a particular industry or occupation. An example of this kind of map would be a municipal utility map. Terrain or relief can be shown in a variety of ways see Cartographic relief depiction. In the present era, one of the most widespread and advanced methods used to form topographic maps is to use computer software to generate digital elevation models which show shaded relief. Before such software existed, cartographers had to draw shaded relief by hand. One cartographer who is respected as a master of hand-drawn shaded relief is the Swiss professor Eduard Imhof whose efforts in hill shading were so influential that his method became used around the world despite it being so labor-intensive. It often disregards scale and detail in the interest of clarity of communicating specific route or relational information. Although the most widely used map of "The Tube," it preserves little of reality: The only topography on it is the River Thames , letting the reader know whether a station is north or south of the river. That and the topology of station order and interchanges between train lines are all that is left of the geographic space. Map purpose and selection of information[edit] Arthur H. Robinson , an American cartographer influential in thematic cartography, stated that a map not properly designed "will be a cartographic failure. From the very beginning of mapmaking, maps "have been made for some particular purpose or set of purposes". The term percipient refers to the person receiving information and was coined by Robinson. If the user is unable to identify what is being demonstrated in a reasonable fashion,

the map may be regarded as useless. Making a meaningful map is the ultimate goal. Alan MacEachren explains that a well designed map "is convincing because it implies authenticity" , pp. An interesting map will no doubt engage a reader. Information richness or a map that is multivariate shows relationships within the map. Showing several variables allows comparison, which adds to the meaningfulness of the map. This also generates hypothesis and stimulates ideas and perhaps further research. In order to convey the message of the map, the creator must design it in a manner which will aid the reader in the overall understanding of its purpose. The title of a map may provide the "needed link" necessary for communicating that message, but the overall design of the map fosters the manner in which the reader interprets it Monmonier, , pp. In the 21st century it is possible to find a map of virtually anything from the inner workings of the human body to the virtual worlds of cyberspace. Therefore, there are now a huge variety of different styles and types of map â€” for example, one area which has evolved a specific and recognisable variation are those used by public transport organisations to guide passengers , namely urban rail and metro maps , many of which are loosely based on 45 degree angles as originally perfected by Harry Beck and George Dow. Toponymy and Cartographic labeling Most maps use text to label places and for such things as the map title, legend and other information. Although maps are often made in one specific language, place names often differ between languages. So a map made in English may use the name Germany for that country, while a German map would use Deutschland and a French map Allemagne. A non-native term for a place is referred to as an exonym. In some cases the correct name is not clear. For example, the nation of Burma officially changed its name to Myanmar , but many nations do not recognize the ruling junta and continue to use Burma. Sometimes an official name change is resisted in other languages and the older name may remain in common use.

Chapter 7 : Anaximander - WikiVisually

The world in the hand: Anaximander, Pherecydes, and the invention of cartography; 4. Map and narrative: Herodotus' Histories; 5. Losing the way home: Xenophon's Anabasis; 6.

All pre-socratic philosophy, in particular: 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, arguably, Pythagoras amongst his pupils. According to available historical documents, he is the first philosopher known to have written down his studies, [3] although only one fragment of his work remains. Fragmentary testimonies found in documents after his death provide a portrait of the man. 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. In astronomy , he attempted 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. Themistius , a 4th-century Byzantine rhetoric ian, mentions that he was the "first of the known Greeks to publish a written document on nature. 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. 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. Indeed, Various History III, 17 explains that philosophers sometimes also dealt with political matters. Anaximander lived the final few years of his life as a subject of the Persian Achaemenid Empire. 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. 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. 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. The decisions are now taken by the assembly of demos in the agora which is lying in the middle of the city. Origin, then, must be something else unlimited in its source, that could create without experiencing decay, so that genesis would never stop. 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. 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. This arche is called "eternal and ageless". 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. 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. 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. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements: 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, [23] and by the Greek tragedian Euripides: It confirms that pre-Socratic philosophers were making an early effort to demystify physical processes. His major contribution to history was writing the oldest prose document about the Universe and the origins of life ; for this he is often called the "Father of Cosmology " and founder of astronomy. However, pseudo-Plutarch states that he still viewed celestial bodies as deities. 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. The flat top forms the inhabited world, which is surrounded by a circular oceanic mass. 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 [33] and the lunar wheel, whose fire was less intense, eighteen or nineteen times. Its hole could change shape, thus explaining lunar phase s. The star s and the planet s, located closer, [34] followed the same model. 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". Cicero writes that he attributes different gods to the countless worlds. 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. 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. 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. The 3rd century Roman writer Censorinus reports: 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. Only some small examples survived until today. The unique example of a

world map comes from late Babylonian tablet BM later than 9th century BC but is based probably on a much older map. These maps indicated directions, roads, towns, borders, and geological features. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. 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. 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 Africa n 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 sundial s to indicate solstice s and equinox es. 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 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 Babylonia ns. 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, , 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. 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. Anaximander seems to express his belief that a natural order ensures balance between these elements, that where there was fire, ashes earth now exist. 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 " The lecture examines the ontological difference and the oblivion of Being or Dasein in the context of the Anaximander fragment.

Chapter 8 : Cartography - Ancient Greece Civilization

The World in the Hand: Anaximander, Pherecydes, and the Invention of Cartography 4. Map and Narrative: Herodotus's Histories 5. Losing the Way Home: Xenophon's Anabasis 6.

References and Further Reading 1. He was the first who dared to write a treatise in prose, which has been called traditionally On Nature. This book has been lost, although it probably was available in the library of the Lyceum at the times of Aristotle and his successor Theophrastus. It is said that Apollodorus, in the second century BCE, stumbled upon a copy of it, perhaps in the famous library of Alexandria. Only one fragment of the book has come down to us, quoted by Simplicius after Theophrastus , in the sixth century AD. It is perhaps the most famous and most discussed phrase in the history of philosophy. He is said to have led a mission that founded a colony called Apollonia on the coast of the Black Sea. He also probably introduced the gnomon a perpendicular sun-dial into Greece and erected one in Sparta. So he seems to have been a much-traveled man, which is not astonishing, as the Milesians were known to be audacious sailors. It is also reported that he displayed solemn manners and wore pompous garments. Most of the information on Anaximander comes from Aristotle and his pupil Theophrastus , whose book on the history of philosophy was used, excerpted, and quoted by many other authors, the so-called doxographers, before it was lost. Sometimes, in these texts words or expressions appear that can with some certainty be ascribed to Anaximander himself. Relatively many testimonies, approximately one third of them, have to do with astronomical and cosmological questions. A quotation like "DK 12A17" means: Anaximander is said to have identified it with "the Boundless" or "the Unlimited" Greek: Already in ancient times, it is complained that Anaximander did not explain what he meant by "the Boundless. Some scholars have even defended the meaning "that which is not experienced," by relating the Greek word "apeiron" not to "peras" "boundary," "limit" , but to "perao" "to experience," "to apperceive". The suggestion, however, is almost irresistible that Greek philosophy, by making the Boundless into the principle of all things, has started on a high level of abstraction. On the other hand, some have pointed out that this use of "apeiron" is atypical for Greek thought, which was occupied with limit, symmetry and harmony. The Pythagoreans placed the boundless the "apeiron" on the list of negative things, and for Aristotle , too, perfection became aligned with limit Greek: The Arguments Regarding the Boundless It seems that Anaximander not only put forward the thesis that the Boundless is the principle, but also tried to argue for it. We might say that he was the first who made use of philosophical arguments. Therefore, any reconstruction of the arguments used by the Milesian must remain conjectural. Verbatim reconstruction is of course impossible. Nevertheless, the data, provided they are handled with care, allow us to catch glimpses of what the arguments of Anaximander must have looked like. The important thing is, however, that he did not just utter apodictic statements, but also tried to give arguments. This is what makes him the first philosopher. The Boundless has No Origin Aristotle reports a curious argument, which probably goes back to Anaximander, in which it is argued that the Boundless has no origin, because it is itself the origin. We would say that it looks more like a string of associations and word-plays than like a formal argument. It runs as follows: The Boundless has no origin. For then it would have a limit. Moreover, it is both unborn and immortal, being a kind of origin. For that which has become has also, necessarily, an end, and there is a termination to every process of destruction" Physics b, DK 12A The Greeks were familiar with the idea of the immortal Homeric gods. Anaximander added two distinctive features to the concept of divinity: However, perhaps not Anaximander, but Thales should be credited with this new idea. That which has no origin and no end" DK 11A1 The Origin Must be Boundless Several sources give another argument which is somehow the other way round and answers the question of why the origin should be boundless. In this argument, the Boundless seems to be associated with an inexhaustible source. Obviously, it is taken for granted that "genesis and decay will never stop," and the Boundless has to guarantee the ongoing of the process, like an ever-floating fountain. The "Long Since" Argument A third argument is relatively long and somewhat strange. It turns on one key word in Greek: If any

of them should be boundless, it would long since have destroyed the others; but now there is, they say, something other from which they are all generated" Physics b, DK 12A This is not only virtually the same argument as used by Plato in his Phaedo 72ab5 , but even more interesting is that it was used almost years later by Friedrich Nietzsche in his attempts to prove his thesis of the Eternal Recurrence: If there were for it some unintended final state, this also must have been reached. If it were at all capable of a pausing and becoming fixed, if it were capable of "being," if in the whole course of its becoming it possessed even for a moment this capability of "being," then again all becoming would long since have come to an end. The ancient Greeks did not use quotation marks, so that we cannot be sure where Simplicius, who has handed down the text to us, is still paraphrasing Anaximander and where he begins to quote him. The text is cast in indirect speech, even the part which most authors agree is a real quotation. The Greek original has relative pronouns in the plural here rendered by "whence" and "thence" , which makes it difficult to relate them to the Boundless. Therefore, we offer a translation, in which some poetic features of the original, such as chiasmus and alliteration have been imitated: Whence things have their origin, Thence also their destruction happens, As is the order of things; For they execute the sentence upon one another - The condemnation for the crime - In conformity with the ordinance of Time. In the fourth and fifth line a more fluent translation is given for what is usually rendered rather cryptic by something like "giving justice and reparation to one another for their injustice. The upholders of the horizontal interpretation usually do not deny that Anaximander taught that all things are generated from the Boundless, but they simply hold that this is not what is said in the fragment. They argue that the fragment describes the battle between the elements or of things in general , which accounts for the origin and destruction of things. The most obvious difficulty, however, for this "horizontal" interpretation is that it implies two cycles of becoming and decay: In other words, in the "horizontal" interpretation the Boundless is superfluous. This is the strongest argument in favor of the "vertical" interpretation, which holds that the fragment refers to the Boundless, notwithstanding the plural relative pronouns. There is some sense in this suggestion. On the other hand, we must recognize that we know hardly anything of its original context, as the rest of the book has been lost. The danger exists that we are tempted to use this stray text - beautiful and mysterious as it is - in order to produce all kinds of profound interpretations that are hard to verify. Its eternal movement is said to have caused the origin of the heavens. Elsewhere, it is said that "all the heavens and the worlds within them" have sprung from "some boundless nature. Subsequently, the sphere of fire is said to have fallen apart into several rings, and this event was the origin of sun, moon, and stars. There are authors who have, quite anachronistically, seen here a kind of foreshadowing of the Kant-Laplace theory of the origin of the solar system. But this is presumably a later theory, incorrectly read back into Anaximander. Some authors even think that they are so confused that we should give up trying to offer a satisfying and coherent interpretation. It will appear that many of the features of his universe that look strange at first sight make perfect sense on closer inspection. Speculative Astronomy The astronomy of neighboring peoples, such as the Babylonians and the Egyptians, consists mainly of observations of the rising and disappearance of celestial bodies and of their paths across the celestial vault. These observations were made with the naked eye and with the help of some simple instruments as the gnomon. The Babylonians, in particular, were rather advanced observers. Archeologists have found an abundance of cuneiform texts on astronomical observations. In contrast, there exists only one report of an observation made by Anaximander, which concerns the date on which the Pleiades set in the morning. We may discern three of his astronomical speculations: That the celestial bodies make full circles is not something he could have observed, but a conclusion he must have drawn. We would say that this is a conclusion that lies to hand. We can see - at the northern hemisphere, like Anaximander - the stars around the Polar star making full circles, and we can also observe that the more southerly stars sometimes disappear behind the horizon. We may argue that the stars of which we see only arcs in reality also describe full circles, just like those near the Polar star. As regards the sun and moon, we can observe that the arcs they describe are sometimes bigger and sometimes smaller, and we are able to predict exactly where they will rise the next day. Therefore, it seems not too bold a conjecture

to say that these celestial bodies also describe full circles. Nevertheless, it was a daring conclusion, precisely because it necessarily entailed the concept of the earth hanging free and unsupported in space. The Earth Floats Unsupported in Space Anaximander boldly asserts that the earth floats free in the center of the universe, unsupported by water, pillars, or whatever. This idea means a complete revolution in our understanding of the universe. Obviously, the earth hanging free in space is not something Anaximander could have observed. Apparently, he drew this bold conclusion from his assumption that the celestial bodies make full circles. The shape of the earth, according to Anaximander, is cylindrical, like a column-drum, its diameter being three times its height. We live on top of it. Some scholars have wondered why Anaximander chose this strange shape. The strangeness disappears, however, when we realize that Anaximander thought that the earth was flat and circular, as suggested by the horizon. For one who thinks, as Anaximander did, that the earth floats unsupported in the center of the universe, the cylinder-shape lies at hand. Why the Earth Does Not Fall We may assume that Anaximander somehow had to defend his bold theory of the free-floating, unsupported earth against the obvious question of why the earth does not fall. For that which is situated in the center and at equal distances from the extremes, has no inclination whatsoever to move up rather than down or sideways; and since it is impossible to move in opposite directions at the same time, it necessarily stays where it is. Even more interesting is that the same argument, within a different context, returns with the great protagonist of the principle of sufficient reason, Leibniz. In his second letter to Clarke, he uses an example, which he ascribes to Archimedes but which reminds us strongly of Anaximander: He takes it for granted that if there be a balance in which everything is alike on both sides, and if equal weights are hung on the two ends of that balance, the whole will stay at rest. This is because there is no reason why one side should weigh down, rather than the other". One may doubt, however, whether the argument is not fallacious. Aristotle already thought the argument to be deceiving. He ridicules it by saying that according to the same kind of argument a hair, which was subject to an even pulling power from opposing sides, would not break, and that a man, being just as hungry as thirsty, placed in between food and drink, must necessarily remain where he is and starve.

Chapter 9 : Anaximander - Wikipedia

Anaximander: Anaximander, Greek philosopher who was the first to develop a cosmology, or systematic philosophical view of the world. Only a short fragment of Anaximander's work survives, so reconstructions of his philosophy and astronomy must be based on summaries by later Greek writers, such as the 1st- or.

He belonged to the Milesian school and learned the teachings of his master Thales. He succeeded him 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. 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, his 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, he postulated that the indefinite or apeiron was the source of all things. 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 as he was sent as a leader to one of its colonies. With his assertion that physical forces, rather than supernatural means, create order in the universe, Anaximander can be considered the first true scientist. He is known to have conducted the earliest recorded scientific experiment. According to Apollodorus, Greek grammarian of the 2nd century BC, he was sixty-four years old during the second year of the 58th Olympiad BC , and died shortly afterwards. Establishing a timeline of his work is now impossible, since no document provides chronological references. Themistius, a 4th century Byzantine rhethorician , mentions that he was the "first of the known Greeks to publish a written document on nature" and 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. 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. Indeed, Various History III, 17 explains that philosophers sometimes left the contentment of their thoughts to deal with political matters. For him, it became no longer a mere point in time, but a source that could perpetually give birth to whatever will be. 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. 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. 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. Anaximander argues that water cannot embrace all of the opposites found in nature â€” for example, water can only be wet, never dry â€” 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. 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. Simplicius transmitted it as a quotation, which describes the balanced and mutual changes of the elements: 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. This concept of returning to the element of origin was often revisited afterwards, notably by Aristotle, and by the Greek tragedian Euripides: It confirms that pre-Socratic philosophers were making an early effort to demythify physical processes. His major contribution to history was writing the oldest prose document about the Universe and the origins of life; for this he is often called the "Father of Cosmology" and founder of astronomy. However, pseudo-Plutarch states that he still viewed celestial bodies as deities. 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. 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". Cicero writes that he attributes different gods to the countless worlds. 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. 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. He saw the sea as a remnant of the mass of humidity that once surrounded Earth. He explained rain as a product of the humidity pumped up from Earth by the sun. For him, the Earth was slowly drying up and water only remained in the deepest regions, which someday would go dry as well. 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. As the early humidity evaporated, dry land emerged and, in time, humankind had to adapt. The 3rd century Roman writer Censorinus reports: 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": 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. Only some small examples survived until today. The unique example of a world map comes from late Babylonian tablet BM later than 9th century BCE but is based probably on a much older map. These maps indicated directions, roads, towns, borders, and geological features. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. 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. 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. 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.