# პუბლიკაცია
# PUBLICATIONS

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## *Cosmography, Topography, Geography: From Antiquity to 6th Century Byzantium*

This paper is part of the cycle of lectures held in June 2018 at Ilia State University (Tbilisi), in the framework of an Erasmus+ exchange between Tbilisi and the *Institut orientaliste* of the Université catholique de Louvain (UCLouvain, Louvain-la-Neuve, Belgium).[1] The lectures aimed to retrace the main steps in the evolution of notions and "sciences" such as cosmography, topography, geography and the likes in the Greek world, from Antiquity up to the first centuries of the Byzantine Empire. The presentation certainly makes no claims to exhaustivity, but the author hopes to show that, despite radical changes provoked by the irruption of Christianity into Greco-Roman thought, it is possible to find, in 6th century Byzantium, an echo of old questions, long discussed in Hellenic thought. The result is necessarily partial and selective, but the evolutive path will clearly appear.

### I. The Universe in Ancient Thought[2]

The concept of "Creation (of the world)" does not exactly cover that of "origins of the Universe", but they both arise from the same questions: where do we come from? How was the world around us, we live in, created? These questions have disturbed humanity at least as much as that of knowing what is going to happen to us after death. Disciplines such as geography, cosmography,

1 I express here my grateful thanks to Prof. Nino Doborjginidze and her colleagues at Ilia State University for welcoming me with such enthusiasm and for inviting me to publish part of this cycle in the University periodical.

2 For more complete information about the present section (except for I.A.), see for instance D.C. Lindberg, *The Beginnings of Western Science. The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 BC to AD 1450*, Chicago – London, 1992 (2d ed. 2007), mainly chapter 2.

etc. have developed in part to answer it, and in any case with a view to better understanding the world.[3]

In this regard, our Western civilization has long depended upon two very distinct antecedents: first, Greco-Roman civilization and, secondly, the Biblical tradition. I propose briefly examining here the answers they both proposed to these questions, before discussing Early Byzantium's position.

## I. A. Some Definitions

Delineating the scope of some of the sciences related to our subject is worthwile.[4] In the definitions that follow, I highlight elements that are significant for our topic:

**– Geography**

Origin**:** γεω– (γῆ = *Earth*) + γράφω (*to write, to draw*) => γεωγραφία = *description of the Earth*.

1. A treatise on the physical features or characteristics of a region; a textbook on geography.

2. **a.** The field of study concerned with the physical features of the earth and its atmosphere, and with human activity as it affects and is affected by these, including the distribution of populations and resources, and political and economic activities; also as a subject of educational study or examination.

**b.** The geographical features or topography of a place or region; a place or region, or terrain, as characterized by such features. Also: the range or extent of what is known geographically.

**c.** A subject treated or regarded in its geographical aspects; the geographical distribution of something.

3**.** *Astron.* The topographical features of a celestial object, esp. the moon or a rocky planet; a book about these; a field of study concerned with these.

**– Geodesy**

Origin: gr. γεωδαισία = γεω– (γῆ = *Earth*) + rad. of δαίζω (= *to divide, to partake*) => literally, *division of the Earth*.

It is primarily concerned with positioning within the temporally varying gravity field. Geodesy is concerned with measuring the Earth on the global

3 The lectures held in Tbilisi initiated in the framework of a Master's course on Byzantine Culture and Civilization given at Louvain University (Louvain-la-Neuve, Belgium) in 2018, and of a lecture given in the same University within the course of Transversal Theological Questions, whose theme focused on the Creation (March 2018).

4 The definitions given here follow the main English dictionaries, such as *The Oxford English Dictionary* and the *English Collins Dictionary*, both accessible online.

scale, and with measuring specific parts or regions of the Earth, which includes surveying. Such geodetic operations also apply to other astronomical bodies in the solar system.

It is also the science of measuring and understanding the Earth's geometric shape, orientation in space, and gravity field.

**– Topography**

Origin: gr. τοπογραφία = τόπος (*place*) + γράφω (*to write, to draw*) => *description of an area*.

**1.** Study and description of the physical features of an area, for example its hills, valleys, or rivers, or the representation of these features on maps.

**2.** The **topography** of a particular area is its physical shape, including its hills, valleys and rivers.

**– Cosmography**

Origin: gr. κοσμογραφία = κόσμος (*world, universe*) + γράφω (*to write, to draw*) => *description of the universe.*

Cosmography is the science that maps the general features of the cosmos or universe, describing both heaven and Earth (but without encroaching on geography or astronomy).

**1**. A general description of the world or of the universe

**2**. The science that deals with the constitution of the whole order of nature.

**– Cartography**

Origin: gr. χάρτης (*papyrus, sheet of paper, map*) + γράφω (*to write, to draw*) => *study and practice of making maps*.

Combining science, aesthetics, and technique, cartography builds on the premise that reality can be modeled in ways that communicate spatial information effectively.

**– Ethnography**

Origin: gr. ἔθνος (*a company*; later: *a people, nation*) + γράφω (*to write, to draw*) => *writing about (foreign) peoples*.

Ethnographic studies focus on large cultural groups of people who interact over time. Ethnography is a set of qualitative methods used in social sciences, focusing on the observation of social practices and interactions. Its aim is to observe a situation without imposing any deductive structure or framework upon it and to view everything as strange or unique.

When using one of these terms in the context of Antiquity and Byzantium, one must keep in mind that they consistently overlap a bit.

## I. B. Origin, Form and Content of the World

Questions about the origin, form and content of the world are perceptible in Greek literature from the very beginning: first, through the mythological thought; then, involving the oldest known scientists / "philosophers" (from the 7th century BC on).[5]

1. The mythological representations are a first aspect. Stories about divinities such as Chaos, Cronos, Gaia, the Titans, Zeus, the twelve Olympian gods, etc., do not move us much today. After all, the answers of today's science sometimes only make us dizzy, and their full implications are remotely far from accessible to non-specialists.

This type of response emerged long before the first testimonies that have come down to us, including Hesiod's *Works and Days* and his *Theogony* (8th/7th century BC). The latter are an emblematic example of this kind of thought, one also found in the Homeric texts. Briefly speaking, they consider nature as formed of different kinds of gods; they being anthropomorphic personifications of various elements such as animals, plants, meteorological phenomena, and water sources, etc.

2. Sages or "philosophers" then took over. After this mythological and anthropomorphic thought, we find what may be called more "rational" explanations, that is, without the gods' intervention. The end of the archaic times and the beginning of the classical period saw the attempts of "wise", "learned" men, or "philosophers" (litt. *lovers of wisdom*, hence *of knowledge*) to provide answers to these same questions. This time, however, the answers were based upon thinking, reasoning, hypotheses and deduction. The first theories focus on natural elements, considered as the principle (ἀρχή) of the existence of the world. The names of the most famous of them, Socrates' predecessors, are still well known.

– Thales of Miletus' name (Θαλῆς ὁ Μιλήσιος; 6th century BC) has remained attached to a famous theorem in geometry. He considered water as the fundamental substance at the origin of the world.

It is also interesting, for our purpose, to note the vision Thales had of this world: for him, the Earth floats on the water, with earthquakes occuring when the Earth is rocked by waves.[6]

5 We present a rather cursory view of the various theories, our main goal being to give an overview of the evolution in one precise field among them. For a more comprehensive treatment, see e.g. J.M. Robinson, *An Introduction to Early Greek Philosophy*, Boston, 1968; and for modern bibliography about each single character, the *Stanford Encyclopedia of Philosophy* (https://plato.stanford.edu/) is a good start.

6 As for most of the early philosophers, no writing by Thales has reached us; we know his doctrine via his successors.

– His contemporary Anaximander (Ἀναξίμανδρος) of Miletus considered that the fundamental substance or principle of all things was the abstract ἄπειρον (*indeterminate*), namely: that which is eternal, immutable, and divine. According to him, nature is ruled by laws, just like human societies, and anything disturbing the balance of nature does not last long.

Anaximander understood the first principle to be an endless, unlimited primordial mass (the *apeiron*), subject to neither old age nor decay, and from which everything we perceive derives.

According to him, the Universe originated in the separation of opposites in the primordial matter (hot and cold, wet and dry), and directed the movement of things. This in turn provided countless shapes and differences, in this world as well as the many others he believed to be existing. The balance presiding between the opposites is re-established every time it is destroyed.

At the origin of the world, after the separation of the opposites, a ball of flame appeared surrounding the Earth like a haze. That ball broke apart to form the rest of the Universe. It resembled concentric wheels (κύκλοι), filled with fire and surrounded by air; those air envelops were pierced with holes like a flute's; from Earth the fire of the Sun, the moon, the stars and planets could be seen through those holes.

In his cosmography, the Earth is like a column drum in the centre of our world, in a perfectly symmetrical position; thus, there is no need of movement [fig. 1].

– Anaximenes (Ἀναξιμένης) of Miletus, a little younger but also living in the 6$^{th}$ century BC, returns to a principle identified with a fundamental element: the air. Fundamentally, Anaximenes wanted to present something less abstract and more familiar than Anaximander's Indeterminate, though remaining the least determined possible: his air is therefore eternal, divine, and quantitatively infinite. Air's condensation and rarefaction gave birth to the realities of our world: when air condenses, it becomes visible as mist or rain; as the condensed air cooled, Anaximenes supposed that it formed earth and even stones; in contrast, water evaporates into the air, which ignites and produces flame when further rarefied.

In his cosmography the Earth floats on air like a leaf caught in the wind.

– Pythagoras of Samos (Πυθαγόρας ὁ Σάμιος)'s notoriety is due to the numerous disciples his School swarmed and to a well-known theorem.[7]

7 The Pythagorean theorem: in a right-angled triangle the square of the hypotenuse is equal

He was another thinker of the 6th century BC. According to Pythagorean conceptions, Number governs the Universe, that is, all things are made out of numbers. Number one (the monad) represents the origin of all things, and number two (the dyad) represents the matter; number three is considered an "ideal number" because it has a beginning, a middle, and an end; it is also the smallest number of points that could be used to define a plane triangle, which the members of the Pythagorean School revered as a symbol of the god Apollo; number four is related to the four seasons, the four elements, etc.

Cosmology became more complex with the Pythagoreans: the centre of the world is occupied by fire, around which are turning ten spherical celestial bodies (Earth, Anti-Earth, Moon, Sun, Mercury, Venus, Mars, Jupiter, Saturn, and finally the sky of the fixed stars). The Earth performs its daily revolution around the central fire while turning on its own axis, so presenting to it the side opposite the one we inhabit – which is why we never see it.

The ten celestial bodies, moving at full speed through space, produce different sounds because of their varying distance from the centre; these sounds correspond to the eight musical notes (with some arrangements: Earth and Anti-Earth produce the same note, with the highest sky producing no sound). Of course, the symphony produced that way is inaudible to human ears. This is the theory known as the "harmony of the spheres", which will later influence authors such as Plato and Cicero.[8]

– For Heraclitus of Ephesus (Ἡράκλειτος ὁ Ἐφέσιος; late 6th-early 5th century BC), the principle of life resides in the law of perpetual change of opposites into their opposite (living and dead; sleeping and waking; young and old), in both directions. This perpetual change does not contradict the fundamental unity of existence, which in spite of multiplicity remains fixed and immutable (to schematize: a river is never the same, since water flows and does not remain at the same place; but it also is always the same, because it always flows in the same bed). The fundamental element is therefore fire, which is *par excellence* the aspect of matter where perpetual motion is manifested; at the cosmic level, this fire is called *ether*: it is the pure and luminescent element filling the highest regions of the sky.

to the sum of the squares of the two other sides — that is, $a^2 + b^2 = c^2$.

8 Interestingly enough, an organization as serious as NASA shares its recordings of "spooky sounds from accross the solar system": see e.g. https://soundcloud.com/nasa/sets/spookyspacesounds/. Other links join these sounds to natural phenomena: see e.g. https://www.facebook.com/ScienceNaturePage/videos/1331446206987634/

– Empedocles (Ἐμπεδοκλῆς) of Agrigento (Akragas, Sicily; 5th century BC) considered that the world consists basically of four "roots" (ῥιζώματα):[9] fire, air, water, earth. These elements are in themselves eternal and immutable. The world around us is being formed by their distribution (by combination and dissociation), in definite proportions, which produces unstable aggregates, whose destiny is to be born and then to perish. These mixings (by successive aggregation and segregation) are done and undone under the action of two contrary forces, eternal and immutable as are the elements themselves: Love (φιλότης) and Strife (νεῖκος). Both forces wax and wane in their dominance, but neither of them ever wholly escapes the imposition of the other.

– For Anaxagoras (Ἀναξαγόρας) of Clazomenae (5th century BC), "everything is in everything", and our senses only discern the dominant element. E.g.: What we call "snow" also contains parts of many other things, but we call it "snow" because snow is the predominant "seed" (σπέρμα) therein.

In his cosmogony: the efficient cause explaining the origin of the world is Νοῦς (*Mind*, *Intelligence*). It is also matter, but much finer and more subtle than the "seeds" of things, and pure (no combination). This subtle agent, possessed of all knowledge and power, is especially seen ruling in all life forms. Its activity makes it possible to communicate a gyratory movement, transmitting itself step by step, and so allowing the particles to separate and to unite, in order to form what composes the world. In other words, this Cosmic Mind (Νοῦς) is just a mechanical cause, and its role is limited to providing the first impulse.

– I won't dwell on the atomists' theories: like Democritus (Δημόκριτος) of Abdera (5th-4th century BC), they spoke of tiny particles of matter, whose gathering under the effect of purely mechanical forces formed beings and objects, death being nothing but the dissolution of these assemblages.

All in all, therefore, these philosophers' reasoning and, it may be said, their creativity, proposed various solutions to the problems related to the origins and composition of the world.

### I. C. "Scientists" and Maps

Some of these sages were already, at their level, what we may call "scientists": they studied natural phenomena in trying to describe and explain them. Most of them practiced various disciplines such as geometry, astronomy, mathematics, etc.

9 Which are called "elements" (στοιχεῖα) since Plato.

From the late 5th and early 4th century BC on, the term "philosopher" (φιλόσοφος) came to be used more narrowly, in the sense we still give it today, namely people reasoning about the meaning of life and similar issues. But "scientific" studies also continued to develop, mainly emphasizing observation: brilliant advances were made in geometry, astronomy, mathematics, and so on from the Hellenistic period to Late Antiquity. What is particularly important to us here is how these researchers represented the world. Some of them left us maps, or at least told us how to draw one. Here again is a list with the most significative steps in the evolution.

– In the Homeric days ("Ὅμηρος"; 8th-7th century BC), the Earth was considered a flat, circular disc surrounded by an Ocean. Greeks at the time knew very little about our actual world: they knew the desert of Libya (South of Egypt), the Southwestern coast of Asia Minor, and mainland Greece. The shores of the Black Sea were only known by myths and legends.

Greeks believed that they lived in the centre of the Earth, and that the edges of the world were inhabited by savages, barbarians, monsters and strange animals, many of whom figure in Homeric texts.

– Hesiod (Ἡσίοδος) shows little more extensive knowledge: he provides the first information on the coasts of Gaul, Sicily, etc. The first known Greek maps, namely those of Anaximander and Hecataeus of Miletus, were drawned according to these informations.

– Anaximander of Miletus (6th century BC), a disciple of Thales, would be the first to propose a map of the world. He thought the Earth was cylindrical in shape, like a stone pillar suspended in space. According to him, the inhabited part of this world (οἰκουμένη) was circular, disc-shaped, and occupied the upper surface of the cylinder. Unfortunately, no copy of this map has survived, and we can only get an idea of it from his successors, starting with Hecataeus of Miletus [fig. 1-2].

– Hecataeus of Miletus (Ἑκαταῖος ὁ Μιλήσιος; ca 550-475 BC) produced a map half a century later (ca 500 BC), which he claimed was an improved version of Anaximander's. On this map, the Earth is a circular plateau, encircled by an Ocean, with Greece at its centre. That vision, widespread at the time, matches Homeric conceptions.

Like many antique maps, there is no scale of representation; the units of measurement used were "days of navigation" at sea, and "walking days" on land. This map was designed to accompany his work, entitled "Journey round the Earth" (Περίοδος Γῆς or Περιήγησις). It was divided into two

books, one dealing with Europe, and the other with Asia (the latter also including Libya, a term used for the part of Africa known at the time). The world was thus limited to two continents, "Asia" and Europe; the border separating them is a line running through the Columns of Hercules to the Bosphorus, and pursued by the River Don. His vision of the Nile suggests that it comes from the Peripheral Ocean [fig. 3].

– Anaximenes of Miletus (6th century BC), a disciple of Anaximander, did not adhere to his master's vision of the Earth's shape. Instead, he proposed a rectangular Earth, supported by compressed air, a vision his successors failed to adopt [fig. 4].

– With the Pythaorean School, the idea of a spherical Earth, with a central fire at heart, is emerging (see *supra*, section I.B.).

– The time of Herodotus (Ἡρόδοτος; mid-5th century BC) saw new progress. Herodotus travelled widely to gather documentation and information for his work, aimed at relating Greece's wars with Persia. He gave the historiographical genre its name (ἱστορία = *investigation*).

Herodotus rejected the idea of a flat, circular Earth surrounded by an Ocean; instead, he described an irregularly shaped Earth, where only Asia and Africa were surrounded by the Ocean; he divided the world into three continents (Europe, Asia and Africa), delimiting Europe by a line running from the Columns of Hercules to the Bosphorus, and integrating the territory between the Caspian Sea and the Indus River; he saw the Nile as the border between Asia and Africa; etc. [fig. 5].

On the other hand, like his predecessors, Herodotus put the civilized Greeks at the centre of the Earth, and barbarians at the edges of the world; according to him, the farther one goes from Greece, the stranger the world becomes, and the wilder the men.

– Hence the notion of a spherical Earth was making slow progress. Aristotle (384-322 BC) gave a first estimate of the Earth's circumference: 400,000 stadia (= ca 60,000 km).[10]

– The great evolution, though, came from Eratosthenes (Ἐρατοσθένης; 275-195 BC)[11], whose theories we know only from his successors. He benefited from the new knowledge of the world afforded by Alexander the Great's expeditions and Pytheas of Massalia's naval exploration. He

10 *De Caelo*, II, 14, 298a.

11 On Eratosthenes, see e.g. G. Aujac, *Eratosthène de Cyrène, le pionnier de la géographie. Sa mesure de la circonférence terrestre,* Paris, 2001.

is aware of the fact that in order to obtain a minimum of accuracy a two-dimensional map needs to be based on precise measurements.

Eratosthenes is known for calculating the circumference of the Earth by measuring the shadows of the sun at different places (in Egypt) at a given moment [fig. 6]. He obtained a result (250,000 stadia = ca 39,375 km)[12] not far from the currently recognized measurements (ca 40,000 km).[13] He also placed grids of virtual overlapping lines over the surface of the Earth, to help situating places in the world: meridians are North-South imaginary lines, while parallels are imaginary West-East lines [fig. 7-8]. At least for Asia, he would also roughly represent areas using geometrical shapes (such as triangle, trapezium, etc.), called σφραγίδες. He considered the Earth to be divided into five climatic regions, the κλίματα: a torrid zone in the middle, two freezing zones (one at the extreme North, the other at the extreme South), and two median temperate zones (one on each side); precise measures are proposed for each of them.

Eratosthenes is the first author to use the word "geography" as the title of his book: Γεωγραφικά (*description of the Earth*). It is also interesting to note that, unlike most Greek thinkers, he is not convinced that identifying Greek with civilized *versus* non-Greek with uncivilized is all that well-founded.[14]

– Claudius Ptolemy (Κλαύδιος Πτολεμαῖος; *Claudius Ptolemaeus*; 90-168 AD) marks another important step in representing the world on a map.

He was the first to be aware of the fact that representing a 3D reality in 2D inevitably led to some distortion. Thus he proposed different types of projections of perspectives, and he improved Eratosthenes' ideas by developing a system of coordinates, with more elaborated parallels (latitudes) and meridians (longitudes).

His 8-volume *Geography* is a synthesis of the main geographical knowledge in the Graeco-Roman world in Hadrian's day (ca 125 AD), showing a unified vision of the *oikoumene*. Basically the first part of the work is a discussion of the data and the methods he used. The *Geography* contains mainly an index of place-names with, for each of them, geographical coordinates (latitude and longitude), scale, and conventional signs with legends; the maps are oriented North up, with East on the right, like our

12 Cfr Aujac, *Eratosthène,* pp. 56-57 (following P. Tannery), with discussion and divergent opinions quoted.

13 *Ibidem*.

14 Cfr Strabo, *Geography*, I, 4, 9.

maps today.

These lists of coordinates allowed Maximus Planudes (13th century) to reconstruct these otherwise lost maps, thus saving the atlas from oblivion: the two oldest Greek Manuscripts of Ptolemy's *Geography* go back to his work [fig. 9-10].[15]

In the 9th century, it was translated into Arabics, thus influencing Arab scientists. In the 12th century, Gerard of Cremona translated the Arabic translation into Latin, allowing the work's rediscovery in a Western European context [fig. 11-13]. The result being that in the late 15th century, Christopher Columbus could use a sort of reconstruction of Ptolemy's map in planning his travels and discovering the New World.[16]

It follows from all this that the development of geographical knowledge took place in two major periods: Alexander the Great's conquests and the Roman Empire's expansion. From then on, the scholarly elite will consider that the sphericity of the Earth is an ascertained reality – confirmed by the practice of astronomy. Henceforth, interest in geography waned and the discipline experienced no real improvement.

### I. D. Late Antiquity – Early Byzantium

In Late Antiquity, the tradition of this type of "theoretical" science persisted. The Alexandrian School remained most famous until the 6th-7th century. Following the Arab invasion (ca 640), what remained of it migrated to Constantinople. Hardly a great name stands out illustrating developments in this type of discipline.[17] A constant feature, however, was the tendency to associate territories with the people inhabiting them, thus mixing ethnography and geography.

In Byzantine times, geography stood somewhat apart from the educational system. It remains essentially a convenient means of transmitting the ancient, classical place-names and ethnonyms to an elite raised on classical literature. Byzantine scholars generally show a notorious preference for the use of ancient

15 Cfr A. Diller, *The Oldest Manuscripts of Ptolemaic Maps, in Transactions and Proceedings of the American Philological Association,* 71 (1940), pp. 62-67. See also J. L. Berggren and A. Jones, *Ptolemy's Geography: An Annotated Translation of the Theoretical Chapters,* Princeton, 2000 (esp. pp. 48-49).

16 Following an idea already expressed by Eratosthenes: cfr Strabo, *Geography*, I, 4, 6.

17 Other kinds of maps are preserved, though, such as the *Tabula Peutingeriana* and the so-called Madaba Map, for instance. They are the topic of another lecture in the cycle. Some interesting remarks about maps like the *Tabula Peutingeriana* and their sources may be found in: S.F. Johnson, *Travel, Cartography and Cosmology*, in S.F. Johnson (dir.), *The Oxford Handbook of Late Antiquity*, Oxford, 2012, pp. 562-594.

place- or people-names. This is a constant feature in Byzantine literature.[18]

Hence we basically find manuals, abridged versions, glossaries, scholia and commentaries of ancient geographers, such as Strabo, Ptolemy, Denys Periegetes (Διονύσιος ὁ Περιηγητής; 2nd century AD). *Excerpta* of these lost works are to be found, for instance, in Photios (9th century), Michael Psellos (11th century), Eustathius of Thessalonica (12th century). In the second half of the 13th century, however, as mentioned earlier, Maximus Planudes rediscovers (it should almost be said "exhumes") Ptolemy's *Geography*.

It is interesting to note that most of these various commentaries and abstracts of ancient geographical works have especially developed in times when the study of philosophy was flourishing: Photios, Psellos, Eustathius, etc. have a more or less marked "philosophical" profile (most marked for Psellos).

In that kind of geographical studies, therefore, the Earth has generally been considered to be a sphere since ancient times. However, that remained a postulate, and some works related to geography will not accept it or else deny it (mainly for "theological" reasons).

As another characteristic of this rather literary tradition is that the name of Constantinople appears rarely, or else under the ancient appellation of Βυζάντιον. This should not surprise us, considering that it reflects a situation valid in times when that tradition emerged – before Constantinople was created.

## II. The Biblical Tradition

Faced with such a profusion of Greek ideas about the origins and composition of the Universe, what is to be found in the Bible? The Holy Books of Judaism and later on of Christendom were written by several authors, over many centuries, and reflect an evolution in religious belief. Therefore, the cosmology they refer to is not always uniform. Moreover, it is important to keep in mind that the Bible has another goal than a "scientific" treatise's, whose aim would be to describe and explain the world as did the Greek philosophers; nor is there in it any special chapter that might be compared to, e.g., Eratosthenes' writings. Instead of cosmology, what scholars are looking for in the Bible regards the Creation.

Another important feature to take into consideration when reading the

18 For an excellent synthesis and bibliography on geography in Byzantine times, see for instance D. Angelov, *Asia and Europe commonly called East and West. Constantinople and Geographical Imagination in Byzantium,* in S. Bazzaz, Y. Batsaki, and D. Angelov (eds.), *Imperial Geographies in Byzantine and Ottoman Space.* Hellenic Studies Series 56. Washington, DC: Center for Hellenic Studies, 2013, pp. 43-68. The main features of this section are developed in that paper.

Bible is that while the Old Testament was written in Hebrew, the Christian hellenized world knew it mainly through the Greek translation of the so-called *Septuagint* (LXX). There is not only a difference of language, but also (and maybe is it the most important feature here) of mentality. At least in the beginning, the Word of the Creation in the Hebrew Old Testament was not the same as the Greek philosophers' *Logos*, and the Biblical "cosmogony" is closer to those of other Near Eastern civilizations, like in Greek mythology'.[19]

Neither in this part of the investigation could we pretend to exhaustivity, but only provide milestones in order to give an idea of the Biblical thought(s) on the subject.

According to the Biblical texts, two different models regarding the process of Creation existed in ancient Israel: the model of "logos" (λόγος, *word*), and the model of "agon" (ἀγών, *struggle*). Both models are mentionned in the Psalms.

### II. A. The *Logos* Model[20]

In the model of the Word, God speaks and creates order and existence out of dormant (still) matter. Cfr Psalm 33[21], vv.6-7:

> "By the word of the Lord the heavens were made,
> and by the breath of his mouth, all their host.
> He gathers the waters of the sea as a heap;
> he puts the deeps in storehouses."

### II. B. The Model of *Agon*

In the Struggle model, on the other hand, God is fighting against sea monsters at the beginning of the world, in order to mark his sovereignty and power. It is alluded to in Psalm 74[22], which opens with a lament of the people whom God abandons, and their tribulations. They then ask him to remember his past acts (vv. 13-14):

> "You divided the sea by your might;
> you broke the heads of the sea monsters on the waters.
> You crushed the heads of Leviathan;
> you gave him as food to the creatures of the wilderness."

19 See for instance L. Derousseaux (ed.), *La création dans l'Orient ancien* (Lectio Divina, 127), Paris, 1987, chap. 1-3; R.J. Clifford, *Creation Accounts in the Ancient Near East and in the Bible*, Washington, 1994.

20 All biblical quotations reproduce *The Holy Bible, English Standard Version* (2011).

21 Psalm 32 LXX= 33 Hebrew.

22 Psalm 73 LXX = 74 Hebrew.

According to that vision of the world, the seas are the primordial forces of disorder, and the work of creation was preceded by a divine struggle. This is a presentation that echoes the mythological stories of Greece (or other civilizations), traces of which can be found in the apocalyptic but future-oriented narratives: according to the author of the Book of Revelations, indeed, after the final victory of God over the sea-monsters, new Heavens and a new Earth will be inaugurated in a cosmos where there will be "no more sea" (Rev. 21:1).[23]

## II.C. Evolution[24]

The narrative of the creation in *Genesis* (Gen. 1) is the quintessence of the "Logos" myth. It also begins with darkness and an uncreated primordial ocean: God separates and holds back the waters, but he does not create them out of nothing. He initiates each creative act with a word ("And God said…"), completing this act by giving a name to the created item: "Let there be light", for instance.

Creation via verbal process is not peculiar to the Old Testament. It is also found in some Egyptian traditions. With a notorious difference, however: in *Genesis*, the divine word is the act of "making"; while the word of the Egyptian creating god is a quasi-magic activation of something inherent in pre-creation.

The pre-exilic Old Testament (before 586 BC) acknowledges the existence of an assembly of divine servants, who helped God in making decisions for Heaven and Earth. However, in these texts there is nothing equal to Him in Heaven.

The post-Exilic writers of the Wisdom tradition (e.g. the Book of Proverbs, the Wisdom of Solomon, etc.) developed the idea that Wisdom, later identified with the Torah, existed before the creation and had been used by God to create the Universe. Converging with the ideas of some Greek philosophers, according to whom Reason tied the Universe together, the wisdom tradition of wisdom teaches that the Wisdom of God, his Word and his Spirit are the basis of cosmic unity.

Christianity, in turn, adopted these ideas and applied them to Jesus; the most brilliant reference is in the Gospel of John (1:1), where he is identified

23 Cfr G. Lambert, *La Création dans la Bible*, in *Nouvelle Revue Théologique*, 75 (1953), pp. 252-281 (p. 279).

24 It may be useful to recall, for readers not familiar with Biblical writings, that the Bible is an organized item: the order of the Books is not chronological, and the *Genesis* account is not the oldest Creation account of the Bible. See e.g. J. Vermeylen, *Création et ordre du monde dans l'ancien testament*, in *La foi et le temps*, n.s. 1 (1981), pp. 499-524; G. Lambert, *La Création dans la Bible*, in *Nouvelle Revue Théologique*, 75 (1953), pp. 252-281.

with the creative word ("In the beginning was the Word, and the Word was with God, and the Word was God").

### II. D. The Shape of the World According to the Bible

Regarding the representation of the world proposed in the Bible, there is no systematic exposition on the subject, as I recalled. However, one can reconstruct the vision of a 3-part world, with the heavens (*shamayim*) above, the earth (*eres*) in the middle, and the underworld (*sheol*) below [fig. 14].[25]

This tripartite world floated upon the *Tehom* (the cosmic ocean), which covered the Earth until God created the firmament to divide it into upper and lower parts, thus revealing the dry land. Since then, the world has been protected from the cosmic ocean by the firmament's massive dome. The cosmic sea is the home of the monsters God fights. This design has many points of convergence with Ugaritic texts.[26]

In the Old Testament, the word *shamayim* represented both the atmospheric sky, and God's dwelling place. The firmament – that is, the visible sky – was named by another term (*raqia*).[27] It was described as a solid bowl, inverted above the Earth, of a celestial blue color above the ocean [fig. 14]. Rain, snow, wind and hail were stored in warehouses outside the *raqia*, which had "windows" to let them pass (as happened during the Flood: the waters were passed when the "windows of the sky" were opened).[28] Heaven extended downwards and joined the farthest edges of the Earth;[29] the man looking at the sky from the Earth saw the floor of the Heavens, made of blue gems (lapis lazuli or sapphire, according to the translations of Exodus 24:9-10),[30] just like the throne of God (Ezek. 1:26).[31]

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25 For all Hebrew words, see e.g. L. Koehler and W. Baumgartner (*et al.*), *The Hebrew and Aramaic Lexicon of the Old Testament* (English translation by M.E.J. Richardson, Study edition in 2 vol., Leiden, 2001).

26 See e.g. J.-L. Cunchillos, *Peut-on parler de mythes de création à Ugarit?*, in Derousseaux, *La Création dans l'Orient ancien*, pp. 79-96 (= Chap. 2); Chap. 4-12 in the same book examine the Creation topic in diverse biblical books.

27 Importance of the vocabulary: cfr J. Vermeylen, *Le motif de la création dans le Deutéro-Isaïe*, in Derousseaux, *La Création dans l'Orient ancien*, pp. 183-240 (esp. 213-sqq).

28 For examples, see Gen. 8:12, Jr 10:13 or Jb 38:22.

29 Cfr. Deut. 4:32: "(…) ask from one end of heaven to the other, whether such a great thing as this has ever happened or was ever heard of."

30 Exodus 24:9-10: "Then Moses and Aaron, Nadab and Abihu, and seventy of the elders of Israel went up, (10) and they saw the God of Israel. There was under his feet a pavement of sapphire stone, like the very heaven of clearness." LXX (*A New English Translation of the Septuagint*, Albert Pietersma and Benjamin G. Wright (ed.), Oxford, 2007): "like something made from lapis lazuli brick and like the appearance of the firmament of heaven in purity."

31 Ezekiel 1:26: "And above the expanse over their heads there was the likeness of a throne,

Grammatically, the word *shamayim* can be either dual (two) or plural (more than two), without completely excluding the singular (one).[32] Therefore, it cannot be entirely clear whether there were one, two, or more skies according to the Old Testament. However, it is likely there was only one, with expressions like "heavens of heavens" being intended to emphasize the immensity of God's Kingdom.

Heavenly bodies (namely: sun, moon and stars) have been worshipped as deities, a practice disapproved of by the Bible[33] and against which charge the righteous Job protests his innocence.[34]

In the early Old Testament texts, the *bene elohim* were gods (secondary divinities), but later they became angels, God's "messengers" (*malakim*), whom Jacob sees ascending and descending from a "ladder" (actually a heavenly mountain) between Heaven and Earth. In early works, the messengers were anonymous, but in the Second Temple period (539 BC-100 AD), they began to receive names, and eventually became the great angelic orders of Christendom and Judaism.[35]

## II. E. Cosmic Geography

In Old Testament times, the Earth is often considered as a flat disc floating upon the water (Isaiah 40:22: "It is he who sits above the circle of the earth").[36] The concept was apparently quite similar to that depicted on a Babylonian map dating back to about 700 BC: a unique circular continent delimited by a circular sea; beyond the sea, there are a number of equidistant triangles called *nagu* (i.e. "Remote areas"), apparently islands or possibly mountains [fig. 15].[37]

in appearance like sapphire". LXX: "Like an appearance of a lapis lazuli stone was the likeness of a throne upon it."

32 P. Joüon – T. Muraoka, *A Grammar of Bibical Hebrew*, 2nd ed. revised (Subsidia biblica 27), Rome, 2011, § 90f and 91f, p. 249 and 252 (original French edition, 1923). Actually, the word is never used in the singular, but always plural, with an apparent dual final (it is an abnormal plural, not a dual).

33 See e.g. Lambert, *La Création*, pp. 260-261 and n. 31.

34 Job 31:26-28: "if I have looked at the sun when it shone, or the moon moving in splendor, and my heart has been secretly enticed, and my mouth has kissed my hand, this also would be an iniquity to be punished by the judges, for I would have been false to God above."

35 See *Dictionnaire encyclopédique de la Bible*, s.v. *ange* (pp. 59-62), for the general pattern of the evolution and biblical references; and, more recently: C.A. Newsom, *Angels. Old Testament,* in *The Anchor Bible Dictionary,* vol. 1, New York, 1992, pp. 248-253; D.F. Watson, *Angels. New Testament, ibid*., pp. 253-255.

36 Cfr Lambert, *La Création*, p. 258 and n. 15.

37 For description, comment and bibliography on the Babylonian map, see e.g. A. Gasche, *The Persian Gulf Shorelines and the Karkheh, Karun and Jarrahi Rivers: A Geo-Archaeological Approach*, in *Akkadia* 128 (2007), pp. 1-72, esp. 48-52 and fig. 75.

The Old Testament also locates islands next to the Earth (cf. Psalm 97:1);[38] these are the "ends of the Earth" (according to Isaiah 41:5)[39], or the extreme edge of Job's circular horizon (Job 26:10)[40], where the vault of heaven rests on the mountains.

Other passages in the OT suggest that the Heavens rest on pillars (such as Psalm 75:3; 1 Samuel 2:8; Job 9:6)[41], on foundations (Psalms 18:7 and 82:5)[42], or on a "support" of whatever sort (Psalm 104:5).[43]

In the Book of Job, though, the cosmos is imagined as a vast tent, with the Earth being used as the floor and the sky as the tent itself; from the edges of Heaven, God suspends the Earth upon "nothing", that is the vast ocean, solidly underpinned, linking it to Heaven (Job 26:7: "Stretching out the north[44] over nothing, hanging the earth upon nothing"). If the technical means by which God prevents the Earth from sinking into the waters of Chaos are not explicitly described, it is nevertheless clear that He does so by virtue of his personal power.

The notion of a spherical Earth, as seen above, was developed by Greek thinkers from the 6th century BC on. From the 3rd century BC on, it was generally accepted by educated Romans and Greeks, and even by some Jews. The author of the Revelation, however, supposes a flat Earth (7:1).[45]

The question of whether the Earth was flat, as the Scriptures seem to indicate, or spherical, as the Greeks taught, was a field of frequent disagreement in the Church of the early centuries.

38 Psalm 96 LXX = 97:1 H.: "The Lord reigns, let the earth rejoice; let the many coastlands be glad!"

39 Isaiah 41:5: "The coastlands have seen and are afraid; the ends of the earth tremble; they have drawn near and come."

40 Job 26:10-11: "He has inscribed a circle on the face of the waters, at the boundary between light and darkness. The pillars of heaven tremble and are astounded at his rebuke."

41 Psalm 74 LXX = 75:3 H.: "When the earth totters, and all its inhabitants; it was I who keep steady its pillars."
1 Samuel (= 1 Reigns LXX) 2:8: "He raises up the poor from the dust; he lifts the needy from the ash heap to make them sit with princes and inherit a seat of honor. For the pillars of the earth are the Lord's, and on them he has set the world."
Job 9:6: "[he] who shakes the earth out of its place, and its pillars tremble (…)."

42 Psalm 17 LXX = 18:7 H.: "Then the earth reeled and rocked; the foundations also of the mountains trembled and quaked, because he was angry."
Psalm 81 LXX = 82:5 H.: "They have neither knowledge nor understanding; they walk about in darkness; all the foundations of the earth are shaken."

43 Psalm 103 LXX = 104:5 H.: "He set the earth on its foundations, so that it should never be moved."

44 = the northern part of the firmament, on which it was supposed to turn on the void.

45 Revelation, 7:1: "After this I saw four angels standing at the four corners of the earth, holding back the four winds of the earth (…)."

There are still many other things to add to this section, but what has been said earlier shows how far the Books of the Bible were from preoccupations such as the physical construction and composition of the Universe: even texts telling us how God created Heaven and Earth were composed after the account of his liberating his People. In the preserved state of the Bible, it was not of first importance, unlike what may be observed in other cultures.[46]

## III. Cosmas Indicopleustes

In the 6th century, in one of the most prosperous provinces of the Byzantine Empire, most famous also for the so-called Alexandrian exegetical School, a rather peculiar work echoes the difficulty some Christians experienced in reconciling the two ways of thinking inherited from the past: the "scientific" way, based on the observations and successive reasoning of generations of scientists associated with pagan culture, and a way in accordance with the sacred books of Christianity.

This work is particular in more ways than one: neither its title nor its author are known with certainty. Moreover, it is transmitted by three illuminated manuscripts, which is quite unusual.

### III. A. The Author

The earliest evidence of this work is found in Photios' so-called *Βιβλιοθήκη* or *Μυριόβιβλος* (*Library* or *Myriobiblos*). This Byzantine 9th century writer played an important role in civil administration before being twice elevated to the dignity of Patriarch of Constantinople, as well as being famous for his literary works.

His *Library* assembles some sort of reading cards, where he gives his opinion on over 200 books, some of which would never have come to our attention otherwise. Regarding the work concerning us here, Photios indicates (in *Cod*. 36) that it is the work of "a Christian". What is it to be inferred from this indication? Was the author's name missing from the manuscript Photios was reading? Or did he have such a bad opinion of its author that he did not want to take the trouble to note it? Impossible to know. Of the three preserved manuscripts, only one (11th century), gives an author name: Κοσμᾶ μοναχοῦ ("by a monk Cosmas"). Yet this name seems added by a much later hand.

It would not be impossible, according to W. Wolska-Conus[47], that the book

46 See e.g. Lambert, *La Création dans la Bible*, pp. 253-255.

47 W. Wolska-Conus (ed.), *Cosmas Indicopleustès, Topographie chrétienne*, vol. 1-3 (Sources chrétiennes 141, 159, 197), Paris, 1968-1973. The rich Introduction of the first volume makes an excellent synthesis on the subject, and completes a precedent study by the same author: W. Wolska, *La Topographie chrétienne de Cosmas Indicopleustès. Théologie et*

were published anonymously on purpose. The tone of the second part (books VI and following) tends to show that it aroused some kind of controversy, and that mentioning the author's name would not have served his interest.[48] Where, then, would this name (Cosmas) come from? Researchers have proposed that a late tradition would have associated it with that work because of the phonetic vicinity of the Greek word κόσμος (*world*, *universe*), by a play on words (pun). Other such cases are known, namely John, author of a book called Κλῖμαξ (*ladder*), received the nickname of *climacus* because his book is designed as a ladder to be climbed up to reach God. But some scholars believe this very ingenious explanation is precisely too ingenuous to be considered.[49] As for describing him as a "monk", it is not supported by any information at our disposal.

W. Wolska-Conus' last theory would identify the author with Constantine of Antioch, also a 6th-century author.[50] But the most usually admitted hypothesis assigns him an Alexandrian origin.[51]

We do not know much about the author; what we know, we learn it through his work: he was a merchant, or at least someone who, for commercial reasons, has traveled intensively in different parts of Egypt, Ethiopia, the shores of the Red Sea, Ceylon (Taprobane). There is some discussion as to whether he actually reached India, or whether his information on the subject is second-hand. It is however from this quite hypothetical journey to India that he received his nickname: "Indicopleustes", which literally means "navigator in India".[52] Yet this epithet does not appear in the manuscripts before the 11th century. When Cosmas was not travelling, he seems to have spent his life in Alexandria and around, hence the theory regarding his Alexandrian origins.

As far as we may see, he was a man without any particular literary or scientific education, and certainly not a professional writer or scholar. Everyone (since Photios) agrees about his style mediocrity. He might have written other books; in this case, they are lost.[53] He was a very pious man, but of Nestorian

*science au VI*e *siècle* (Bibliothèque byzantine. Études, 3), Paris, 1962.

48 This is affirmed from the very beginning of the Introduction of Wolska-Conus, *Cosmas*, vol. 1, p. 15, and repeated; see e.g. pp. 59-61.

49 Such an opinion has already been defended for instance by H. Leclercq in *Dictionnaire d'Archéologie Chrétienne et de Liturgie* (1928), s.v. *Kosmas* (I,1, coll. 820-849, esp. 820).

50 W. Wolska-Conus, *Stephanos d'Athènes et Stephanos d'Alexandrie: Essai d'identification et de biographie*, in *Revue des Études Byzantines*, 47 (1989), pp. 5-89. But I must admit that her arguments fail to convince me.

51 See e.g. M.V. Anastos, *The Alexandrian Origin of the "Christian Topography" of Cosmas Indicopleustes*, in *Dumbarton Oaks Papers*, 3 (1946), pp. 73-80.

52 NB: Liddell-Scott, s.v., gives the meaning of "dyer" (hence "indigo").

53 Some consider the last two books of the *Topography* to be part of those lost supposed works.

confession (although Egypt was mostly monophysite). This element may corroborate the hypothesis of a deliberately anonymous publication.

### III. B. Manuscripts

Cosmas' work is transmitted by three manuscripts: the oldest one is preserved in the Vatican Library; the other two, more or less contemporary, are considered to have been written two centuries later: one is kept at St. Catherine in the Sinai, the other at the Biblioteca Laurenziana in Florence. All three are remarkable in that they are illuminated books (even if the images have suffered the ravages of time!).

a) *Vaticanus* (V) = *Vat. Gr.* 699;[54] copied in capitals in the 9th century, in Constantinople; it is the closest to the original, but its spelling is very bad; moreover, a comparison with the other witnesses shows that several folios with images were ripped out.

b) *Sinaiticus* (S) = *Sin. Gr.* 1186;[55] kept in St. Catherine Monastery (Sinai); written in minuscule, in the 11th century, possibly in Cappadocia. Here too, several folios were ripped off.

c) *Laurentianus* (L) = *Laur. Plut.* IX.28;[56] copied in minuscule, in the 11th century, in Iviron (Mt Athos). Many leaves were removed, so that the illustration is not always facing the right text.

For the study of the tradition, I rely entirely on W. Wolska-Conus' research. Both manuscripts of the 11th century are a family. To approach the original state of the book, though, it is important to consider all three witnesses together, studying the text as well as the illustrations. A careful study of these witnesses allows to postulate a reworked copy, that has been lost, between the original (which possibly included only books I-V) and the *Vaticanus*; and at least another revised copy, also lost, between the *Vaticanus* and the two other manuscripts. These observations allowed W. Wolska-Conus to propose a *stemma codicum*.[57]

54 Available on-line on the website of the Biblioteca Apostolica Vaticana, as well as recent bibliography. For a full description, see Wolska-Conus, *Cosmas*, Introduction (vol. 1), pp. 45-47 and *passim*, and R. Devreesse (rec.), *Codices Vaticani graeci. III. Codices 604-866*, Vatican City, 1950, pp. 176-177.

55 Available on-line through the website of the Library of Congress, Washington. For a description, see Wolska-Conus, *Cosmas*, Introduction (vol. 1), p. 47 and *passim* (see also n. 1, but the actual catalogues of Saint Catherine Library give extremely limited information).

56 Available on-line on the website of the Biblioteca Medicea Laurenziana. For a full description, see Wolska-Conus, *Cosmas*, Introduction (vol. 1), pp. 48-50 and *passim* (and p. 48, n. 1), and A.M. Bandini, *Catalogus codicum manuscriptorum Bibliothecae Mediceae Laurentianae…*, Florence, 1764, I, pp. 437-440.

57 Wolska-Conus, *Cosmas*, vol. 1, pp. 44-116 (esp. p. 86).

### III. C. Title

Each manuscript begins in its own way, and thus proposes a different "title": in V, theTable of Contents (*acephalous*) is followed by the Subject Exposition; in S, there is a Prologue, the Table of contents, and the Subject Exposition (*ateleuton*); in L, the manuscript starts with a Prayer, a Prologue, then a second Prologue, followed by a gap (containing the Table of Contents and the beginning of the Subject Exposition), before the end of the Subject Exposition.

These differences can probably be explained by the defective state of the models from which the extant manuscripts derive. However, a comparison of the three witnesses makes it possible to reconstitute the following title: "Book named by us 'Christian Topography', which includes the entire cosmos." This formula is repeated in the Table of Contents for Book V, and so is the work traditionally named.[58]

### III. D. Content[59]

The *Christian Topography* includes XII books. It seems that books I to V are the original form of the work. Scholars agree that the next books adopt a more disillusioned tone, more controversial too, even more aggressive. They interpret it as a response to the "tepid" reception this first version would have met. Moreover, regarding the content, there is nothing much new: books VI to X are essentially variations on the same theme.

The Prologues and Table of Contents expose the subject, arranged in five books, and evolving around two main topics:

1) a cosmographic theme, whose starting point is the Jewish tabernacle, designed as the copy (ἐκμαγεῖον) of the Universe, composed of two superimposed spaces (Expo, 6);

2) and a prophetic theme, as the conception of the two spaces Universe is based upon the concept of the two human "conditions" (καταστάσεις), present and future, humanity successively passes through (Expo, 7).

The rest of the work only develops these two ideas, with lots of "arguments" (many of which are merely Biblical quotations).

– Book I: Against those who claim to be Christians but profess the pagan ideas of the sky's sphericity

– Book II: Christian theories on the form and disposition of the Universe draw their evidence from the Holy Scripture (with 'sections' and 'digressions')

58 See Wolska-Conus, *Cosmas*, Introduction (vol. 1), part. pp. 59-61.

59 Here also, W. Wolska-Conus' presentation (pp. 19-36) is extremely clear and useful.

– Book III: develops the basic doctrine (primacy of Scripture over the Pagans' theories), supported by Scriptural arguments (mainly Moses and Saint Paul) (with 'sections' and 'digressions')

– Book IV: Concise summarization, with illustration, of the forms of the Universe according to the Holy Scripture, and refutation of the sphere (this is where most of the *Christian Topography* cosmographic drawings are found)

– Book V: Description of the tabernacle. Agreement of Prophets and Apostles (= theological counterpart to the cosmology of books II to IV).

The text of the *Christian Topography* originally stopped with a prayer at the end of Book V (V, 257). There is also a kind of final signature, as well as at the end of books VII, 97 and VIII, 31. "Only these first five books present a certain order and unity (...). The following books add nothing essentially new. They provide the sympathizers some additional explanations, but mostly respond to criticisms."[60]

– Book VI: About the size of the sun

That book was later attached afterwards to the *Christian Topography* (cf VII, 4). It is possibly a revised extract from Cosmas' lost geography book. It is basically controversial, discussing questions of astronomy.

– Book VII: On the permanence of the Heavens, the work of a Christian.

A polemical book, written at the request of a certain Anastasius, to refute a "pretended Christian" contemporary of Cosmas, a supporter of the celestial sphere (doubtlessly John Philoponus). This book is much less structured than the previous ones.

– Book VIII: On the Song of Hezekiah, King of Judea, and on the retrogradation of the sun.

This book was written at the request of a certain Peter, Cosmas' friend. It has many references to Patrikios-Mar Aba. It is mainly an explanation of the Song of Hezekiah after Isaiah 38. The exegetical commentary of the passage (where the ten astronomical degrees are assimilated to the ten steps of Hezekiah's house) turns into refuting the celestial sphere (the sky = a vault). Moreover, this revelation was made not only to Jews, but also to Babylonians, Medes and Persians.

– Book IX: On the course of the heavenly bodies. The book is rambling and repetitive, with some exceptions.

– Book X: Quotations of Church Fathers, interpreted favorably to Cosmas' thesis. The tone is defensive more than accusing. There are,

60 Wolska-Conus, *Cosmas*, vol. 1, p. 29.

particularly, quotations from Athanasius, *Festal Letters*; Gregory of Nazianzus, *Or.* 45; Theophilus of Alexandria, *Festal Letters* I and X; and the more interesting are from Severian of Gabala, *Hexaemeron*.

*L* and *S* supply even more testimonies, like Epiphanius of Salamina, *On weights and measures*; John Chrysostom, *Sermon on almsgiving* and *Commentary on the Epistles of St. Paul*; Philo of Carpasia, *Commentary on the Song of Songs* and *Hexaemeron*; etc. (shifting towards the Christological problem).

– Books XI and XII: absent from *Vaticanus*, they are later additions to *Christian Topography* (= fragments of the lost book on geography?)

The work's title is thus explained perfectly: "Topography" is to be understood as a description of the cosmic space in accordance to the eschatological views of a specific Christian group; this title does not cover the geographical or topographical content of the work. This description corresponds to a "theory imposed by a religious conception embracing the physical world as well as the spiritual world, the present world as well as the future world"; and it is "Christian" as opposed to the pagan systems and to the "false Christians" who follow their doctrines.

### III. E. Cosmas at the Crossroad of Two Schools

Cosmas is sort of enigma. His case arouses interest for the following reason: he was Alexandrian (wether by adoption or birth is hard to say), but admits following and adopting doctrines of a master of the School of Nisibis, in turn deriving from the Antiochene School. Where does that lead us?

It is well known that the exegetical Schools of Alexandria and Antioch proposed different, sometimes opposite, visions in apprehending the Holy Scriptures. Moreover, two very different tendencies in Christianity crystallized there, Alexandria and Egypt being mainly Monophysites, and Antioch Nestorian. Leaving aside doctrinal differences, which would bring nothing to our purpose except to emphasize different ways of living Christianity, let us briefly focus on the differences in the exegetical approach.[61]

a) The Alexandrian School

In Alexandria, allegory is privileged. Allegory, that is, a reading of the

61 The oppositions between the Alexandrian and Antiochene Schools and between the notions of *allegoria* and *theoria* are presented in a nuanced way in (for instance): Fr.M. Young, *Biblical Exegesis and the Formation of Christian Culture,* Cambridge, 1997, pp. 161-185, and H. Patapios, *The Alexandrian and the Antiochene Methods of Exegesis: Towards a Reconsideration,* in *Greek Orthodox Theological Review* 44 (1999), pp. 187-198. More specifically about the Antiochene vision, see R. Hill, *Reading the Old Testament in Antioch* (Bible in Ancient Christianity, 5), Leiden, 2005.

Scripture that detects behind the first, literal sense, one or more other senses for the same passage or the same figure. Alexandrian exegesis seeks multiple interpretations, symbolic, sometimes far-fetched; in any case, it is impossible for it to be satisfied with a simple first-degree reading of the Biblical texts. Thus, for instance, Origen (Ὠριγένης, 184-253), the great didascalos of the Alexandrian School, sees in the ark of Noah, in addition to a "boat" – or rather a chest (literal sense) – different things: for him, it is also a symbol of the Christian's soul ("psychic" or "moral" sense: the waves are the passions, in which the soul must not be submerged), and a prefiguration of the Church (allegorical meaning).

b) The Antiochene School

Conversely, the School of Antioch gives priority to the historico-literal interpretation: so, Noah's ark is a boat, a chest. Full-stop.[62]

In the Antiochene School, the teachers strove to find a rigorous method of careful exegesis for the Biblical texts, based on the rules of grammar and literary criticism. This method required solid intellectual training, and an adequate familiarity with all disciplines (such as history, geography, etc.) to elucidate all the allusions in the texts. The Antiochians admitted in principle only the literal and historical interpretation of the texts, rejecting any "allegorical meaning," "spiritual sense," "hidden meaning," etc., which had been used and abused by the Alexandrian School since Origen.

They did not think that all Biblical texts were equally inspired, and the authority granted them varied: Holy Scripture, of course, was generally inspired by God, but written by men, within particular historical contexts, and according to the human mind. The insistence of the Antiochians on the historical meaning of biblical texts did not prevent their also asserting the existence of what they called the "typological meaning", which they clearly opposed to the Alexandrian "allegory". Thus the prophecies of the Old Testament refer to specific historical situations, which the exegesis must restore; at the same time, though, their general inspiration announces Christ. For instance: the People' slavery in Egypt was a real event, to be placed in its historical context, while also symbolizing the slavery of sin, etc.

62 It should be noted, however, that according to Apelles (who did not belong to either School), this literal interpretation is just impossible: as he points out, indeed, according to the dimensions given in the Bible, the Ark would in fact be full with only one couple of elephants; so where could all the other animals find place? Cfr Origen, *Homilies in Genesis*, II, 2 (PG 12, 163-166), referred to in J. L. Thompson, *Genesis* 1-11 (Reformation Commentary on Scripture Series, 1), 2014, pp. 249-250 (with a small confusion in the reference).

This literalistic approach to biblical texts also led the theologians of Antioch to support a cosmology alien to the achievements of Greek science: according to them the Earth was flat and the Ark of the Covenant was the image of the Universe. This "unscientific" conception remained in the Nestorian Church, and found expression in the 6th century *Christian Topography*.

Theodorus of Mopsuestia (ca 350-428) is one of the great names of the Antiochene School. His disciples Patrikios (identified with the Mar Aba, master of Cosmas) and Thomas of Edessa went to Alexandria, where they participated in discussions between supporters of both Schools.

### III. F. Shape of the World and Cosmic Symbolism

Cosmas insists on the two human conditions (*catastaseis*): the one we live here and now, and the one we shall live in the Kingdom of Heaven. This doctrine requires a world with two superimposed spaces, a world shaped like a two-storey building. Accordingly, drawings of the *Topography* representing the Universe show a rectangular construction, divided horizontally in two parts, and covered with a barrel vault. Moreover, Cosmas' correlation between the Universe and the tabernacle, as model and copy, specifies the resemblance of the cosmos to a building. Cosmas abandons cosmography for the symbol. Except for the horizontal separation, the shape of the Universe corresponds to the pattern of the tabernacle (where the separation is vertical though).[63]

However, inside this Universe similar to the tabernacle, Cosmas draws the inhabited Earth (*oikoumene*), with its gradual rise from South to North, the ocean with the four gulfs, and the land beyond, thus returning to ancient cosmography and geography; the physical Universe and the physical building end up forming just one figure.

Where did this notion of the Universe in the form of the tabernacle come from? The cosmic symbolism of the tabernacle was put forward by Philo of Alexandria and Flavius Josephus, two Jewish writers imbued with Greek culture. However, that did not prevent them from considering the world as spherical, according to the science of their time.[64]

For Theodore of Mopsuestia and the Antiochene School, the tabernacle

63 The tabernacle illustrations are well studied in both Cosmas manuscripts and the illuminated Octateuchs. See e.g. L. Brubaker, *The Tabernacle Miniatures of the Byzantine Octateuchs*, in *Actes du XVe Congrès International d'Études Byzantines, Athènes, Septembre 1976.* II. *Art et archéologie. Communications,* A, Athènes, 1981, pp. 73-92 ; K. Weitzmann and M. Bernabo (with the collaboration of R. Tarasconi), *The Byzantine Octateuchs* (The Illustrations in the Manuscripts of the Septuagin, II) (2 vol.), Princeton, 1991.

64 Textual references to Philo's and Josephus' passages are found in A. G. Holder, *The Mosaic Tabernacle in Early Christian Exegesis*, in E. A. Livingstone(ed.), *Biblica et Apocrypha, Orientalia, Ascetica* (Studia Patristica, vol. XXV), Leuven, 1993, pp. 101-106.

for which Moses received very precise construction instructions (cf. Exodus 25:40) is a copy of the creation, and determines the structure of the world.

Cosmas, on the other hand, converts symbolism into physical reality. For him, the shape and division of the tabernacle are unambiguous evidence of the shape and spatial division of the Universe, rigorously divided in two parts: the abode of the visible and that of the invisible, the container of the celestial condition and that of the human condition... There is however a difference between Cosmas' Universe and the tabernacle: the vertical division (curtain) of the tabernacle is replaced by a horizontal division (firmament) in the cosmos, in order to obtain two superimposed spaces. The notions of high and low thus acquire a fundamental meaning, low being the seat of all that is perishable, and high being reserved for the eternal.

### III. G. Illustrations

The most interesting part of the *Christian Topography* is of course composed of the illustrations, whose origin goes back to Cosmas.[65] They respond to the *Topography*'s double thematic: the Universe (with the two *catastaseis*), and the "prophecies" or prefigurations that are found essentially in the OT. Most interesting are the illustrations related to the worldview of Cosmas, and its "model".

The first illustration of direct interest to our theme is Ephorus' map (Book II, chap. 80 = *Laurentianus*, fol. 46v; *Sinaiticus*, fol. 34r; *Vaticanus*, fol. 19r). Cosmas was indeed looking for testimonies by Ancients confirming his theses, and found a particularly good ally in Ephorus. This historian of the 4th century BC wrote a *Universal History* in 29 books. The work is naturally lost, except for extracts quoted for instance by Diodorus Siculus. Ephorus is one of the first historians to consider geography worth taking into account in the study of history, and his name remains attached to a map that had some success before those of Ptolemy and Strabo.

According to Ephorus, the Earth was a flat rectangle, whose cardinal boundaries, designated according to the winds, were represented by the Scythians (North), the Indians (East), the Ethiopians (South), and the Celts (West). He thought Scythia and Ethiopia were the two largest areas. Cosmas

65 Their inspiration can be found in preexisting cycles, at least partly. See Wolska-Conus, *Cosmas*, Introduction (vol. 1), pp. 124-231; she proposes a survey and table (SC 141, pp. 158-171, reconstruction: pp. 180-229). These conclusions are still followed by recent scholars, such as V. Cantone, *Fonti cartografiche e cosmologia nel testimone vaticano della Topografia Cristiana di Cosma Indicopleuste*, in *Religioni per via (= Quaderni di storia religiosa*, 13 [2006]), pp. 157-180.

tells us that Ephorus illustrated his text with "annexed drawings". Actually, this map is best known to us through Cosmas' manuscripts.

> TC, II, 78: *Among the ancient philosophers who have somewhat explored and described the inhabited earth, there are some who have also defined, in a way very close to that of the divine Scripture, the position of the earth and the revolution of the stars. Let one of them come forward and speak.*
>
> Excerpt from the fourth book of the History by Ephorus.
>
> [TC, II, 79] *The Indians inhabit Apèliotes and the region near the Orient; the Ethiopians occupy the region which extends towards Notos and towards the South; the Celts hold the country which is on the side of Zephyr and the West; the Scythians live in the region of Boreas and Ourses. Their shares are therefore not equal: those of the Scythians and Ethiopians are larger, those of Indians and Celts smaller. However, the respective dimensions of these regions two-by-two are substantially the same. The Indians, indeed, are between the summer sunrise and the winter sunrise, while the Celts occupy the country from the summer sunset to the winter sunset. This part equals the other as to the extent, and is in a sense quite at its opposite. The abode of the Scythians occupies a region that does not see the revolution of the sun; it faces the Ethiopian people, which seems to extend from the early winter to the shortest day.*
>
> [TC, II, 80] Digression. This Ephorus is an ancient writer, philosopher and historiographer."[66]

All three manuscripts include a drawing of Ephorus' map, an elongated rectangle designated as the "earth" by an inscription in the middle. All around, the names of the directions of the Universe can be read.

Cosmas concludes his quotations saying: "With precision, with the aid of text and drawing, Ephorus exposes, in the same way as the divine Scripture, the position of the Earth and the revolution of the stars."

Most illustrations are in books IV and V. Here is a list of the more "geographical" illustrations with a synthesized presentation of their presence in the manuscripts.

1. IV, 1: Heaven and Earth together: *L* (f. 90v); *S* (f. 65r); omitted in *V*
2. IV, 2: Universe seen from East or West: *L* (f. 91r); *S* (f. 65v); *V* (f. 38v)
3. IV, 3: Universe seen from North to South (cosmic building): omitted in *L* and *S*; *V* (f. 39v)
4. IV, 6-7: Mappa Mundi (relief): *L* (f. 92r); *S* (f. 66r); omitted in *V*

66 Greek text: Wolska-Conus, *Cosmas*, vol. 1, pp. 395-397.

5. IV, 7: Mappa Mundi (contour): *L* (f. 92v); *S* (f. 66v); *V* (f. 40v)

6. IV, 10: Elevation of the Earth (South-East side): omitted in *L* and *S*; *V* (f. 41v)

7. IV, 15: Elevation of the Earth (North-West side): *L* (f. 95r); *S* (f. 68v); *V* (f. 42v)

8. IV, 15b: Earth and Heaven together (cosmic building): *L* (f. 95v); *S* (f. 69r); *V* (f. 43r)

Illustrations in Book V focus on the Sinaitic revelations (about the tabernacle) and the prophetic theme (episodes from Moses' and Paul's life, for instance).

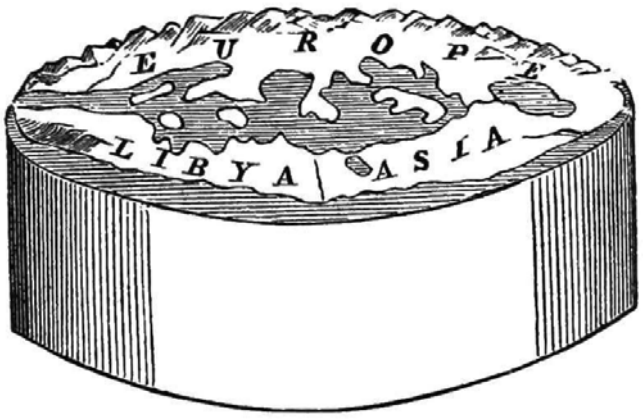
### III. H. Conclusion

To close this cycle of lectures dedicated to various aspects of cosmology etc. in Antiquity and Early Byzantium, I would like to mention an interesting seminar organized by Emilie Villey, in Paris. She gathers people interested in the History of Sciences, to examine how major theories or conceptions developed in Antiquity were capable of surviving in the Middle Ages. What is interesting is that the scholars she gathers are not only specialists of the Western Middle Ages; she also brought into her group some Orientalist scholars, taking into account Oriental authors such as, for example, Cosmas, Severian of Gabala, John of Damascus, etc. She has focused on a selected topic (last year, it was about the destiny of the fifth element), and the gathered information is made available in synthetic files displayed on a map.

This interesting initiative clearly demonstrates that Cosmas' view does not seem to have equivalent in the Western Middle Ages. However, it is found in Byzantine texts, not necessarily connected to Cosmas: such a famous writer as John of Damascus, for instance, in his treatise *De fide orthodoxa* or *Expositio fidei* (CPG 8043), refers to a 'cubic' world, and he is not alone in doing so.[67]

67 On the subject, see Anne-Laurence Caudano's publications: "*Le ciel a la forme d'un cube ou a été dressé comme une peau*": *Pierre le Philosophe et l'orthodoxie du savoir astronomique sous Manuel I*[er] *Comnène,* in *Byzantion* 81 (2011), pp. 19-73; and Ead., *Un univers sphérique ou voûté? Survivance de la cosmologie antiochienne à Byzance (XI*[e] *et XII*[e] *s.),* in *Byzantion* 78 (2008), pp. 66-86.

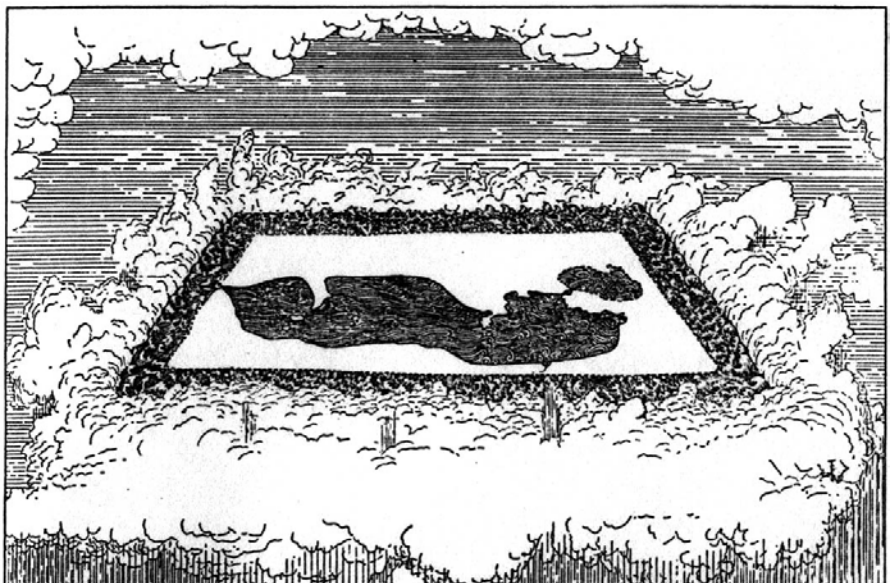
# Appendix



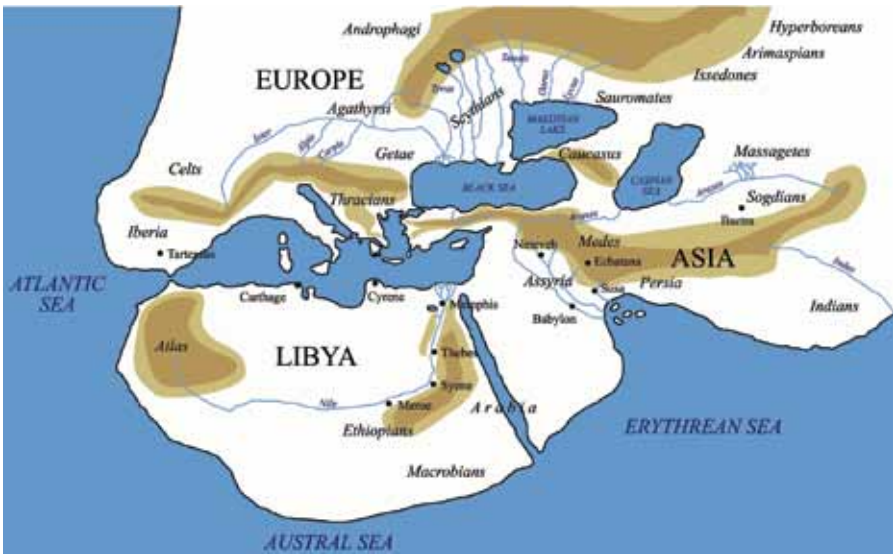

1. 3D-reconstruction of Anaximander's cylindrical Earth (source: Wikicommon)


2. Anaximander's map (reconstruction) (source: Wikicommon)

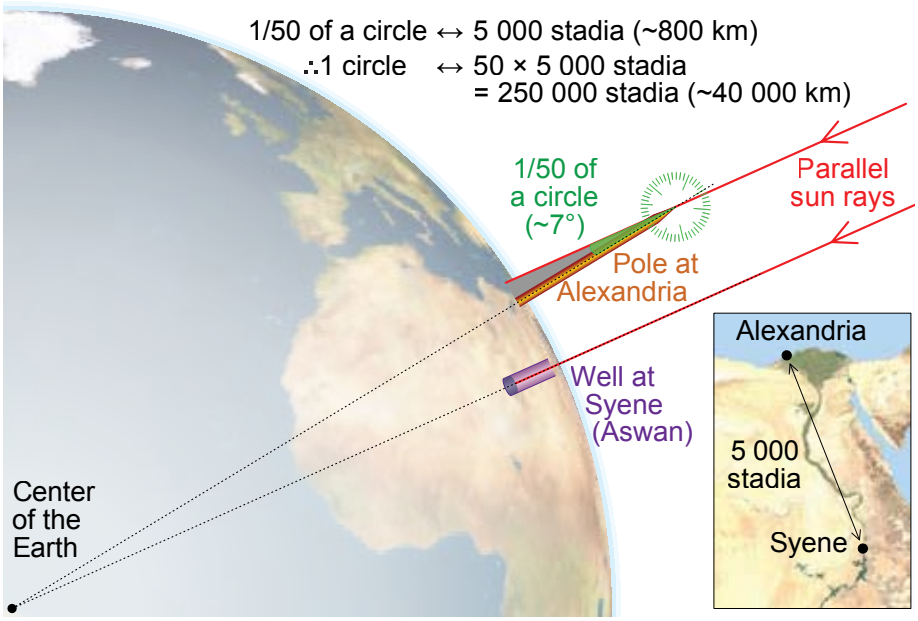

3. Hecataeus' map (reconstruction) (source: Wikicommon)



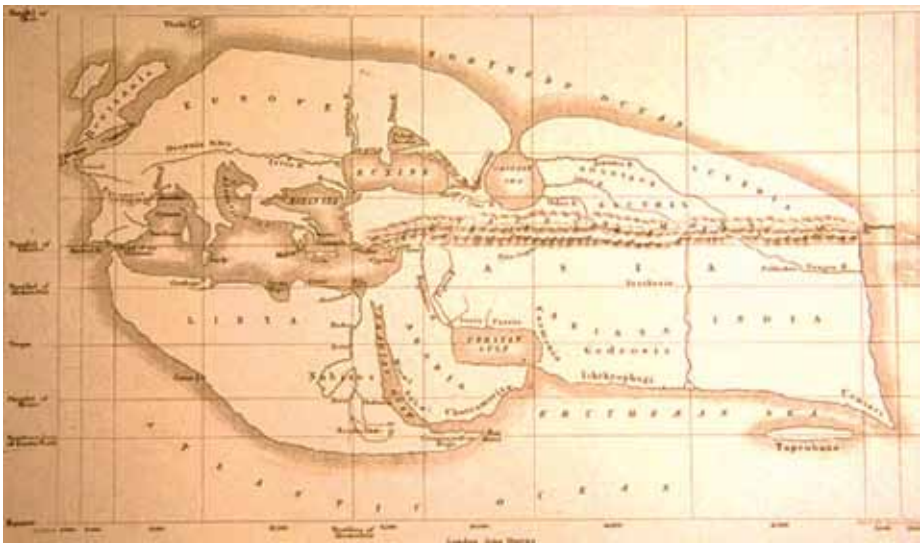
4. Anaximenes' vision of the Earth (reconstruction) (source: Wikicommon)



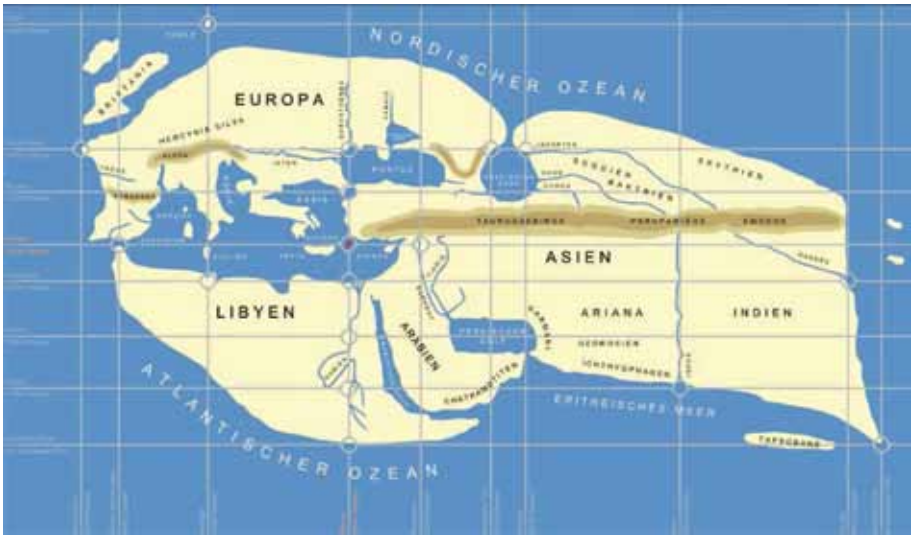

5. Herodotus' world (reconstruction) (source: Wikicommon)



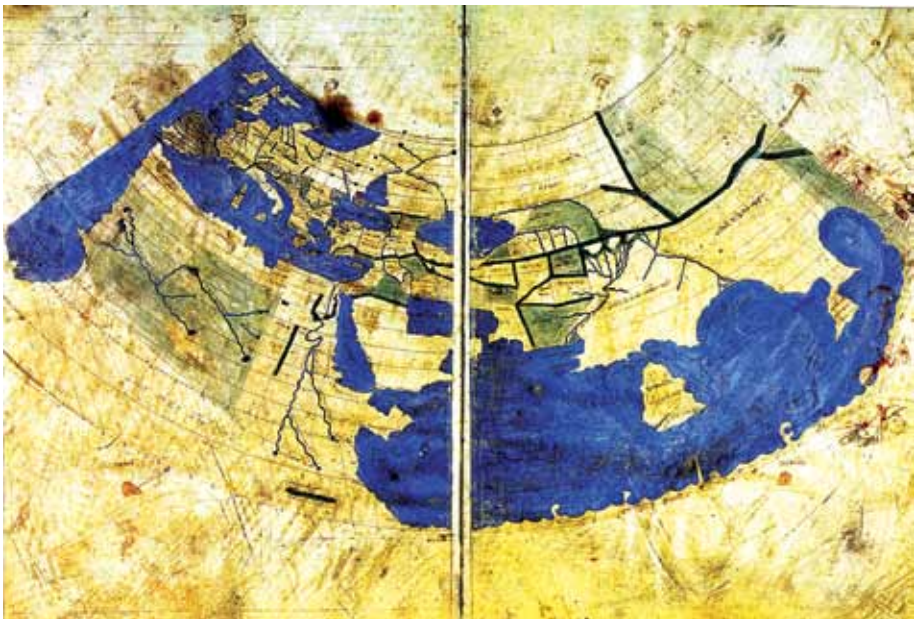

6. Eratosthenes' method to calculate the Earth circumference (source: Wikicommon)



7. Eratosthenes' map (reconstruction 1883) (source: Wikicommon)



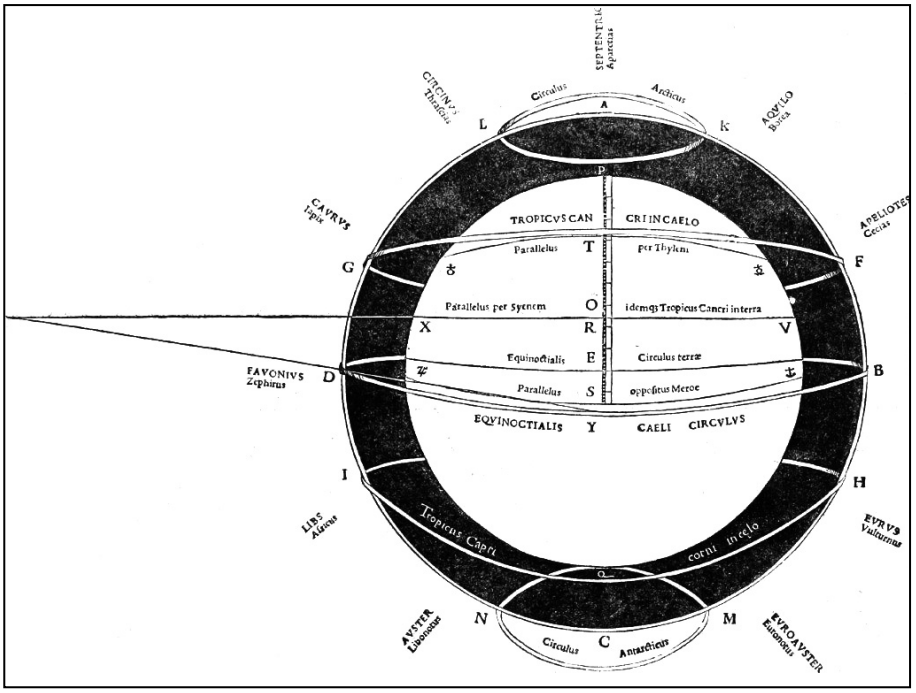

8. Eratosthenes' oikoumene (reconstruction) (source: Wikicommon)



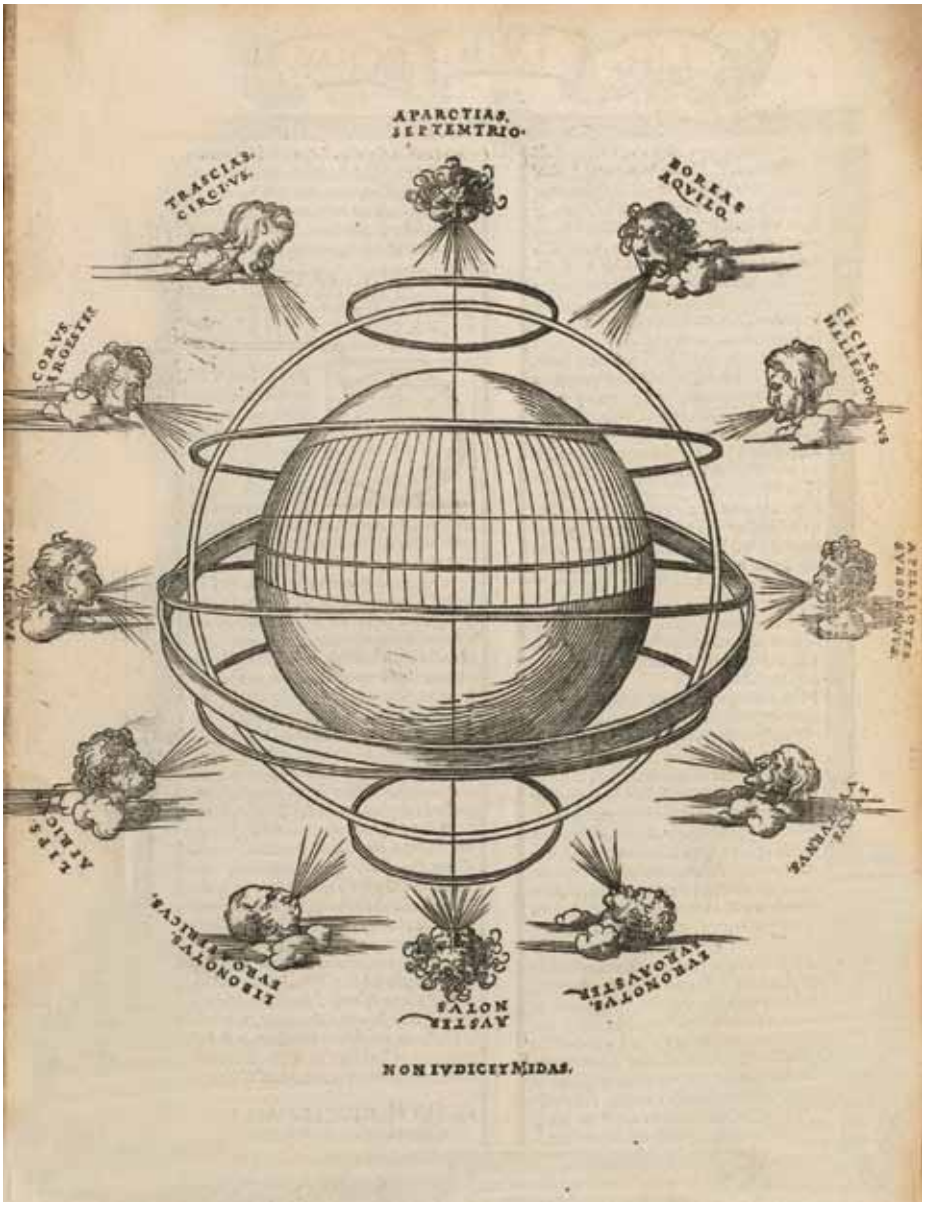
9. Ptolemy's world map (reconstruction in *Vat. Urb. Gr.* 82, ff. 60v-61r ; 13th cent.?) (source: Wikicommon)

10. Ptolemy's world map (reconstruction of the first projection: *Harleian MS* 7182, ff. 58v-59r ; Florence, 15th cent.) (source: Wikicommon)

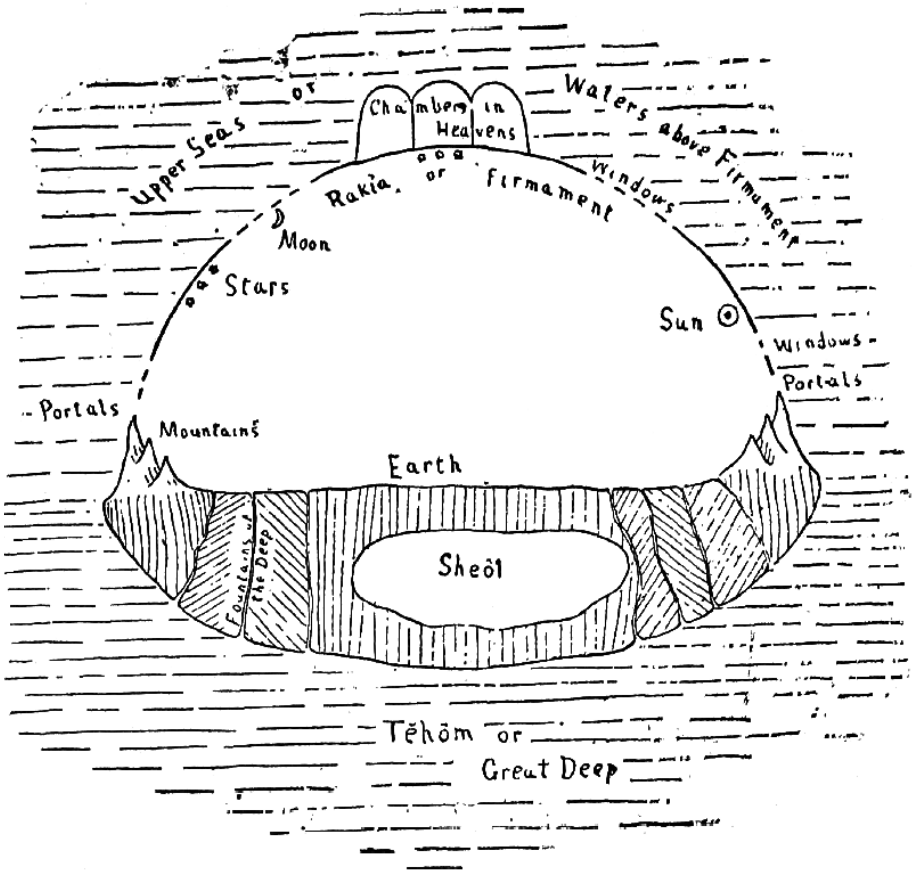
11. Ptolemy's world map (reconstruction of the second projection: Leinhart Holle's edition, 1482) (source: Wikicommon)




12. Ptolemy's world map (reconstruction of the third projection, 1511) (source: Wikicommon)




13. Ptolemy's world map (reconstruction of the third projection, 1525)
(source: Wikicommon)




14. World according to the Hebrew conception (source: Wikicommon)

15. World map from Babylonia (British Museum, 8th cent. BC) (source: Wikicommon)