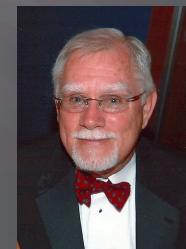


THE EVOLUTION OF THE WORLD MAP

Presented by Jim Siebold
www.myoldmaps.com



The Art of Making Maps

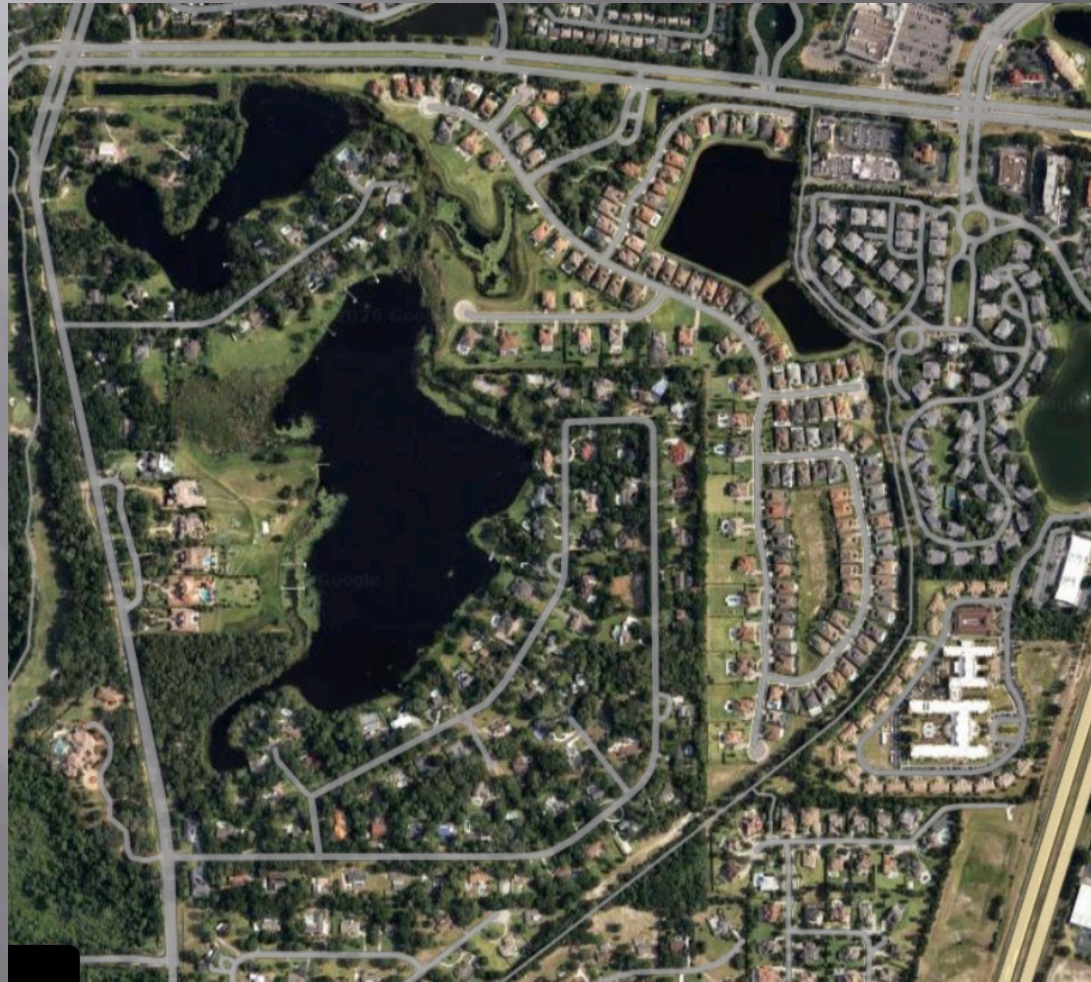
Try drawing a map – from memory – of the WORLD, the state of Florida or even your neighborhood,

No Google, no aerial photography, no satellite imagery, no examples to which to refer

That's what the Ancients faced in their attempts to picture their world

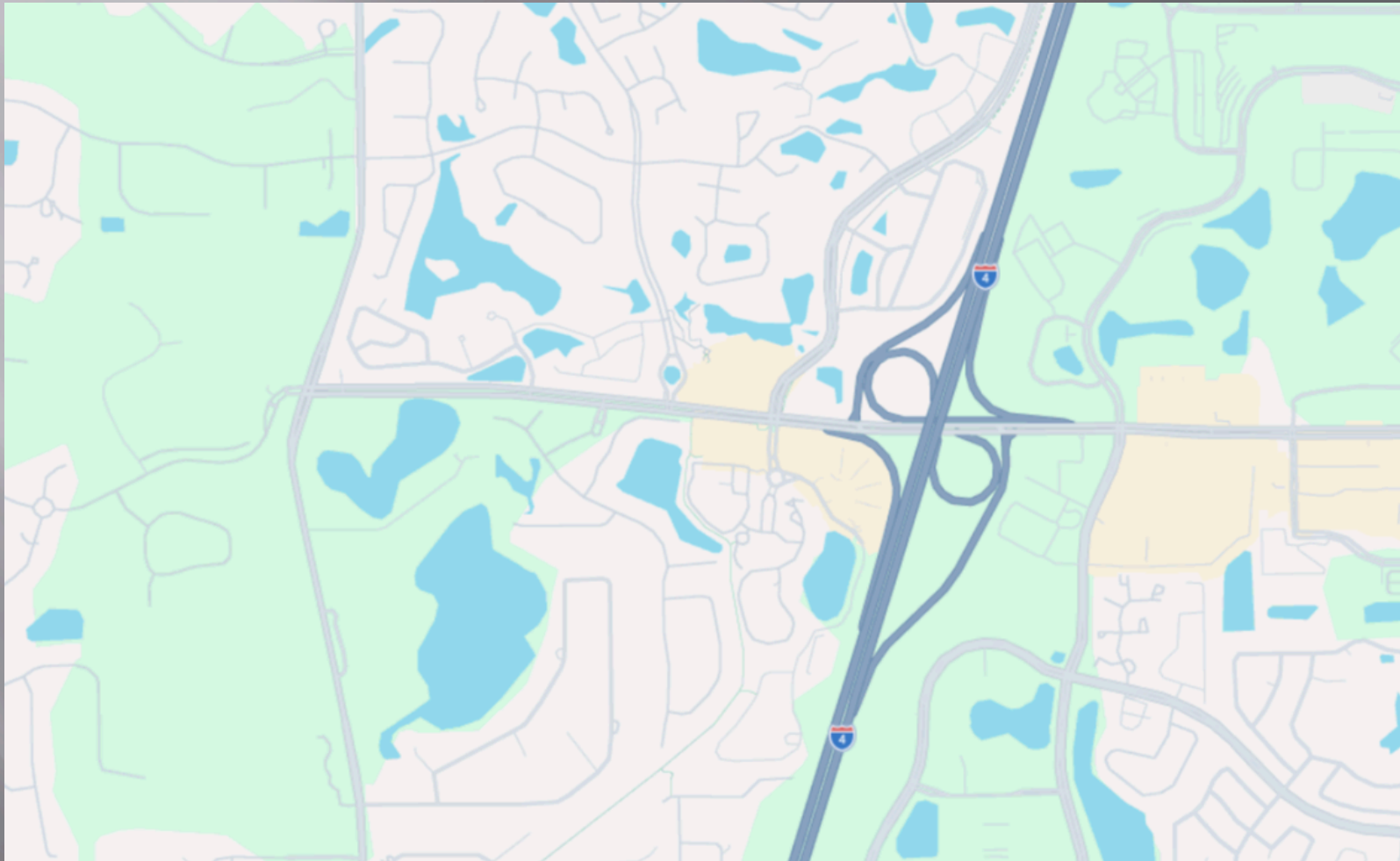
What would you select to include: just the terrain, or possibly coastlines, mountains, hills, rivers, lakes, houses, trees, roads, labels ???

Grand Living at Lake Mary



Even an aerial photograph doesn't help you find your way if you have never been there before

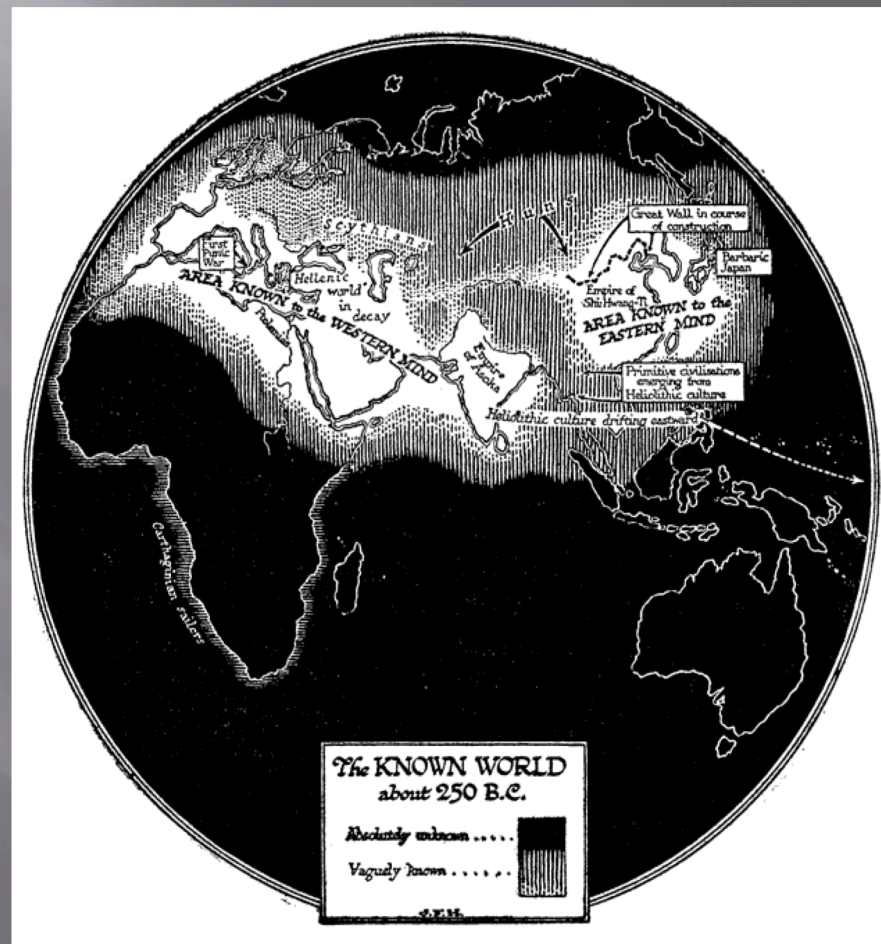
“The map of your home”



What do include? Label all the roads? Include all the stores and businesses?

The First Attempt to Map the World

Who is first recorded as attempting to map their entire known world?



Historical Evidence

- * Modern geography relies on aerial photography (roughly since the First World War), satellite imagery and geographical information systems (GIS), and emphasizes precise quantitative methodology conveyed through maps and statistics. The Babylonians Greeks and Romans relied primarily on sensory impressions and logical argumentation, and occasionally conveyed their understandings in elaborate verbal reports. Their methods and instruments were simple, but this did not prevent them from achieving impressive scientific breakthroughs. The history of ancient geography is thus, in part, a survey of scientific methodologies, showing how elaborate calculations were carried out using primitive tools.
- * The study of geographical concepts and practices in antiquity is important for several reasons. The simplest is the linguistic and toponymic contribution of antiquity to modern terminology: the terms 'Europe', 'Atlantic' and 'climate', for example, all have Greek origins.

The World Map

- * Regardless of the time period, what is the purpose of the world map? It has no practical use for the traveler, for example, since it does not show detail of any part of the world. One could not sail the Mediterranean or explore the Florida with a world map. It is no use even to the cartographer as detailed maps of all the regions of the world precede and underlie the world map itself. The world map is essentially the answer to an intellectual problem. It allows us to locate ourselves in space as the calendar does in time. The need to inhabit an ordered space creates the impulse to represent the entire world in a manageable form. The world map is thus a conceptual model that satisfies the mind and underlies other knowledge.

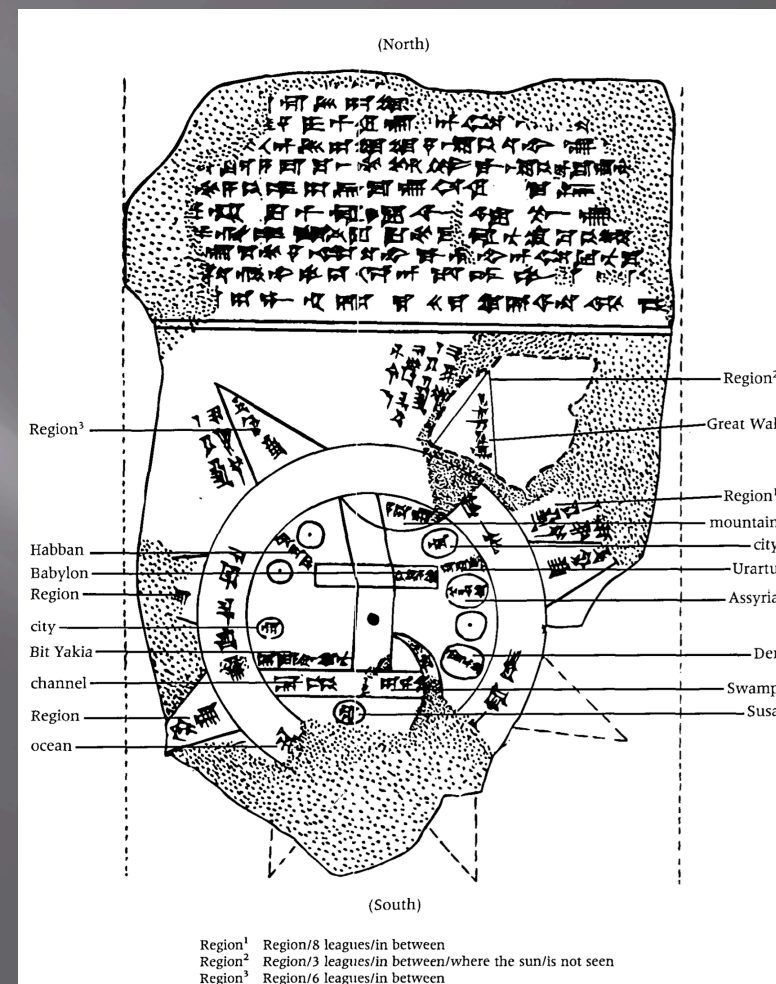
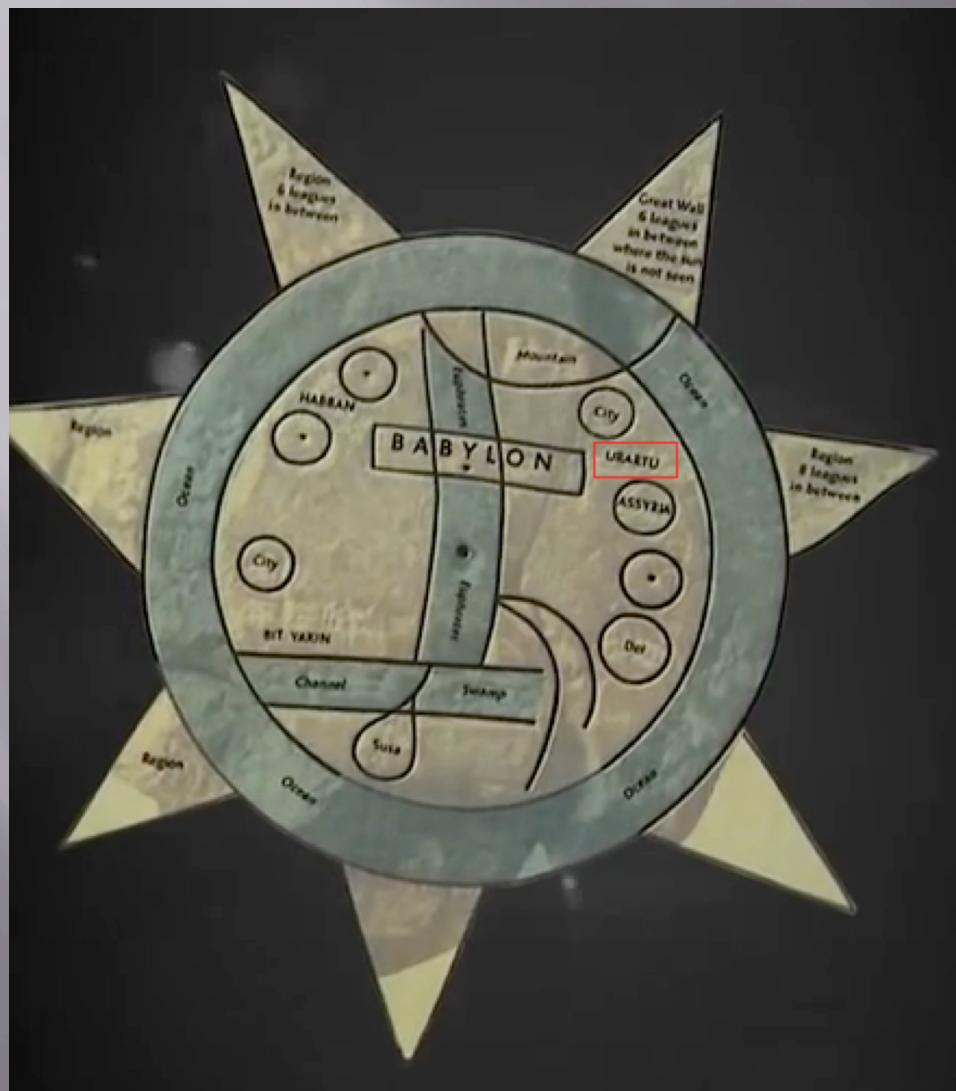
The World Map

- * The world map is thus a conceptual model that satisfies the mind and underlies other knowledge. As the mind hovers over the world map it is satisfying some deep desire to survey the world and to travel across it at will. The makers of world maps through the ages have had the same desire; some knew that the earth is a sphere but in addition to making model globes they persisted in drawing the world on vellum or paper in two dimensions. Why? Partly for practical reasons: a flat map is more practical than a globe in many situations. But there is also a deeper reason. The globe conceals half the world and in order to locate ourselves, and in the quest for a complete perspective on the world, we must see all the world spread out before us.

Babylonian World Map, 600-500 BCE (#103)

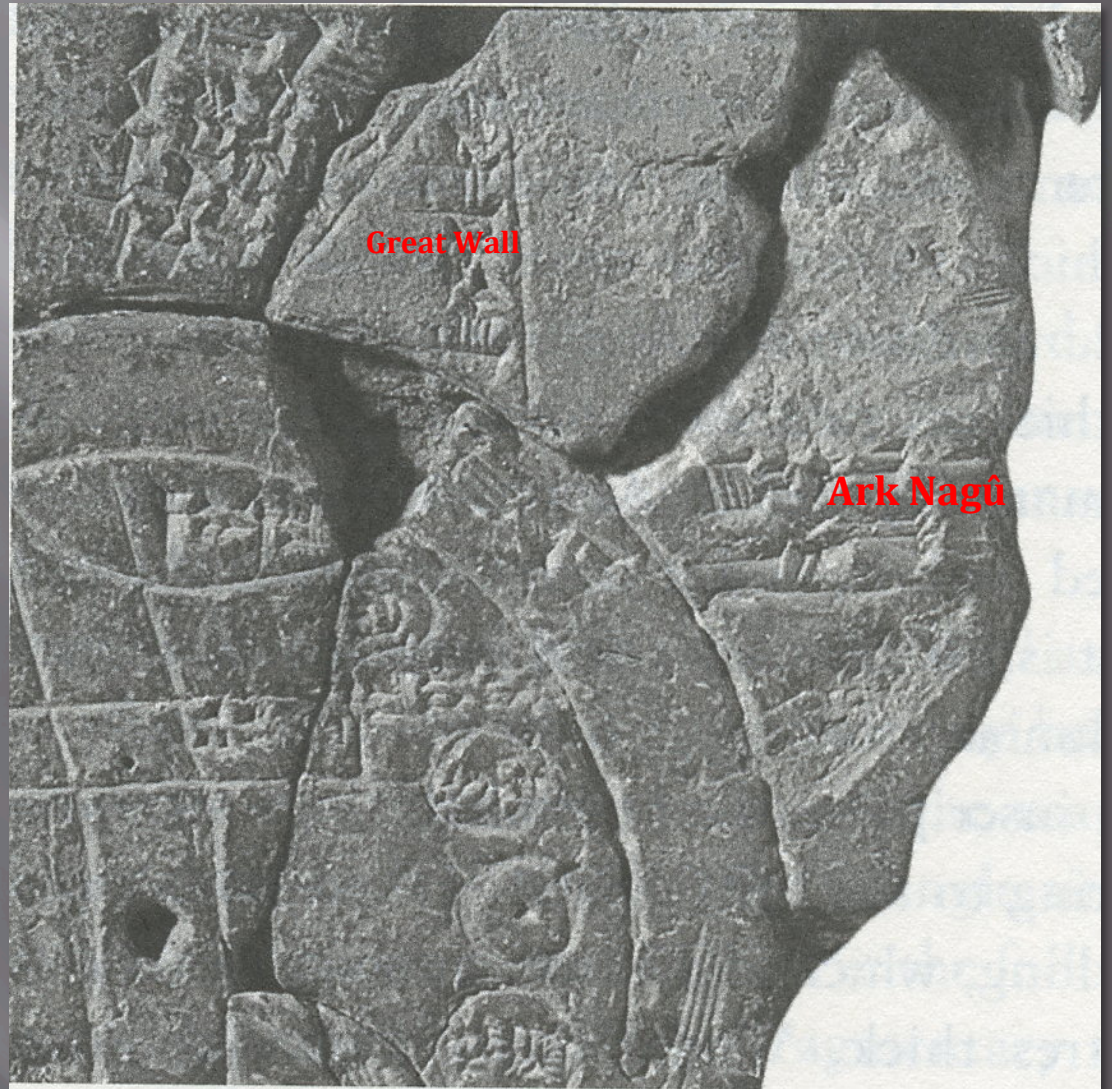
This is the oldest known world map. It depicts the known world from far above as a disc surrounded by a ring of water called *marratu* in Akkadian. Two concentric circles were drawn in with some cuneiform precursor of a pair of compasses whose point was actually inserted south of Babylon, perhaps at the city of Nippur, the '*Bond of Heaven and Earth*'. Within the circle the heartland of Mesopotamia is depicted in schematic form. The broad Euphrates River runs from top to bottom, originating in the northern mountainous areas and losing itself in canals and marshes in the south.





Babylonian World Map, 600-500 BCE

- ▣ Close-up of Babylonian Map of the World, front view, showing Urartu, the Ocean, the Great Wall of China and *Nagû IV*, the original home of Noah's Ark
- ▣ The written and illustrated tradition of the *Babylonian Map of the World* is the oldest information we have; it encapsulates old Babylonian ideas of the early second millennium BCE which are a thousand years older than the tablet on which it is preserved. According to this the Ark came to rest on a very remote, gigantic mountain, located far beyond *Urartu* on the other side of the world-encircling Ocean, far indeed beyond the knowledge of man.



Initial Considerations

- * Ancient Greek thinkers addressed the three most fundamental questions of geography:
 - * *What is the form and magnitude of the earth?*
 - * *What are the shape and size of its landmasses and oceans?*
 - * *What is the nature and extent of human habitation on the earth?*
- * There is considerable fragmentary evidence that many ancient civilizations had regarded 'The World' as synonymous with 'Our World'. Egyptians, Babylonians, Indians and Chinese have all left 'World Maps' which are essentially maps of their own territory, surrounded by ocean. This was a natural concept, and the same thought is traceable in a number of ancient texts, such as the Homeric poems. These peoples plainly did not possess a world map – literally, mentally or psychologically in which certain blank spaces were waiting to be filled; rather, what they knew filled the whole world. It was the achievement of certain Greek thinkers to break free from such subjective intuitions and to raise geography to the level of objective science.

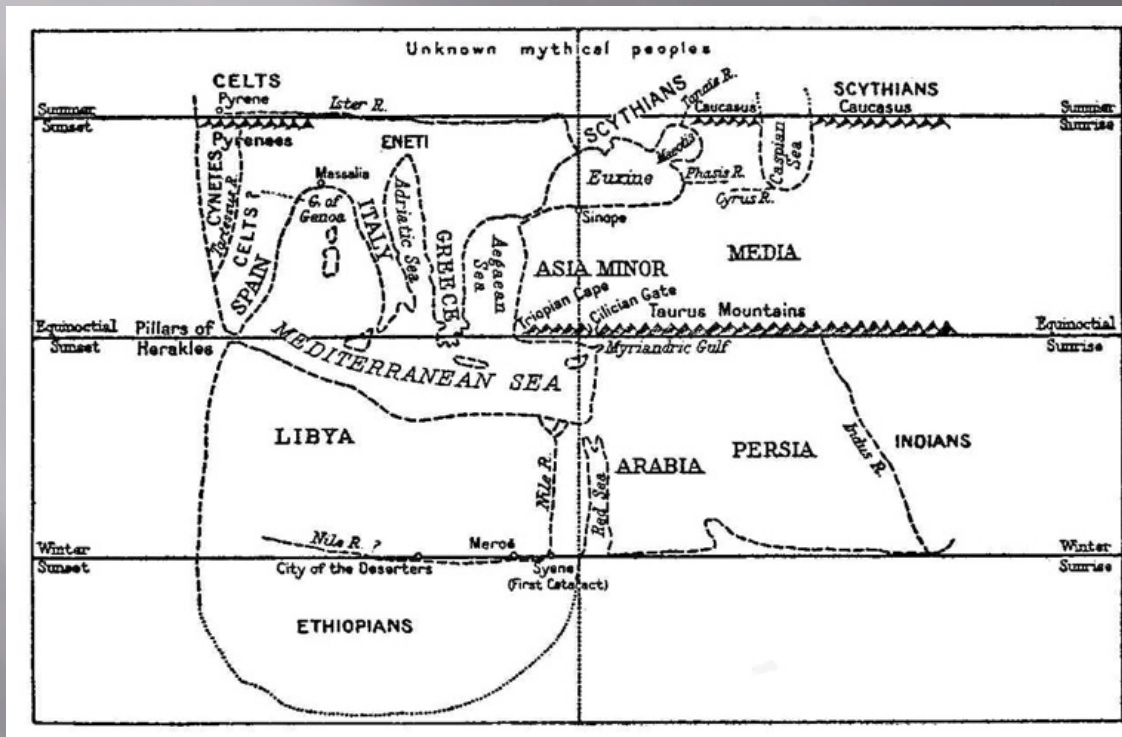
The Greeks

The Milesian philosophers of the 5th and 4th centuries BCE - Thales, Anaximander and Hecataeus - were convinced that the earth was a sphere, and they are reported to be the first to have made globes and maps of the world.

Spherical geometry and coordinate systems were first used by astronomers in relation to the heavenly sphere, and their subsequent transfer to terrestrial geography enabled estimates to be made of the size of the earth. The most famous of these, by Eratosthenes of Cyrene in the 3rd century BCE, was accurate to within 5% of its true value.

The inescapable conclusion of such theoretical work was that the known, inhabited world - the Mediterranean and western Asia - represented only one small part of the globe; there remained vast areas of the world that were unknown and out of reach, and where other men and other civilizations might possibly exist.

Ancient Greek World View

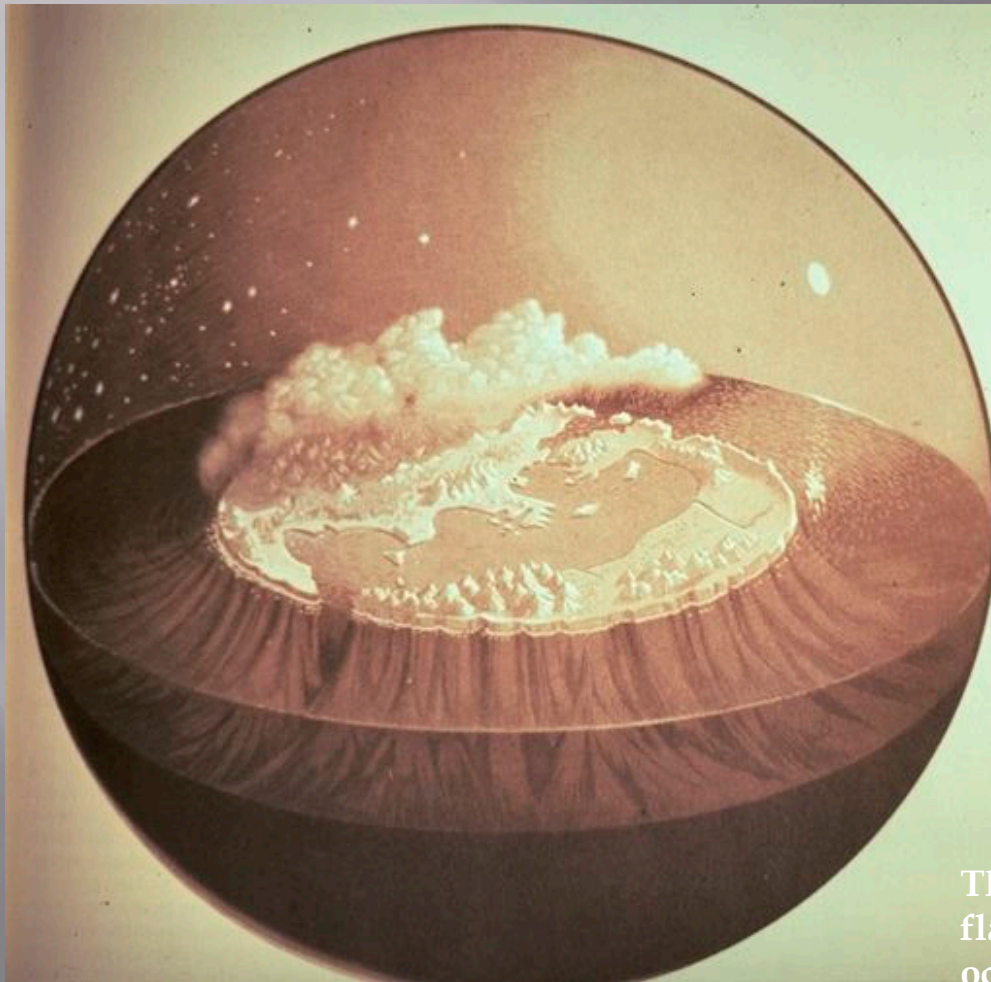


To the Greeks, maps were never primarily intended just to show precise spatial relationships between places.

Early Greek maps, in particular, had no practical application, but they stimulated the imagination and enriched Greek ideas about humans' relationship to the natural world; they also reflected the Greek zest for adventure and exploration

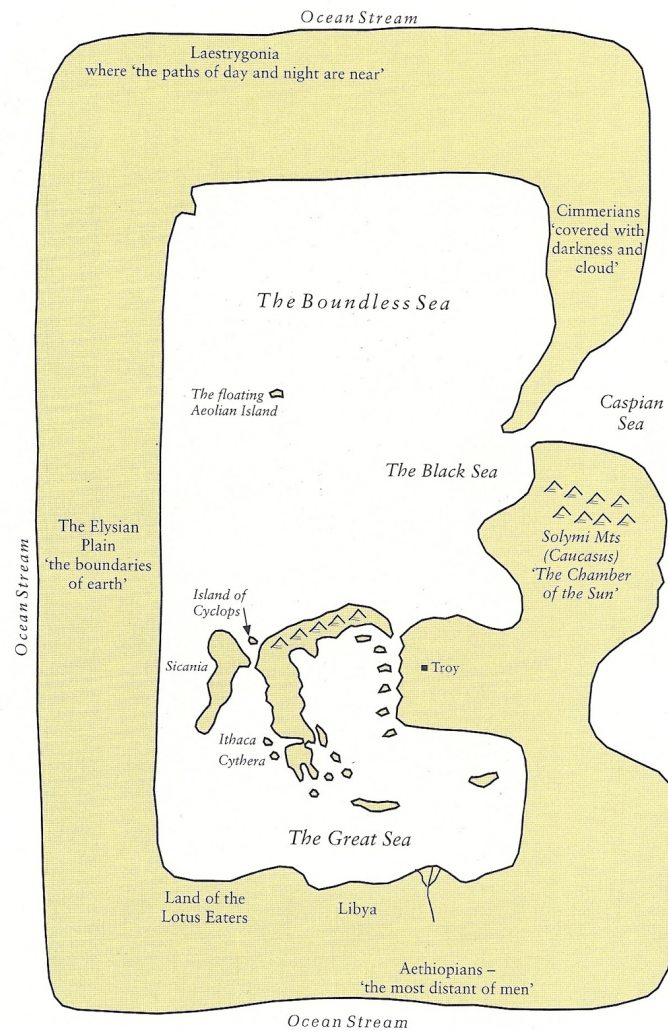
A reconstruction by Heidel of the conceptual frame of the Greeks' view of the *oikumene* [inhabited world]. This sketch map illustrates the probable Greek concept of the general relationships of the *oikumene* to the frame at the time of Eratosthenes, and embodying a Persian map at the time of Darius. This is not strictly a reconstruction, since no definite information is available with regards either to the manner in which details of the coastlines appeared on the Greek maps, or to the relative distances separating the various features indicated.

Reconstructions of Homer's World View, ~900 BCE (#105)



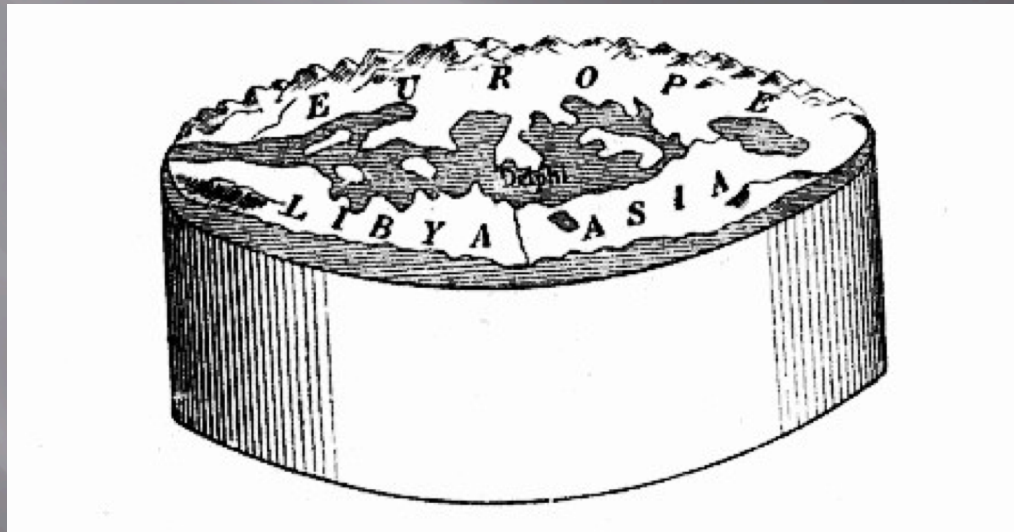
The Homeric conception of the world represented as a flat, circular disc of land surrounded by a continuous ocean-stream remained a popular notion in the Greek world even after many philosophers and scientists had accepted the theory of the sphericity

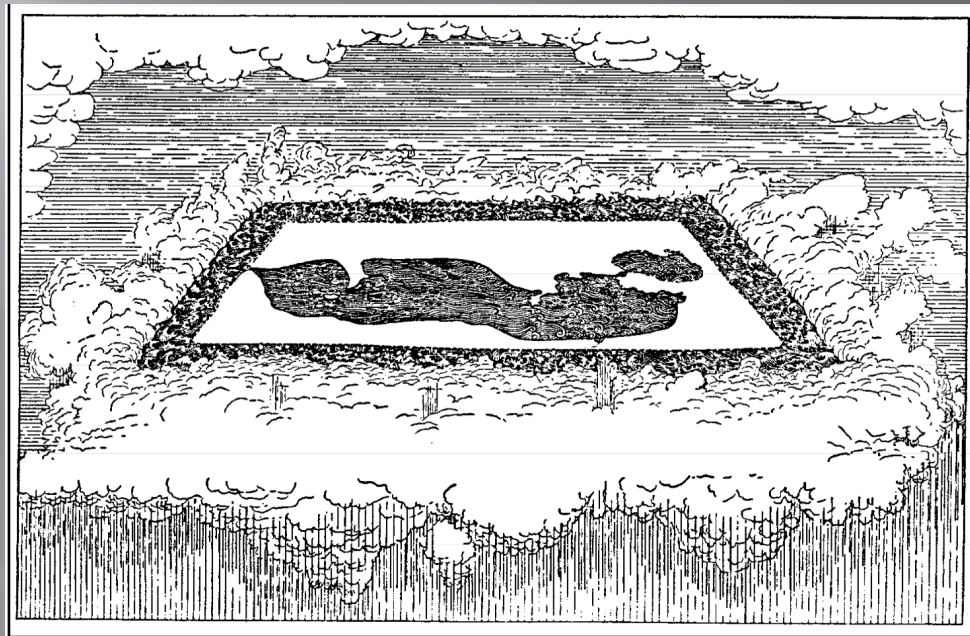
Homer's World View (#105)



The Homeric World: a conjectural reconstruction taken from geographical references in the 'Iliad' and the 'Odyssey'. Sometimes distances were indicated by sailing times, e.g. a north wind drove the Greeks for ten days from Cythera to the land of the Lotus Eaters.

Both the Greek historians/ geographers Strabo and Agathemerus 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. (#107)

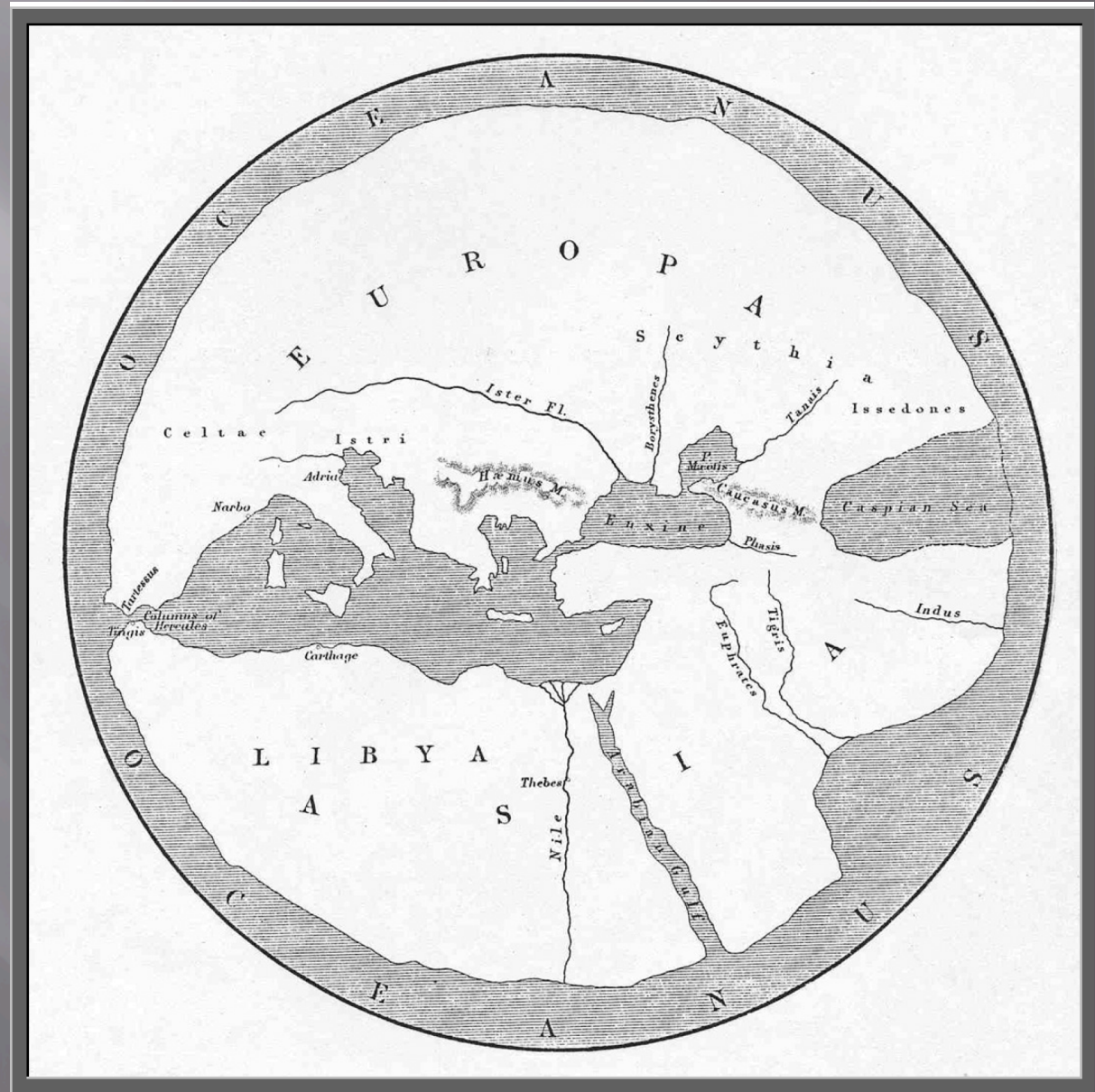




*The rectangular world of Anaximenes ca. 500 BCE,
(see #107) was watery yet supported in space by
compressed air. The Mediterranean washed its
nearer shores while beyond the horizon flowed the
great circumfluent Ocean Sea. (#107)*

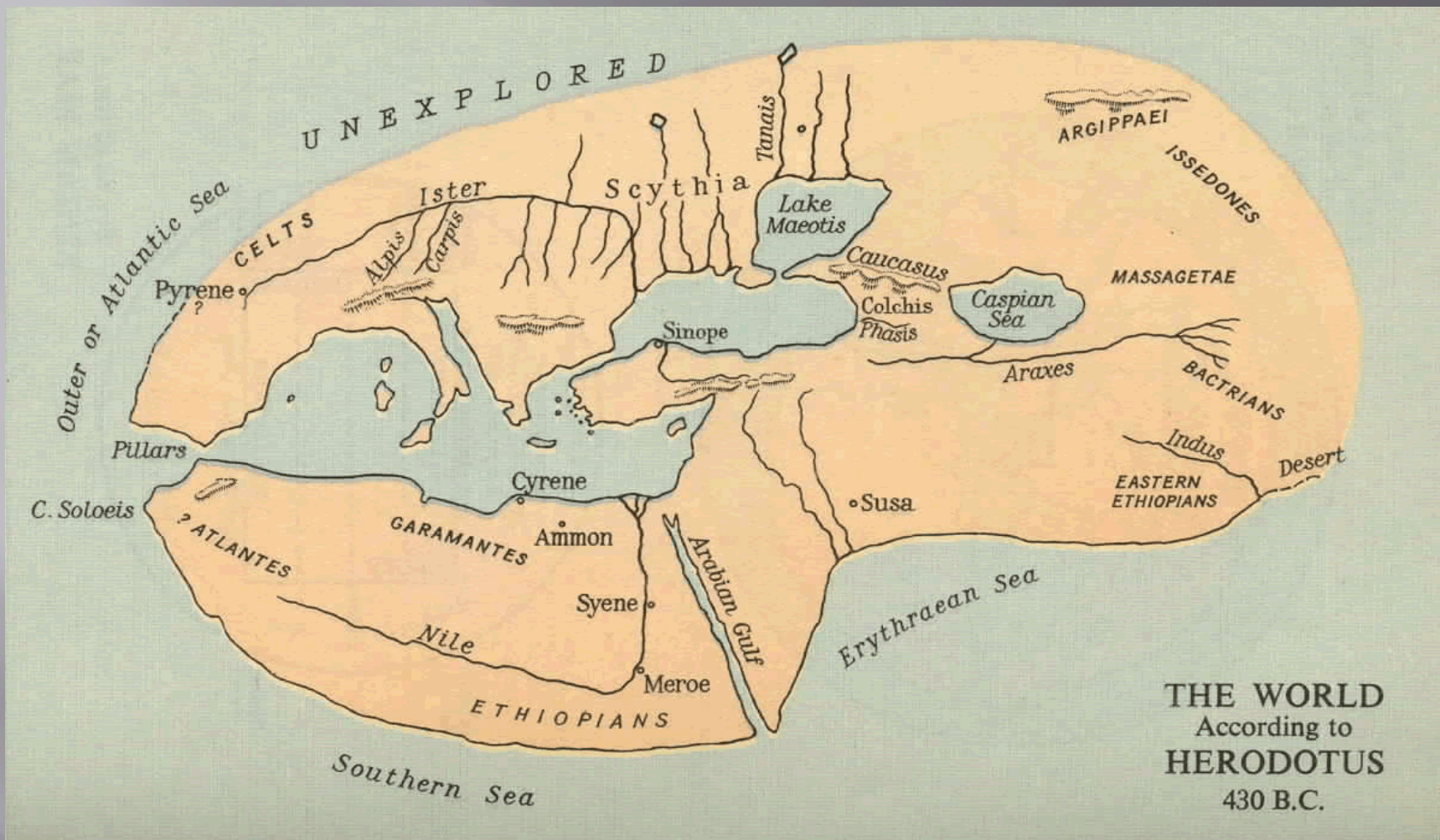
A Reconstruction of Hecataeus' World Map 550-480 BCE (#108)





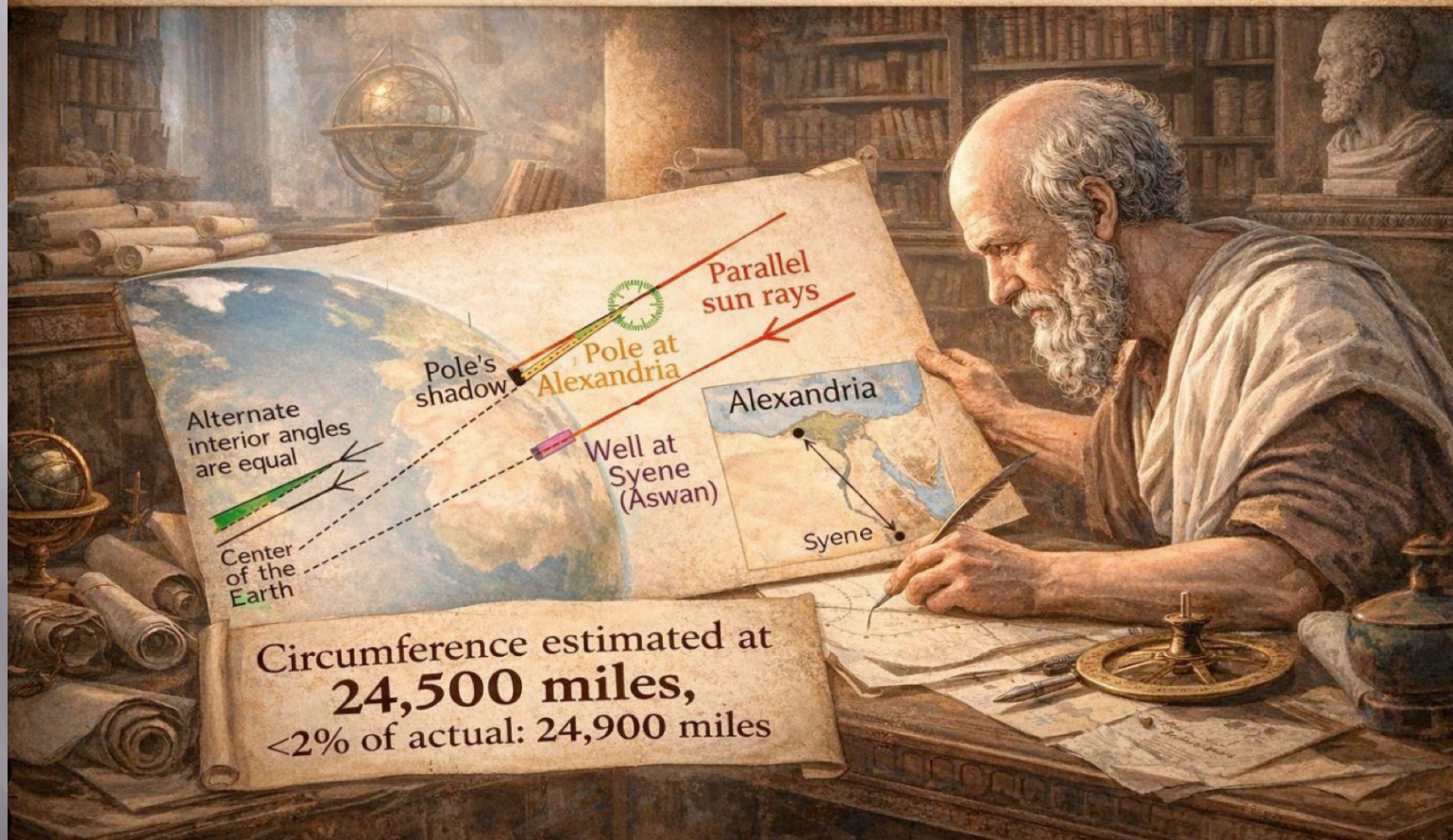


19th century reconstruction of
Herodotus' World map of 430 BCE
(#109)

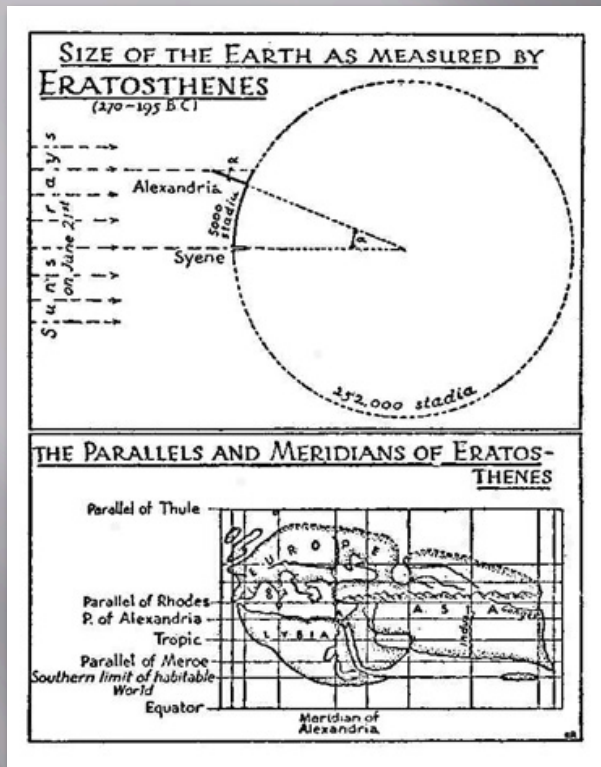


Another reconstruction of
Herodotus' World map of 430 BCE
(#109)

The Circumference of the Earth, by Eratosthenes, 3rd Century BCE

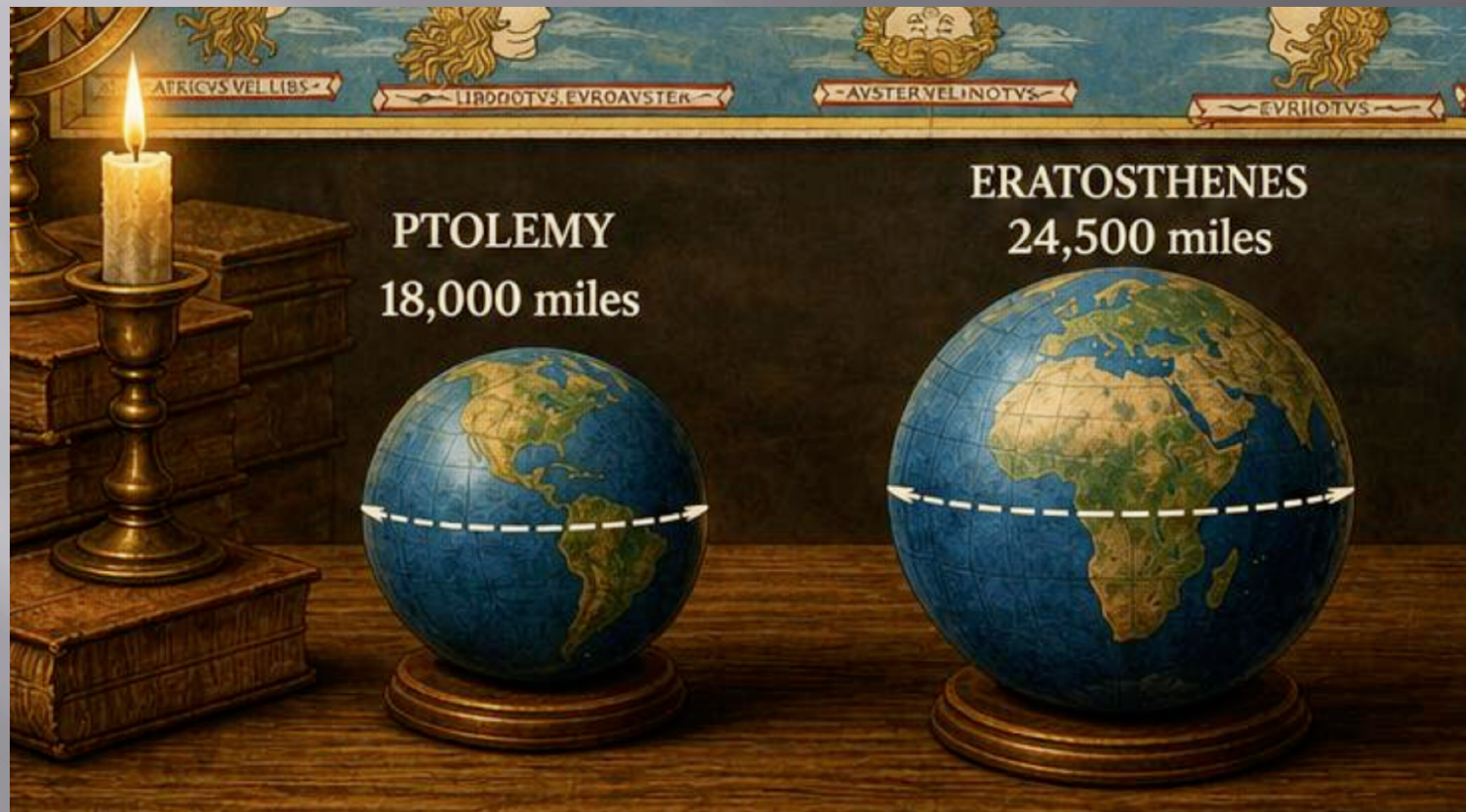


Measuring the size of the World



The only theoretical error in this mode of calculation was in the assumption - which was inevitable in the days of Eratosthenes - that the earth was exactly spherical, instead of being as it really is, a slightly oblate spheroid, and that therefore a meridian great circle was equal to that of the equator. And the error proceeding from this cause, which would not exceed $1/300^{\text{th}}$ part of the whole, is wholly unimportant as compared with the practical errors arising from the defective means of observation.

252,000 *stades*. A conversion to modern units of measure finds Eratosthenes' calculation to be somewhere between 45,007 km (27,967 miles) to 39,690 km (24,663 miles), as compared to actual equatorial circumference of 40,075 km (24,902 miles), there has always been some controversy over the equivalent modern length of a *stade* as used by Eratosthenes.



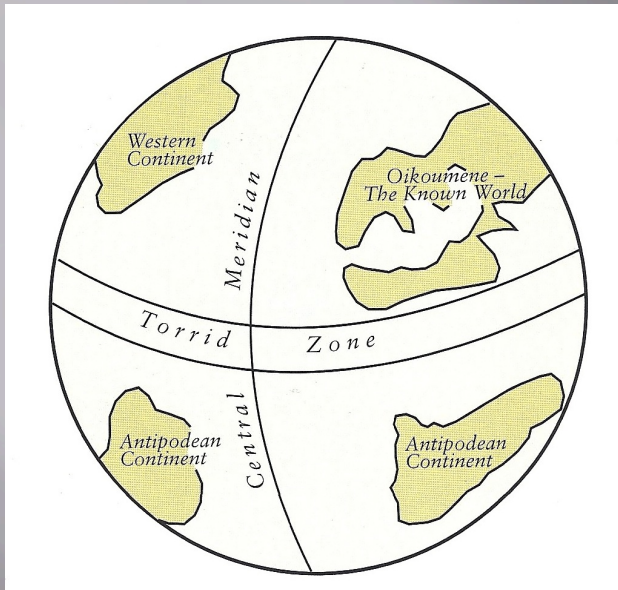
The significance of this discrepancy is that Columbus assumed that Ptolemy's measurement was accurate

Crates of Mallos , 180-156 BCE #113

- * Crates made the first attempt to construct a terrestrial globe
- * It was Crates' idea that the earth's surface, when represented on a sphere, should appear as divided into four island-like habitable regions. On the one hemisphere, which is formed by a meridional plane cutting the sphere, lies our own *oikoumene*, or known habitable world, and that of the *Antoeci* in corresponding longitude and in opposite latitude; on the other hemisphere lies the *oikoumene* of the *Perioeci* in our latitude and in opposite longitude, and that of the *Antipodes* in latitude and longitude opposite to us.

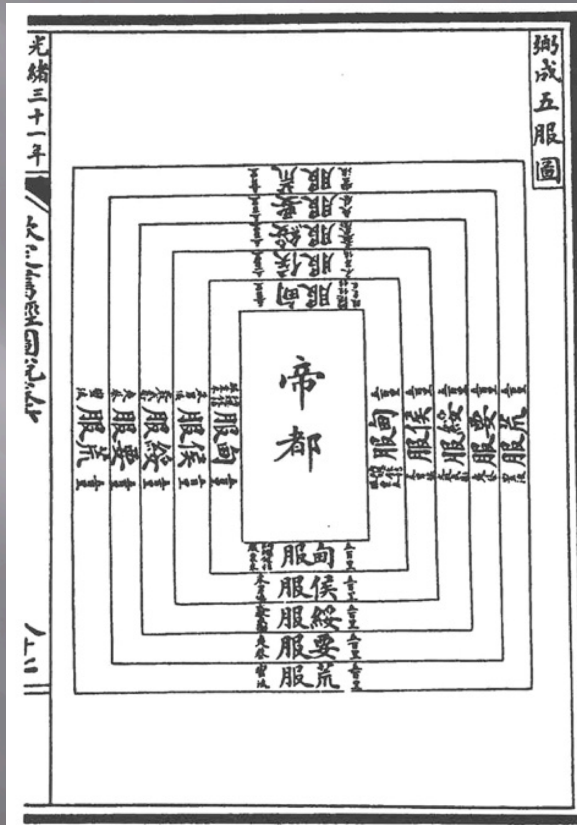


Crates' Globe #113



New entry in Archimedes museum in Olympia Greece. Archaeologists reconstructed Crates of Mallus (2 BCE) earth globe according to Eratosthenes measurements





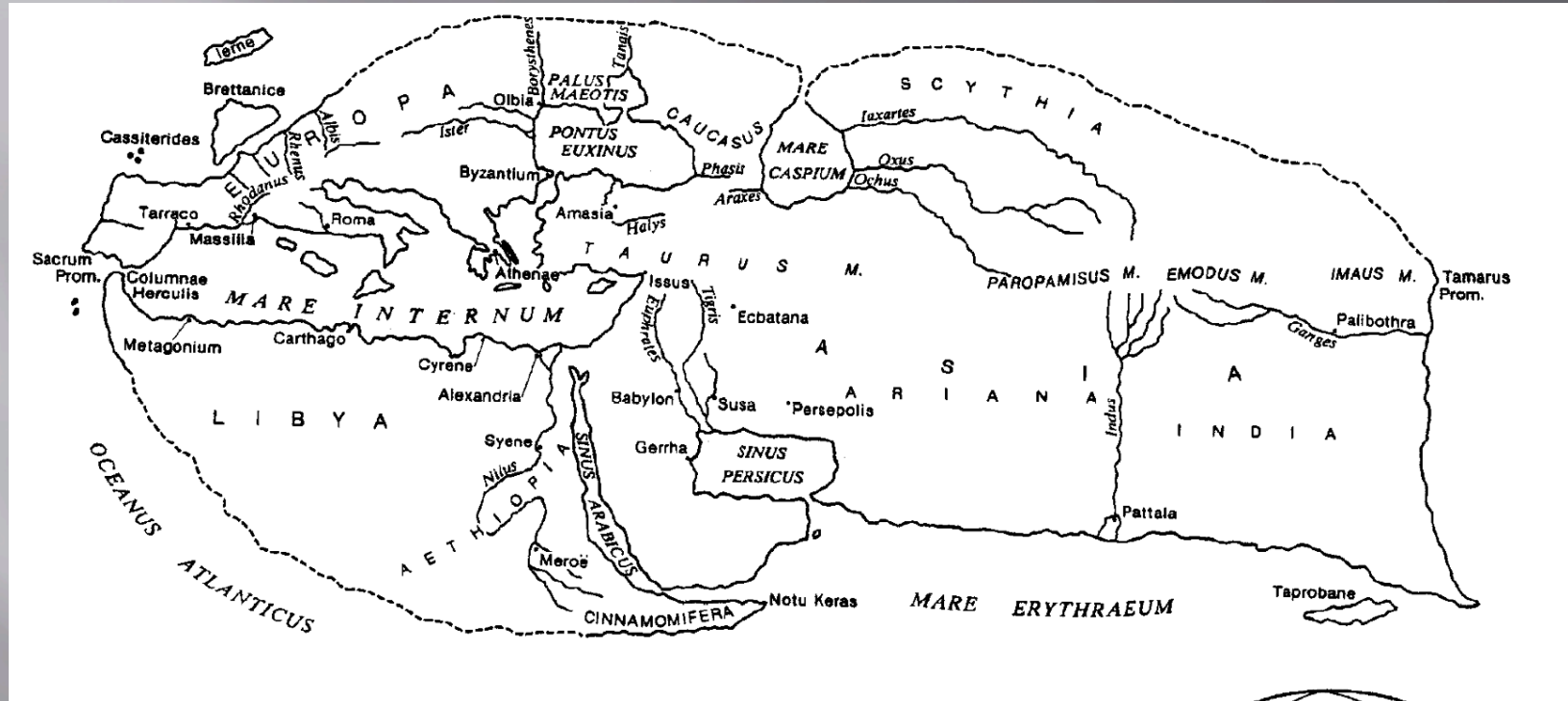
Ancient Chinese World View, 138 BCE

From the *Chhin-Ting Shu Ching T'u Shuo*

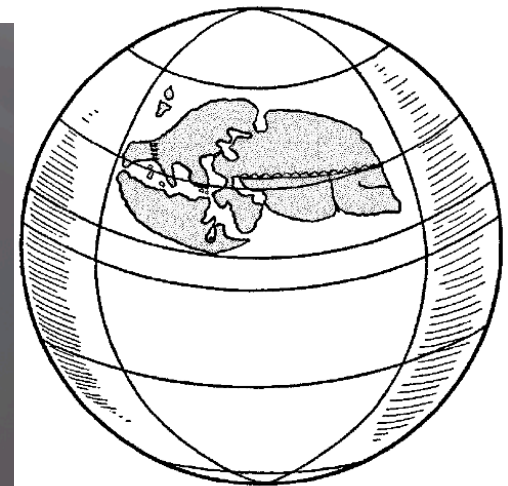
[imperial illustrated edition of the *Historical Classic* chapter 6, Yü Kung]

The traditional conception of the radiation of ancient Chinese culture from its imperial center. Proceeding outwards from the metropolitan area we have, in concentric rectangles, (a) the royal domains; (b) the lands of the tributary feudal princes and lords; (c) the 'zone of pacification', i.e. the marches where Chinese civilization was in course of adoption, (d) the zone of allied barbarians; (e) the zone of cultureless savagery. The systemization can never have been more than schematic but Egypt and Rome might have used a similar image, all unconscious of the equally civilized empire at the eastern end of the Old World.

Strabo's World View 18 CE #115



Strabo's world is smaller than that described by Eratosthenes, his predecessor by two centuries. The earth's width is reduced to 30,000 *stades* (compared with Eratosthenes' 38,000), while its length is 70,000 *stades* compared to Eratosthenes' 78,000. Or that at least is his inhabited world, which Strabo describes as 'an island' floating in a sea in the northern hemisphere. He believed that the world he knew and described took up about a quarter of the earth.



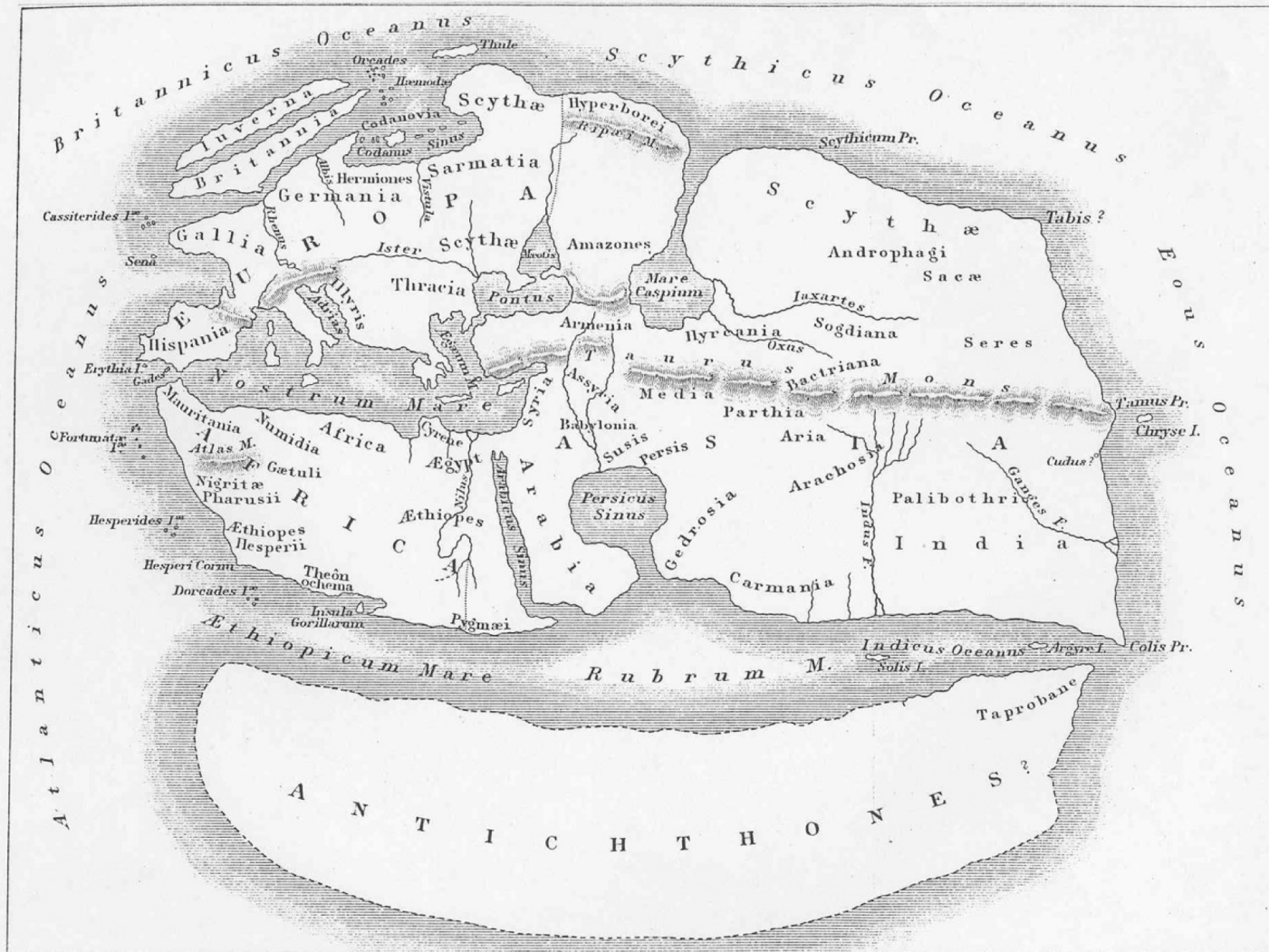
Marcus Vipsanius Agrippa 20 CE #118



A "reconstruction" of Agrippa's Map. Note that most scholars, however, believe that due to its placement on the column in a portico or stoa open to the public, the Porticus Vipsani, it was probably rectangular, not circular.

Pomponius Mela's World Map 37 CE #116

the earliest Roman geographer



Mela departs from the traditional ancient concept by asserting that in the southern temperate zone dwelt inhabitants who were inaccessible to Europeans because of the *Torrid Zone* that intervened. His knowledge of the characters of Western Europe and the British Isles was clearer than that of the Greek writers, and he was the first to name the *Orcades* [Orkney Islands]. The great Roman historian Pliny quoted Mela as an authority.

Claudius Ptolemy, 150 CE #119

The Geography, by Ptolemy, 2nd Century CE

PTOLEMY
18,000 miles

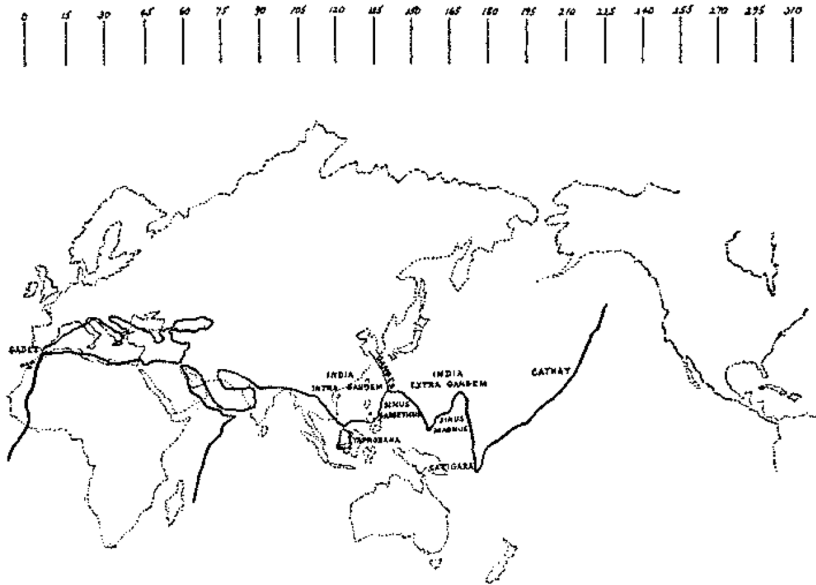
ERATOSTHENES
24,500 miles

Subject:	Geography
What He Got Right:	• Systematic geography • Use of latitude and longitude • 8,000 actual places
What He Got Wrong:	• Underestimated Earth's size

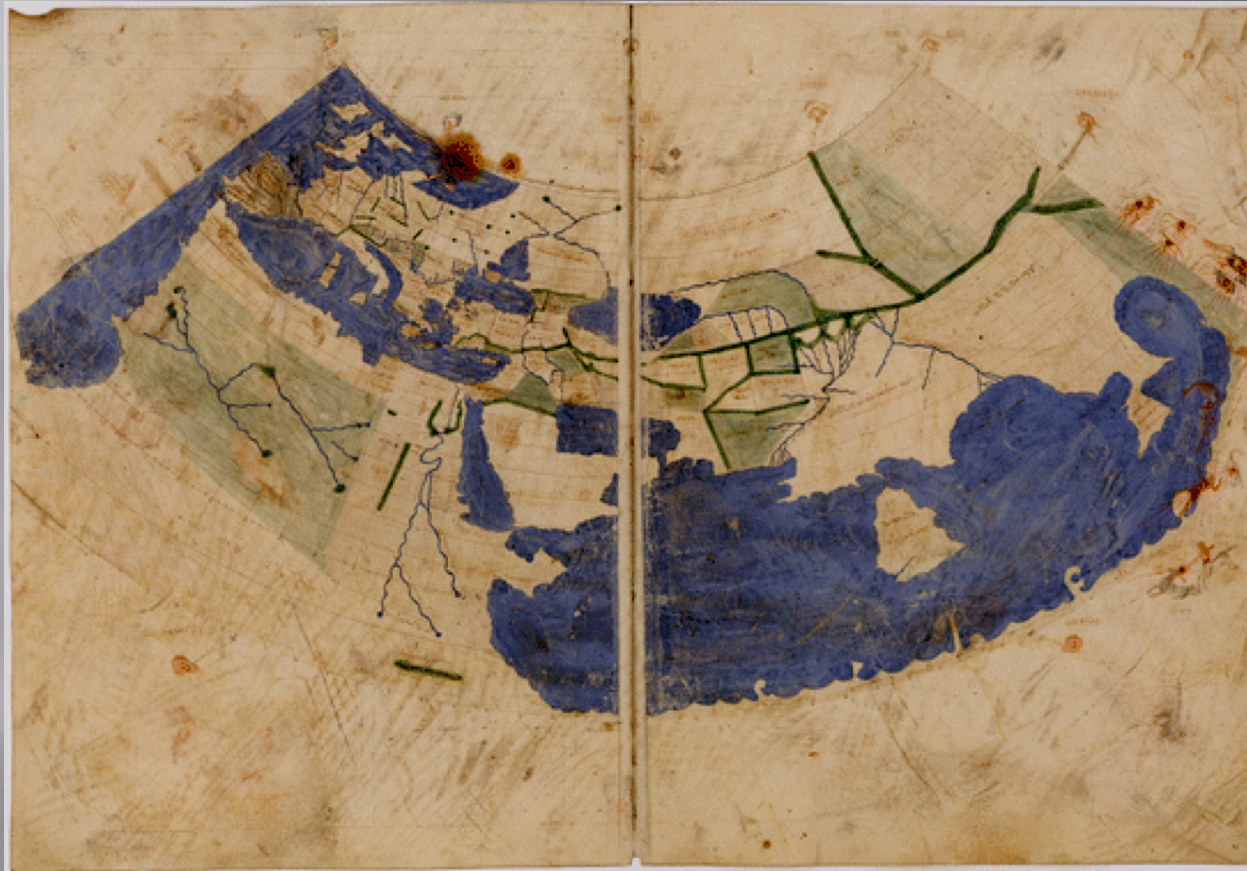


The area covered by Ptolemy's world map superimposed on an outline of a modern map. While Ptolemy's map is based upon the theory that the earth is round, it bares repeating that it is to his credit that he depicts only that half of its surface which was then known, with very little attempt to speculate on or "fill-in" the unknown parts with his imagination.

Ptolemy's eastward extension of Asia, reducing the length of the unknown part of the world, coupled with his estimate of the circumference of the earth, was his greatest contribution to history if not cartography. The earth was only 18,000 miles around at the equator; Poseidonius had stated it, Strabo substantiated it, and Ptolemy perpetuated it on his maps. This "shorter distance" that a mariner would have to travel west from the shores of Spain in order to reach the rich trading centers of Asia may have contributed to Columbus' belief

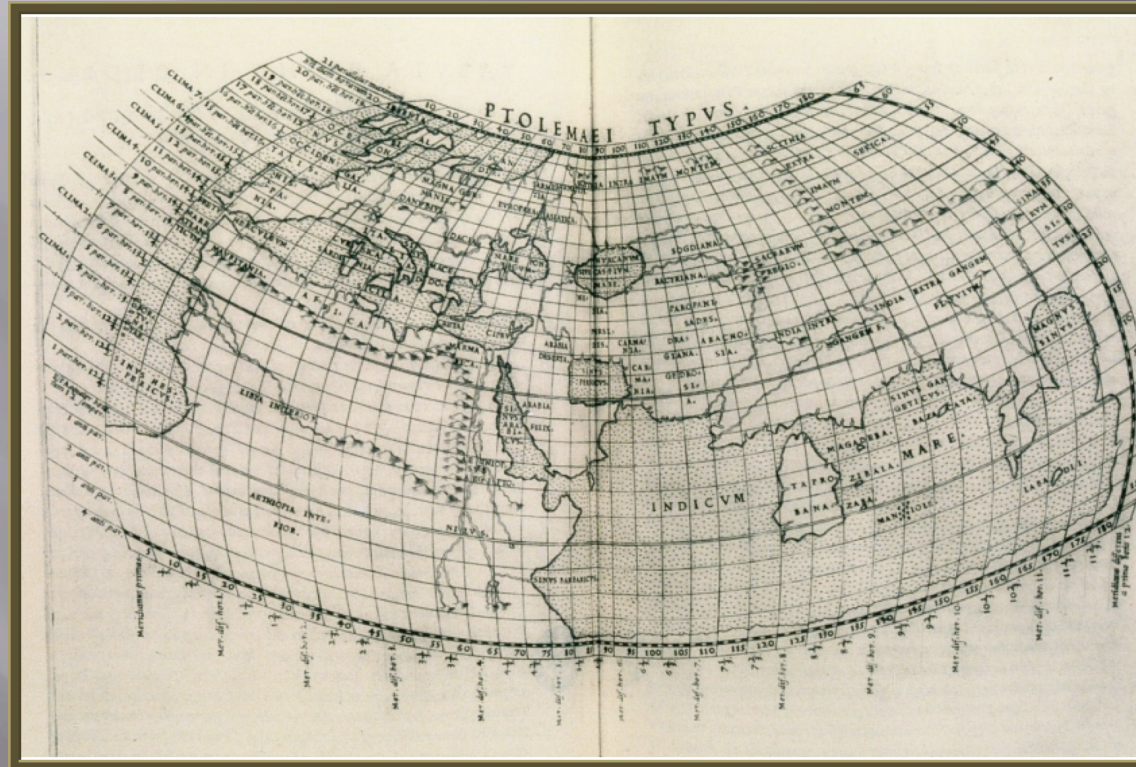


Ptolemy's Conic Projection



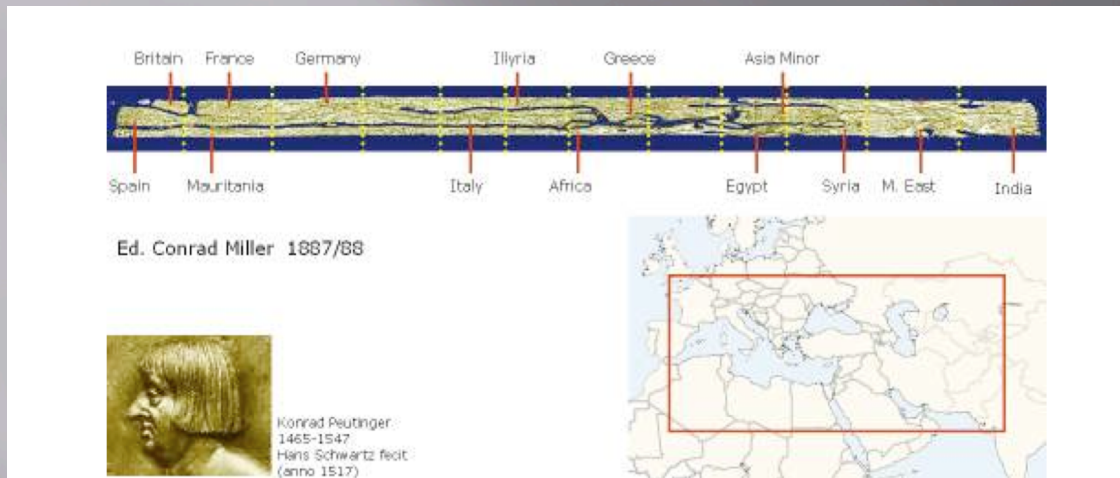
*Ptolemaic world map using a conical projection
A Byzantine Greek world map according to
Ptolemy's first (conic) projection. From Codex
Vaticanus Urbinas Graecus 82, Constantinople c.
1300. Probably assembled by Maximus Planoudes*

Ptolemy's 2nd Projection



A reconstruction of a map on grid system, in Ptolemy, La geographia, 1561-64

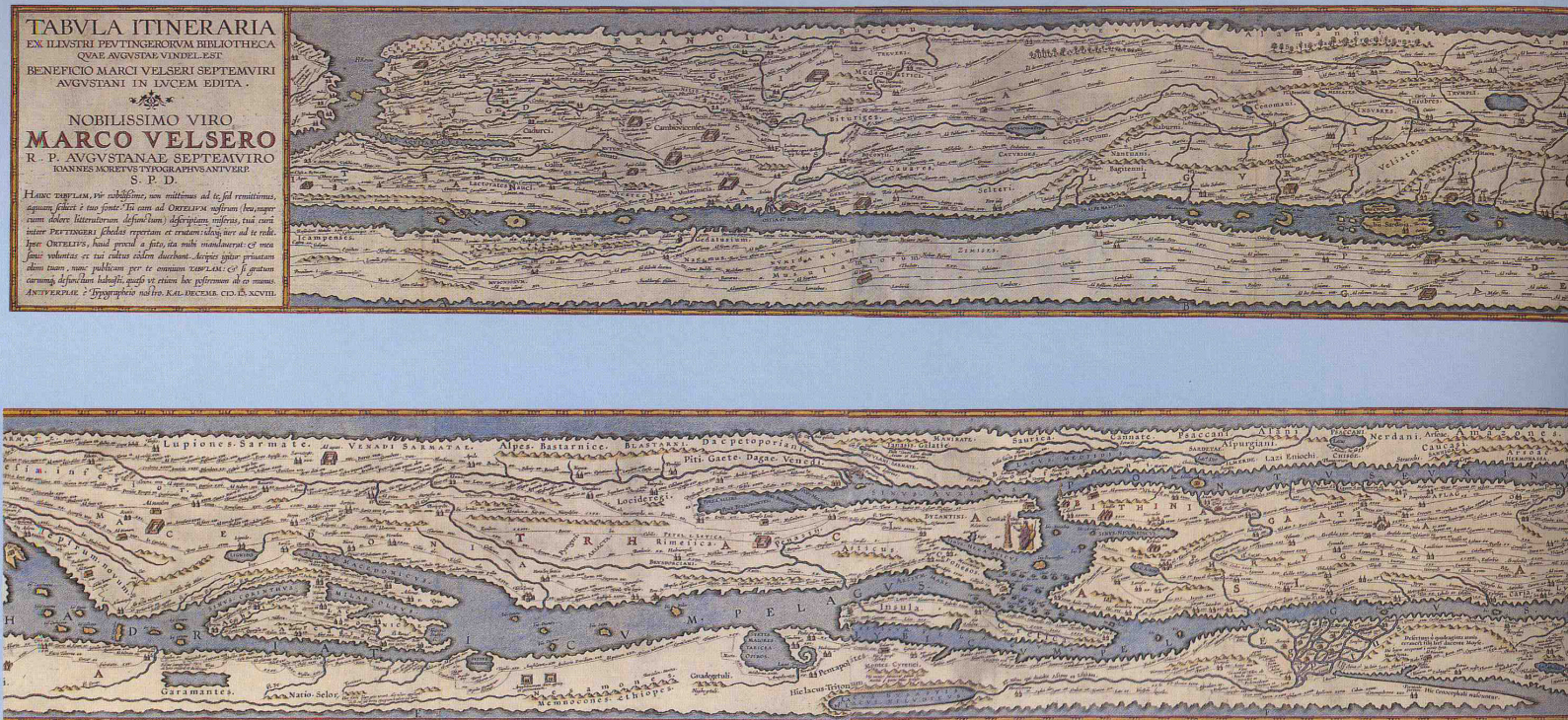
Tabula Peutingeriana, 100 CE #120



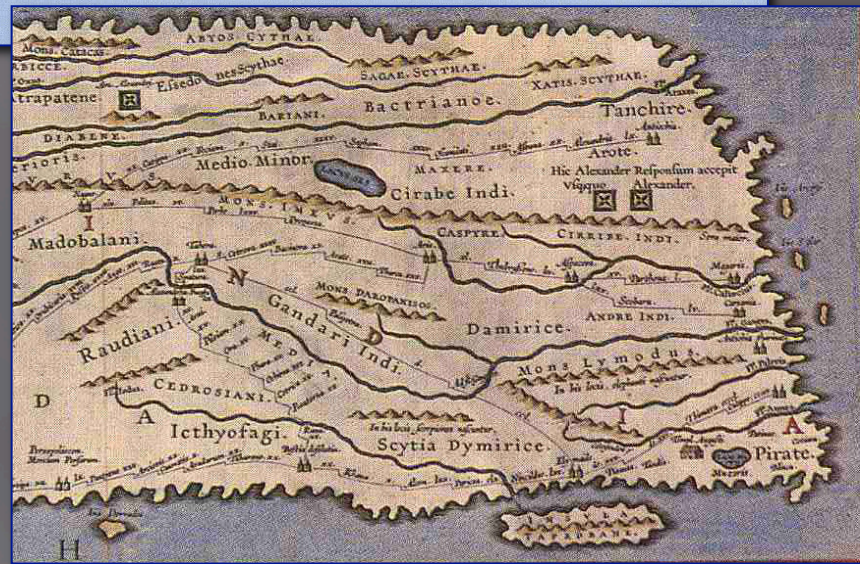
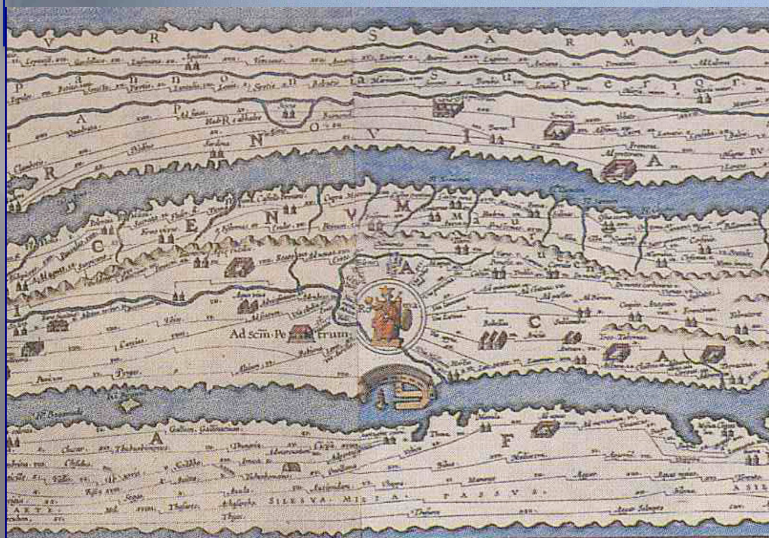
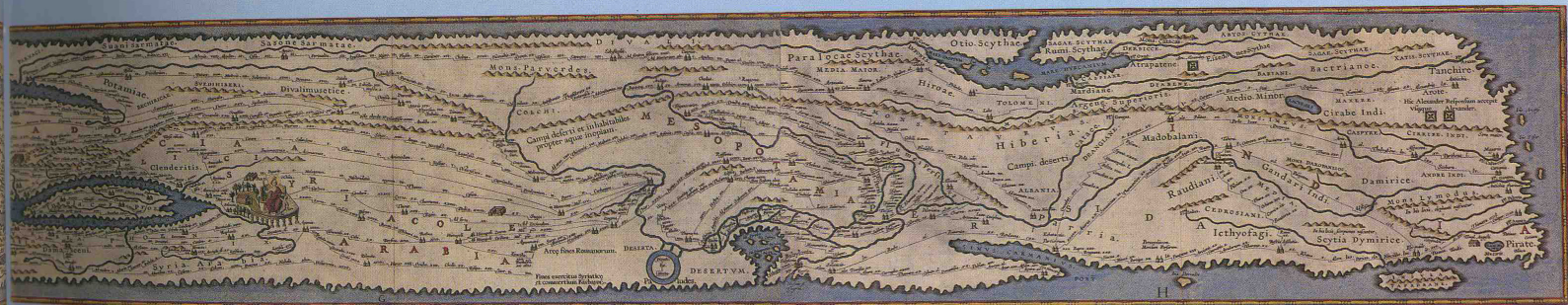
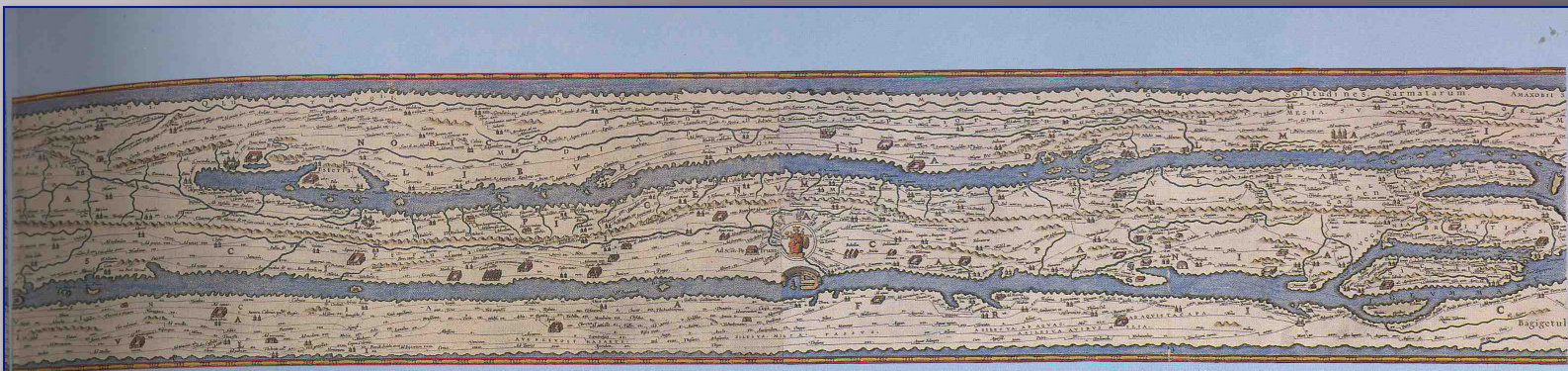
the only surviving example of an *itinerarium pictum*, a visual guide to the Roman road system. The assumption is that the map was drawn during the reign of Emperor Theodosius.

Peutinger Table contents overlaid on a modern map with GIS routes & places





Segments from a copy of the
Tabula Peutingeriana, engraved
 and printed at “half-size” by
 Johannes Moerentorf (Moretus)
 in 1598



Medieval Period

Ambrosius Aurelius Theodosius Macrobius,
395-423 CE #201



Macrobius wrote a *Commentary on the Dream of Scipio*, and many medieval manuscripts of this work contain zonal *mappaemundi*, or maps that indicate the earth's climatic zones

Cosmas Indicopleustes World Map, 9th century (#202)



Cosmas Indicopleustes World Map, 9th century, predicated upon the concept of a “flat earth” and oriented with North at the top and Paradise in the East (right) where the human race dwelt until the Flood when they were transported across the now impassable Ocean.

Cosmas Indicopleustes

