# The Evolution of Africa on Early Maps: Part I

5.11

This monograph explores the evolution of the depiction of the continental landmass of present-day Africa in early maps. *Afri* was a Latin name used to refer to the inhabitants of Africa, which in its widest sense referred to all lands south of the Mediterranean (ancient *Libya).* This name seems to have originally referred to a native Libyan tribe. The name is usually connected with Hebrew or Phoenician *afar* '*dust*, but a 1981 hypothesis has asserted that it stems from the Berber *ifri* (plural *ifran*) "cave", in reference to cave dwellers. The same word may be found in the name of the Banu Ifran from Algeria and Tripolitania, a Berber tribe originally from Yafran (also known as *Ifrane*) in northwestern Libya.

According to the Romans, *Africa* lay to the west of Egypt, while *Asia* was used to refer to *Anatolia* and lands to the east. A definite line was drawn between the two continents by the Greek geographer Ptolemy (85–165 CE), indicating Alexandria along the Prime Meridian and making the isthmus of Suez and the Red Sea the boundary between Asia and Africa. As Europeans came to understand the real extent of the continent, the idea of "Africa" expanded with their knowledge over the next 1,500 years.

Other etymological hypotheses have been postulated for the ancient name "Africa":

- The first century Jewish historian Flavius Josephus (Ant. 1.15) asserted that it was named for Epher, grandson of Abraham according to Gen. 25:4, whose descendants, he claimed, had invaded Libya.
- Isidore of Seville in *Etymologiae* XIV.5.2. (seventh century CE) suggested Africa comes from the Latin *aprica*, meaning "sunny".
- Massey, in 1881, stated that Africa is derived from the Egyptian *af-rui-ka*, meaning "to turn toward the opening of the Ka." The *Ka* is the energetic double of every person and the "opening of the Ka" refers to a womb or birthplace. Africa would be, for the Egyptians, "the birthplace."
- Michèle Fruyt proposed linking the Latin word with *africus* [south wind], which would be of Umbrian origin and mean originally "rainy wind".
- Robert R. Stieglitz of Rutgers University proposed: "The name Africa, derived from the Latin *Aphir-ic-a*, is cognate to Hebrew *Ophir*."

Africa is the world's second-largest and second-most-populous continent (the first being Asia). At about 30.3 million km² (11.7 million square miles) including adjacent islands, it covers 6% of earth's total surface area and 20.4% of its total land area. With 1.2 billion people as of 2016, it accounts for about 16% of the world's human population. The continent is surrounded by the Mediterranean Sea to the north, both the Suez Canal and the Red Sea along the Sinai Peninsula to the northeast, the Indian Ocean to the southeast and the Atlantic Ocean to the west. Geopolitically, Egypt's Sinai Peninsula east of the Suez Canal is often considered part of Africa, as well. The continent includes Madagascar and various archipelagos. Today it contains 54 fully recognized sovereign states (countries), nine territories and two de facto independent states with limited or no

recognition, most of which have borders that were drawn during the era of European colonialism.

Africa is considered by most paleoanthropologists to be the oldest inhabited territory on earth, with the entire human species originating from the continent. Africa, particularly central Eastern Africa, is widely accepted as the place of origin of humans and the *Hominidae clade* (great apes), as evidenced by the discovery of the earliest *hominids* and their ancestors, as well as later ones that have been dated to around seven million years ago, including *Sahelanthropus tchadensis, Australopithecus africanus, A. afarensis, Homo erectus, H. habilis* and *H. ergaster*—with the earliest *Homo sapiens* (modern human) found in Ethiopia being dated to circa 200,000 years ago. Africa straddles the equator and encompasses numerous climate areas; it is the only continent to stretch from the northern temperate to southern temperate zones.

Africa hosts a large diversity of ethnicities, cultures and languages. In the late 19th century European countries colonized almost all of Africa. Africa also varies greatly with regard to environments, economics, historical ties and government systems. However, most of the present states in Africa originate from a process of decolonization in the 20th century.

Africa forms a half-way house in geography, Egypt and its northern coasts being known in remote antiquity, its southernmost tip was not reached until 1487 by Bartholomew Diaz, and its center practically unknown until the late 19th century. At about 3300 BCE, the historical record opens in Northern Africa with the rise of literacy in the Pharaonic civilization of Ancient Egypt. One of the world's earliest and longest-lasting civilizations, the Egyptian state continued, with varying levels of influence over other areas, until 343 BCE Egyptian influence reached deep into modern-day Libya and Nubia.

European exploration of Africa began with Ancient Greeks and Romans. In 332 BCE, Alexander the Great was welcomed as a liberator in Persian-occupied Egypt. He founded Alexandria in Egypt, which would become the prosperous capital of the Ptolemaic dynasty after his death.

In antiquity the Greeks are said to have called the continent *Libya* and the Romans called it *Africa*, perhaps from the Latin *aprica* [sunny] or the Greek *aphrike* [without cold]. The name *Africa*, however, was chiefly applied to the northern coast of the continent, which was, in effect at the time, regarded as a southern extension of Europe. Knowledge of southern Africa was almost non-existent, as was that of northern Europe and the Far East. The Romans, who for a time ruled the North African coast, are also said to have called the area south of their settlements *Afriga*, or the *Land of the Afrigs*—the name of a Berber community south of Carthage.

Pre-colonial Africa possessed perhaps as many as 10,000 different states and polities characterized by many different sorts of political organization and rule. These included small family groups of hunter-gatherers such as the *San* people of southern Africa; larger, more structured groups such as the family clan groupings of the Bantu-

speaking peoples of central, southern, and eastern Africa; heavily structured clan groups in the Horn of Africa; the large *Sahelian* kingdoms; and autonomous city-states and kingdoms such as those of the *Akan; Edo, Yoruba*, and *Igbo* people in West Africa; and the Swahili coastal trading towns of southeast Africa.

By the ninth century CE, a string of dynastic states, including the earliest Hausa states, stretched across the sub-Saharan savannah from the western regions to central Sudan. The most powerful of these states were Ghana, Gao, and the Kanem-Bornu Empire. Ghana declined in the 11th century, but was succeeded by the Mali Empire that consolidated much of western Sudan in the 13th century. Kanem accepted Islam in the 11th century.

In the late 19th century, the European imperial powers engaged in a major territorial scramble and occupied most of the continent, creating many colonial territories, and leaving only two fully independent states: Ethiopia (known to Europeans as *Abyssinia*), and Liberia. Egypt and Sudan were never formally incorporated into any European colonial empire; however, after the British occupation of 1882, Egypt was effectively under British administration until 1922.

Africa's total land area is approximately 11,724,000 square miles (30,365,000 square km), and the continent measures about 5,000 miles (8,000 km) from north to south and about 4,600 miles (7,400 km) from east to west. From the most northerly point, Ras ben Sakka in Tunisia (37°21' N), to the most southerly point, Cape Agulhas in South Africa (34°51'15" S), is a distance of approximately 8,000 km (5,000 mi); from Cape Verde, 17°33'22" W, the westernmost point, to Ras Hafun in Somalia, 51°27'52" E, the most easterly projection, is a distance of approximately 7,400 km (4,600 mi). The coastline is 26,000 km (16,000 mi) long, and the absence of deep indentations of the shore is illustrated by the fact that Europe, which covers only 10,400,000 km2 (4,000,000 sq mi) – about a third of the surface of Africa – has a coastline of 32,000 km (20,000 mi). In the northeast, Africa was joined to Asia by the Sinai Peninsula until the construction of the Suez Canal. Paradoxically, the coastline of Africa—18,950 miles (30,500 km) in length—is shorter than that of Europe, because there are few inlets and few large bays or gulfs.

Off the coasts of Africa a number of islands are associated with the continent. Of these Madagascar, one of the largest islands in the world, is the most significant. Other, smaller islands include the Seychelles, Socotra, and other islands to the east; the Comoros, Mauritius, Réunion, and other islands to the southeast; Ascension, St. Helena, and Tristan da Cunha to the southwest; Cape Verde, the Bijagós Islands, Bioko, and São Tomé and Príncipe to the west; and the Azores and the Madeira and Canary islands to the northwest.

The continent is cut almost equally in two by the equator, so that most of Africa lies within the tropical region, bounded on the north by the Tropic of Cancer and on the south by the Tropic of Capricorn. Because of the bulge formed by western Africa, the greater part of Africa's territory lies north of the equator. Africa is crossed from north to south by the prime meridian (0° longitude), which passes a short distance to the east of Accra, Ghana.

The northwestern part, which includes the Sahara (desert) and that part of North Africa known as the *Maghrib*, has two mountainous regions—the Atlas Mountains in northwestern Africa, which are believed to be part of a system that extends into southern Europe, and the Ahaggar (Hoggar) Mountains in the Sahara.

One of the most influential and significant features of the African continent is the Nile River. This river is a major north-flowing river in northeastern Africa, and is

commonly regarded as the longest river in the world, though some sources cite the Amazon River as the longest. The Nile, which is 6,853 km (4,258 miles) long, is an "international" river, its drainage basin covers eleven countries: Tanzania, Uganda, Rwanda, Burundi, the Democratic Republic of the Congo, Kenya, Ethiopia, Eritrea, South Sudan, Republic of the Sudan and Egypt. In particular, the Nile is the primary water source of Egypt and Sudan.

The Nile has two major tributaries, the White Nile and Blue Nile. The White Nile is considered to be the headwaters and primary stream of the Nile itself. The Blue Nile, however, is the source of most of the water and silt. The White Nile is longer and rises in the Great Lakes region of central Africa, with the most distant source still undetermined but located in either Rwanda or Burundi. It flows north through Tanzania, Lake Victoria, Uganda and South Sudan. The Blue Nile begins at Lake Tana in Ethiopia and flows into Sudan from the southeast. The two rivers meet just north of the Sudanese capital of Khartoum.


The integrated northern section of the river flows north almost entirely through the Sudanese desert to Egypt, then ends in a large delta and flows into the Mediterranean Sea. Egyptian civilization and Sudanese kingdoms have depended on the river since ancient times. Most of the population and cities of Egypt lie along those parts of the Nile valley north of Aswan, and nearly all the cultural and historical sites of Ancient Egypt are found along riverbanks.

In the ancient Egyptian language, the Nile is called *Ḥ'pī* or *Iteru* (Hapy), meaning "river". The English name *Nile* and the Arabic names *en-Nîl* and *an-Nîl* both derive from the Latin *Nilus* and the Ancient Greek Νεῖλος. Beyond that, however, the etymology is disputed. The standard English names "White Nile" and "Blue Nile", to refer to the river's source, derive from Arabic names formerly applied only to the Sudanese stretches which meet at Khartoum.

Above Khartoum, the Nile is known as the *White Nile*, a term also used in a limited sense to describe the section between Lake No and Khartoum. At Khartoum the river is joined by the Blue Nile. The White Nile starts in equatorial East Africa, and the Blue Nile begins in Ethiopia. Both branches are on the western flanks of the East African Rift. The source of the White Nile is sometimes considered to be Lake Victoria, but the lake has feeder rivers of considerable size. Gish Abay is reportedly the place where the "holy water" of the first drops of the Blue Nile develop.

The Nile has been the lifeline of civilization in Egypt since the Stone Age, with most of the population and all of the cities of Egypt resting along those parts of the Nile valley lying north of Aswan. However, the Nile used to run much more westerly through what is now Wadi Hamim and Wadi al Maqar in Libya and flow into the Gulf of Sidra. As sea level rose at the end of the most recent ice age, the stream which is now the northern Nile pirated/diverted the ancestral Nile near Asyut, this change in climate also led to the creation of the current Sahara desert, around 3,400 BCE.

The Greek historian Herodotus wrote that "Egypt was the gift of the Nile". An unending source of sustenance, it provided a crucial role in the development of Egyptian civilization. Silt deposits from the Nile made the surrounding land fertile because the river overflowed its banks annually. The Ancient Egyptians cultivated and traded wheat, flax, papyrus and other crops around the Nile. Wheat was a crucial crop in the famine-plagued Middle East. This trading system secured Egypt's diplomatic relationships with other countries, and contributed to economic stability. Far-reaching trade has been carried on along the Nile since ancient times.

Owing to their failure to penetrate the sudd wetlands of South Sudan, the upper reaches of the Nile remained largely unknown to the ancient Greeks and Romans. Various expeditions failed to determine the river's source. Agatharcides records that in the time of Ptolemy II Philadelphus, a military expedition had penetrated far enough along the course of the Blue Nile to determine that the summer floods were caused by heavy seasonal rainstorms in the Ethiopian Highlands, but no European of antiquity is known to have reached Lake Tana. The *Tabula Rogeriana,* a map and globe by Abu Abdullah Mohammed Ibn al-Sharif al-Idrisi [Edrisi*] (see monograph* ***#219****),* depicted the source of the Nile as three lakes in 1154.

Europeans began to learn about the origins of the Nile in the 15th and 16th centuries, when travelers to Ethiopia visited Lake Tana and the source of the Blue Nile in the mountains south of the lake. Although James Bruce claimed to be the first European to have visited the headwaters, modern writers give the credit to the Jesuit Pedro Páez. Páez's account of the source of the Nile is a long and vivid account of Ethiopia. It was published in full only in the early 20th century, although it was featured in works of Páez's contemporaries, including Baltazar Téllez, Athanasius Kircher and by Johann Michael Vansleb.

Europeans had been resident in Ethiopia since the late 15th century, and one of them may have visited the headwaters even earlier without leaving a written trace. The Portuguese João Bermudes published the first description of the Tis Issat Falls in his 1565 memoirs, compared them to the Nile Falls alluded to in Cicero's *De Republica*. Jerónimo Lobo describes the source of the Blue Nile, visiting shortly after Pedro Páez. Telles also used his account.

The White Nile was even less understood. The ancients mistakenly believed that the Niger River, in Northwestern Africa, represented the upper reaches of the White

Nile. For example, Pliny the Elder wrote that the Nile had its origins "in a mountain of lower Mauretania", flowed above ground for "many days" distance, then went underground, reappeared as a large lake in the territories of the Masaesyli, then sank again below the desert to flow underground "for a distance of 20 days' journey till it reaches the nearest Ethiopians."

## Cartographically

**Ancient Period.**

As Oscar Norwich states in his book *Maps of Africa*, in looking for the oldest maps of Africa, we should turn to the peoples of the continent itself. After all, Africa is associated with the origins of the human species and the earliest known maps of any part of Africa are archaeological artifacts, in the form of Neolithic rock paintings in southern Algeria. However, our knowledge of early mapmaking within indigenous African cultures is rudimentary. Evidence of the compilation of maps or plans in Pharonic Egypt is often quoted but surprisingly modest. There seems to be no evidence of the use of maps, plans or other cartographic devices among the later Bantu-speaking societies of central, east and southern Africa, or among the sub-Saharan states of West Africa, although schematic diagrams are recorded from 18th century Ethiopia. Perhaps the maps of non-literate societies in Africa were so ephemeral that none have survived. A sketch map drawn in the sand may have been the characteristic means of communicating mental images of the relative location of places, but it would not last very long. Alternatively, perhaps we have not yet recognized amongst the surviving artifacts of past societies in Africa what are, in the broadest sense, maps. Certainly, the evidence of recorded maps and plans in libraries, museums and private collections implies that the history of African cartography is a history of the interaction of external and internal cultures and societies, with the actual production of the documents taking place outside the continent. The written history of the cartography of Africa is a peculiarly distorted history. It is the outsider's view of Africa, primarily a Eurocentric point of view with Islamic inputs, in which the internal African contribution is not always adequately identified.

Cartography, the act of making and studying maps, serves as a powerful example of the way in which notions of representation and image are used and expressed over time. The earliest references to African cartography date back to re-colonial Africa. African cartography can be said to start from the 12th century BCE in greater Egypt, then continued by the Phoenicians as maps were a prime source for their supposed circumnavigation of Africa as early as 600 BCE. By the middle of the second century CE, Claudius Ptolemy, working on the mapping of Ethiopia, the Sahara and the Great Lakes, was already heir to a long geographical tradition. Maps also played a crucial role in the expansion of Arab trade routes and aided in the extensive penetration of Islam through North Africa and across the Sahara by the 12th century CE. The examples of the cartography of antiquity defined the science as an exploration of the interior of the African continent and the accumulation of its knowledge for future penetration. The description and mapping of Africa begins with the European cultures as early as 900 BCE The depiction of the African continent on world or regional maps probably began with the writings of the Greek philosophers, historians and cosmographers. While no contemporary maps from these ancient writers have survived, reconstructions of their "world" maps have been created by more modern historians based upon the extensive ancient writings.

First of all, to clarify certain terms. The learned ancient cosmographers and writers, for the most part, believed in a spherical, or round earth. The earliest recorded mention of an earth globe is of the one made by Crates of Mallos (200 BCE – see monograph ***#113***), ten feet in diameter and described by Strabo in his *Geographica*; Book ii. chap. v. paragraph 10 ***#115***. What they discussed and probably depicted graphically

was, except for Crates, limited to the known inhabited part of that world, called the *oecumene [oikumeme].* Crates attempted to conceptualize the entire world, predicting the existence of both North and South America.

The following summary of the evolution of the geography of Africa is provided by Sandra Young in her article "Early modern geography and the construction of a knowable Africa".

Africa was integral to the early preoccupation with being able to account for the "whole" world in seemingly scholarly fashion. The Africa that took shape in early geographies was not imagined in isolation: its cultural geography was linked to other regions of the world in a comparative system that helped to distinguish between the "barbarous" and those "worthy" to be called human, and between the "Southern Nations" and the "Northern People." It contributed to the emergence of a global south, made explicit through the language of cartography, which allowed early readers to gain their bearings in a more complex world.

It must be said at the outset that we have little contemporary evidence for ancient Greco-Roman or Egyptian maps. In the modern world, the nature of communications allows original texts and graphics to be preserved, transmitted and accessed for extended periods of time. The pre-modern world, on the other hand, had only a series of copies to work with, made over the centuries on organic (perishable) material. The process was almost manageable for texts, multiple copies of which could be created by copyist teams working from dictation. But it was not feasible for graphics, the copying of which inevitably led to increasing distortion. Copies of copies of copies must generally have been very different from the vanished original, hence the scarcity of scholarly, illustrations transmitted from the ancient world.

Methods for accurately reproducing and eventually printing maps in sufficient quantities to enable cartographical knowledge to 'penetrate very deep' are in fact a feature only of modern times. Gutenberg's invention of moving type in the 15th century did not lead to the multiplication of maps. Only Senefelder's invention of lithography in 1796, and the innovative use of it for the mass printing of graphics, including in color, in the century that followed, allowed maps to be printed and distributed in quantity. This allowed general access to accurate maps and led, *inter alia*, to the introduction of geography as a school subject; the invention of the school atlas in the late 19th century; and the deep penetration of cartographic information to almost all members of industrial societies from the late 19th century on. Any assumption that maps were widely available in the pre-industrial world thus derives from anachronistic thinking based on later developments.

It is nonetheless the case that many modern school atlases could not (and cannot) resist the temptation to reconstruct ancient maps by combining modern knowledge about the shape of the earth's landmass with data from ancient texts. As displayed in this volume, the 19th century in particular saw many such reconstructions, but even the most recent grand atlas of the ancient world, which accompanies the *Neue Pauly* encyclopedia, and in the illustrious *History of Cartography* (Volume One) presents reconstructions/interpretations of the world maps of Homer, Hecataeus, Herodotus, Eratosthenes, Strabo and Ptolemy. According to researcher Daniela Dueck such reconstructions introduce a host of unwanted modern concepts into the ancient data: north is on top, for example; the shape of coastlines for which no ancient descriptions are available is the familiar modern one (e. g., Italy reconstructed in the shape of a boot

— a modern idea unknown in the ancient world); or color is used to mark the continents and the sea. There is no evidence for the use of such forms of representation in ancient maps. That said, it is only natural that modern or later historians, in reading geographical writings by ancient philosophers, would attempt to "visualize" these terrestrial descriptions and world concepts. These later-day "graphical translations" would always be influenced by their superior knowledge of the known world, thus giving the shapes of landmasses a rather "modern" look. There is no way we can truly graphically translate or capture the real ancient contemporary mind's eye of what they were envisioning when they wrote their geographical descriptions any more than a blind person imagine what a sighted person sees.

With these caveats in mind, below is a series of reconstructed maps based upon the geographical writings of prominent Greek philosophers. Some of the reconstructed maps/world-views that are found herein have been constructed in modern times using the best available ancient textual references. Other reconstructions are much older, such as the Byzantine monk Maximos Planudes (1260-1310), who, after a long search, discovered a manuscript of the *Geographia* of the Alexandrian astronomer Claudius Ptolemy (second century CE), and celebrated his find in verse. Since the maps were missing, he drew them himself from indications in the ancient text, and when the work was finished, he commemorated this too in verse. After the fall of Byzantium in 1453, its conqueror, the Turkish Sultan Mohammed II, found in the library that he inherited from the Byzantine rulers a manuscript of Ptolemy's *Geographia*, which lacked the world-map, and he commissioned Georgios Aminutzes, a philosopher in his entourage, to draw up a world map based on Ptolemy's text. He knew it would be out of date, but that is precisely what he wanted - an ancient map; to perpetuate it, he also had a carpet woven from the drawing.

The early European cultures of Greece and Rome knew very little-to-nothing about sub-Saharan Africa, Northern Europe or the Far East. Likewise, the Chinese and Japanese knew little-to-nothing about Europe or Africa. It was the extensive trading along the littoral regions of the Mediterranean and the dynasties of Egypt that exposed only the northern portion of Africa to the cultures in Europe and the Middle East.

Herodotus 4.191 places a range of animal and human monsters in the distant western edge of Africa:

> It is here that huge snakes are found and lions, elephants, bears, asps and horned asses, not to mention dog-headed men, headless men with eyes on their breasts (I don't vouch for this, but merely repeat what Libyans say), wild men and wild women and a great many other creatures of by no means a fabulous kind.

Africa, whose interior was poorly known, continued to attract this type of myth for centuries. Aristotle, *On the Generation of Animals* 746b7–13, mentions the proverb that "Libya always nurtures some new thing," which alludes to the tendency of new heterogeneous creatures to appear there. Aristotle ascribes one another at water holes and there interbreed. Pomponius Mela, in his *De situ orbis*, locates some monsters in Africa that other authors place in Asia. The Roman historian Pliny the Elder (*Naturalis historia* 7.2.21) remarks that India and Ethiopia were particularly abundant in marvels, and (8.17.42) that Africa was always producing something new; and he describes a number of monstrous human hybrids resident in both of these regions, such as men with dogs' heads, men whose faces are in their chests, men with giant ears, and so on.

The number of monstrous races that Pliny places in Africa is not large: just the *blemmyae*, or headless men whose faces are in their chests; *satyrs* (5.8.46); the *himantopodes*, who have long feet like leather thongs (5.8.46); the *hermaphrodites* (7.3.34); and the *pygmies* (6.35.188). Isidore, in his enumeration of the monstrous races in his *Rtymologies* 11.3.12–39, locates several in Africa, and Solinus, in his *De mirabilibus mundi*, also places several monstrous races in the far reaches of Africa, beyond Ethiopia. These passages inspired a striking iconographic tradition in some *mappaemundi* of illustrating the monstrous races in a strip of land in southern Africa at the very edge of the earth as exemplified in the *Hereford (**#226**), Ebstorf (**#224**)* and *Psalter (**#223**) mappaemundi* of the Middle Ages.

**Ancient Egyptian Cartography**

Egypt, which exercised so strong an influence on the ancient civilizations of southeast Europe and the Near East, has left us no more numerous cartographic documents than her contemporary neighbor Babylonia. Geographical knowledge, however, was highly developed in early Egypt. The Pharaohs organized military campaigns, trade missions, and even purely geographical expeditions to explore various countries. One of the earliest of such journeys known to us was undertaken in the years 1,493-92 BCE by sea to the land of *Punt* [probably Ethiopia/Somaliland]. This is described in an inscription in the Temple of Der-el-Bahri where the ship used for this journey is delineated, but there is no map. Herodotus tells of another voyage, under the Pharaoh Necho II (ca. 596-94 BCE) on which the Egyptians sailed down the Red Sea, completely circumnavigating Africa, and back to Alexandria by way of the *Pillars of Hercules* [Straits of Gibraltar]. This earliest recorded circumnavigation was not known anywhere within Europe and led to many misconceptions about the continent of Africa for the next 2,000 years. Many other pieces of geographical information are to be found in inscriptions on temple walls and in papyri, but without maps and, again not widely known outside of Egypt.

We are not really given a reason for this expedition, though it would seem that such voyages were made for economic gain. Considering the control of the northern shores of the Mediterranean by the Greeks and of the southern coasts by the Phoenicians, the only region where Egypt, with its inferior naval fleet, might acquire some influence and wealth would have been eastern Africa, where they had already established some trade. However, it has also been suggested that the voyage might have served a military purpose.

According to Herodotus, Necho II ordered a Phoenician-crewed fleet to leave Egypt from the east by way of the Gulf of Suez and to return via the Straits of Gibraltar at the Mediterranean's western mouth. Hence, he expected this expedition to navigate around Africa counterclockwise. This would be a long journey, in which the crew would help support themselves by establishing temporary settlements on land where they would cultivate crops during the voyage.

According to the story, after two full years the fleet eventually rounded the *Pillars of Hercules* (the Straits of Gibraltar), and returned to Egypt during the course of the third year. Herodotus' story has a surprising conclusion:

> Libya is washed on all sides by the sea except where it joins Asia, as was first demonstrated, so far as our knowledge goes, by the Egyptian king Necho, who, after calling off the construction of the canal between the Nile and the Arabian gulf, sent out a fleet manned by a Phoenician crew with orders to sail west about and return to Egypt and the Mediterranean by way of the Straits of Gibraltar. The

> Phoenicians sailed from the Arabian Gulf [Red Sea] into the southern ocean, and every autumn put in at some convenient spot on the Libyan coast, sowed a patch of ground, and waited for next year's harvest. Then, having got in their grain, they put to sea again, and after two full years rounded the Pillars of Heracles in the course of the third, and returned to Egypt. These men made a statement which I do not myself believe, though others may, to the effect that as they sailed on a westerly course round the southern end of Libya, they had the sun on their right - to northward of them. This is how Libya was first discovered by sea.

This is exactly what they would have seen going west around the Cape of Good Hope at the southern tip of Africa, because the sun appears to the right when traveling westward in the southern hemisphere, but how could Herodotus have known this at such an early date if the journey did not take place. Outside of Herodotus' account, there is little or no evidence of such a voyage. However, most of his story appears to at least be plausible, and it should be noted that this voyage took place not so very distant from Herodotus' own time. His *Histories* were written in about 440 BCE, while Necho II came to the Egyptian throne in about 610 BCE.

The Egyptians would have known, for some time, a certain length of Africa's east coast, for they had from earlier times been making visits to the *Land of Punt*. Though *Punt's* exact location remains unknown, it was almost certainly on Africa's east coast somewhat south of Egypt. The Phoenicians had been in contact with the Atlantic since the trading port of *Gadir* (modern Cadiz) was founded in about 800 BC. They also possessed ships that were capable of sailing through the Straits of Gibraltar and along the North African coast, so technically a trip around Africa would have been possible. In fact, the winds and currents favor an east-west circumnavigation of Africa, and navigation would have been no problem if they kept the coast in sight. Furthermore, the Egyptians had for many years undertook sea voyages to Byblos, on the Levantine coast, and to *Punt* by way of the Red Sea. Though the circumnavigation of Africa under Vasco da Gama, who sailed from Lisbon in Portugal to Calicut in India, took only ten months between 1497 and 1498, the two and a half year journey of the Phoenician ships also seems reasonable, especially considering their layover to replenish their supplies.

There can be no doubt, however, that the ancient Egyptians had cadastral drawings. Egypt was undoubtedly a land of accurate measurement. From earliest times much of the area covered by the annual Nile floods had, upon their retreat, to be re-surveyed in order to establish the exact boundaries of properties. But there is no records that indicate an interest by the Egyptians in describing or graphically illustrating larger territory such as the continent upon which they lived. (see monograph ***#102**, the Turin papyrus*). No known ancient Egyptian world concept description or map is known to have survived.

**Ancient Greek and Roman Cartography**

Greek civilization started in the Minoan-Mycenaean Age (2,100-1,100 BCE) and arguably continued to the fall of the empires of Byzantium and Trebkond in the 15th century A.D. Within this span of some three thousand years, the main achievements in Greek cartography took place from about the sixth century BCE to the culminating work of the Greek Claudius Ptolemy in the second century CE. This seminal area of history is conveniently divided by Germaine Aujac (in Harley's *History of Cartography*, Volume One) into several periods: the *Archaic* and *Classical* Period (to the fourth century BCE),

the *Hellenistic* Period (fourth and third centuries BCE), the *Early Greco-Roman* Period (second century BCE to the second century CE), and the *Age of Ptolemy* (second century CE).

Both Strabo ***(#115)*** and Agathemerus (a later Greek geographer) in their writings claim that, according to the geographer Eratosthenes ***(#112)***, Anaximander ***(#107)*** was the first to publish a map of the world. The map probably inspired the Greek historian Hecataeus of Miletus ***(#108)*** to draw a more accurate version. Strabo viewed both as the first geographers after Homer ***(#105)***.

Local regional maps were produced in ancient times, notably in Egypt, Lydia, the Middle East, and Babylon. They indicated roads, towns, borders, and geological features. Anaximander's innovation was to represent the entire inhabited land known to the ancient Greeks. Such an accomplishment is more significant than it at first appears. Anaximander most likely drew this map for three reasons. First, it could be used to improve navigation and trade between Miletus' colonies and other colonies around the Mediterranean Sea and Black Sea. Second, Thales would probably have found it easier to convince the Ionian city-states to join in a federation in order to push the Median threat away if he possessed such a tool. Finally, the philosophical idea of a global representation of the world simply for the sake of knowledge was reason enough to design one.

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

*The Greek Cartographers*

It has often been remarked that the Greek contribution to cartography lay in the speculative and theoretical realms rather than in the practical realm, and nowhere is this truer than in the *Archaic* and *Classical* Period. Large-scale terrestrial mapping, in particular, lacked a firm empirical tradition of survey and first-hand observation. Even at the end of the period, the geographical outlines of the *oikumeme* [known inhabited world] were only delineated as a high level sketch. Moreover, for the historian of cartography, this early period poses particular problems as much through the scanty nature of the evidence as through the difficulty of its interpretation. No cartographic artifacts clearly define a beginning to the period. The links, for example, with the earlier Babylonian and Egyptian cartography can be only tentatively established, and the extent to which the early Greeks were influenced by such knowledge remains a matter for conjecture. While there is some circumstantial evidence for both the transmission and the reception of important mathematical concepts relevant to cartography - and even for the descent of the basic design of the world map - direct documentary proof for such connections is lacking.

The monographs included within this website that describe maps/mapmakers from the *Archaic* and *Classical Period* include the following:

- **#105**, Homer's World View (900 BCE)
- **#106**, Earth Views from Thales, Anaximander, and Hecatæus
- **#106A**, The Frame of Greek World Maps
- **#107**, Anaximenes of Miletus (600 BCE)
- **#108**, Hecatæus' World Map (500 BCE)

There is no complete break between the development of cartography in *Classical* and in *Hellenistic* Greece. In contrast to many periods in the ancient and medieval world and despite the fragmentary artifacts, we are able to reconstruct throughout the Greek period, and indeed into the Roman, a continuum in cartographic thought and practice. Certainly the achievements of the third century BCE in Alexandria had been prepared for and made possible by the scientific progress of the fourth century. Eudoxus had already formulated the geocentric hypothesis in mathematical models; and he had also translated his concepts into celestial globes that may be regarded as anticipating the *sphairopoiia* [mechanical spheres]. By the beginning of the *Hellenistic* Period there had been developed not only the various celestial globes, but also systems of concentric spheres, together with maps of the inhabited world that fostered a scientific curiosity about fundamental cartographic questions. The relative smallness of the known inhabited world, for example, later to be proved by Eratosthenes, had already been dimly envisaged. It had been the subject of comment by Plato, while Aristotle had quoted a figure for the circumference of the earth from "the mathematicians" at 400,000 *stades*; he does not explain how he arrived at this figure, which may have been Eudoxus' estimate. Aristotle also believed that only the ocean prevented a passage around the world westward from the Straits of Gibraltar to India.

In spite of these speculations, however, Greek cartography might have remained largely the province of philosophy had it not been for a vigorous and parallel growth of empirical knowledge. Indeed, one of the salient trends in the history of the *Hellenistic* Period of cartography was the growing tendency to relate theories and mathematical models to newly acquired facts about the world - especially those gathered in the course of Greek exploration or embodied in direct observations such as those recorded by Eratosthenes in his scientific measurement of the circumference of the earth. Despite a continuing lack of surviving maps and original texts throughout the period - which continues to limit our understanding of the changing form and content of cartography - it can be shown that, by the period's end, a markedly different cartographic image of the inhabited world had emerged.

*Modern reconstruction of Homer's View of the World*
*Note the circumfluent ocean and the limited extent of Africa* ***(#105)***

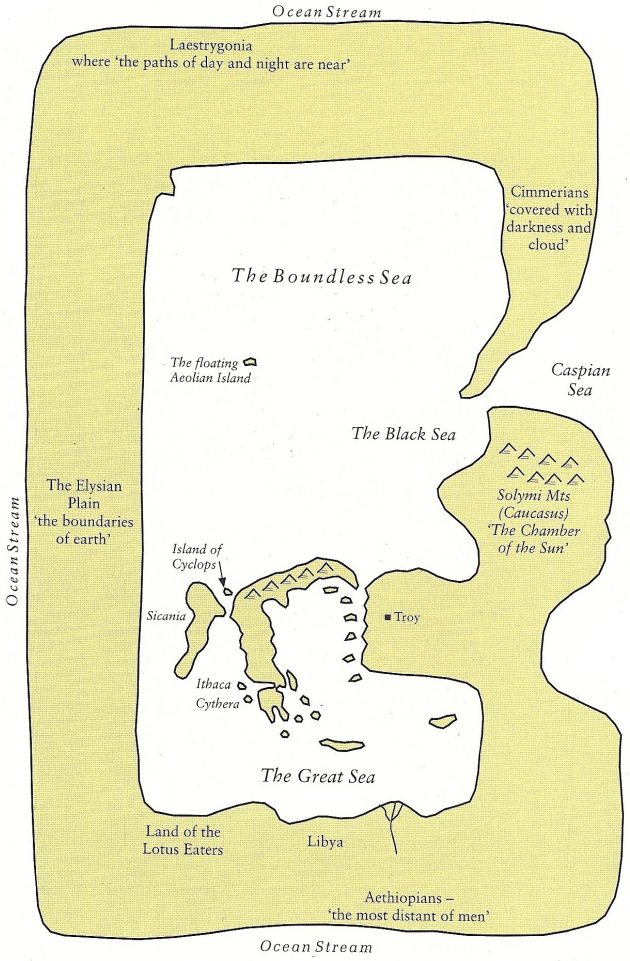
That such a change should occur is due both to political and military factors and to cultural developments within Greek society as a whole. With respect to the latter, we can see how Greek cartography started to be influenced by a new infrastructure for learning that had a profound effect on the growth of formalized knowledge in general. Of particular importance for the history of the map was the growth of Alexandria as a major center of learning, far surpassing in this respect the Macedonian court at Pella. It was at Alexandria that Euclid's famous school of geometry flourished in the reign of Ptolemy II Philadelphus (285-246 BCE). And it was at Alexandria that this Ptolemy, son of Ptolemy I Soter, a companion of Alexander, had founded the library, soon to become famous through the Mediterranean world. The library not only accumulated the greatest collection of books available anywhere in the *Hellenistic* Period but, together with the museum, likewise founded by Ptolemy II, also constituted a meeting place for the scholars of three continents.


*Another reconstruction of Homer's world concept* ***(#105)****,*
*with Africa labeled as "Lybia" and "Ethiopia"*

The librarians not only brought together existing texts, they corrected them for publication, listed them in descriptive catalogs, and tried to keep them up to date. Thus Alexandria became a clearing-house for cartographic and geographical knowledge; it was a center where this could be codified and evaluated and where, we may assume, new maps as well as texts could be produced in parallel with the growth of empirical knowledge.

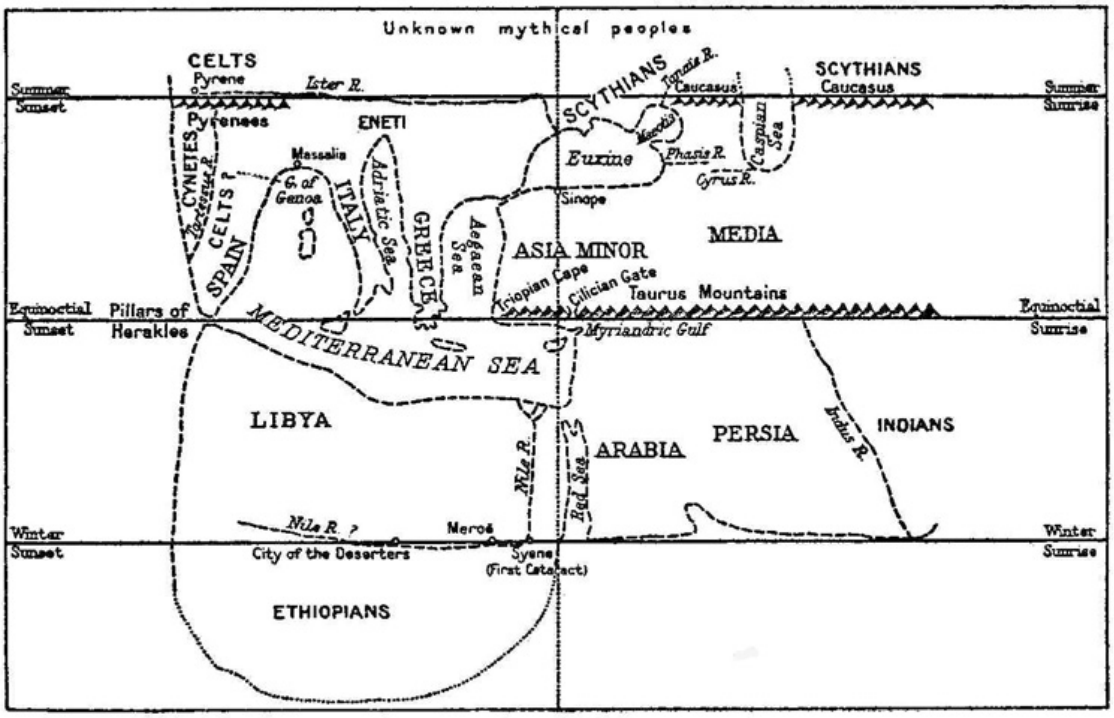
The other great factor underlying the increasing realism of maps of the inhabited world in the *Hellenistic* Period was the expansion of the Greek world through conquest and discovery, with a consequent acquisition of new geographical knowledge. In this process of strengthening the empirical content of maps the conquests of Alexander the Great, King of Macedon (356-323 BCE), were especially crucial in providing the Greek cartographers/ geographers with a far more detailed knowledge of the East than previously had been possible. Later geographers used the accounts of Alexander's journeys extensively to make maps of Asia and to fill in the outline of the inhabited world. The ambition of Eratosthenes to draw a general map of the *oikumene* based on new discoveries was also partly inspired by Alexander's exploration.

The most detailed examination of a term arising from Homeric geography ***(#105)*** is in respect of *Ethiopians*. What did Homer mean by saying they were "divided in two, some where *Hyperion* rises and some where he sets"? The historian Ephorus (ca. 405-330 BCE ***#110***) mentioned an early tradition that *Ethiopians* had overrun *Libya*, i.e., north Africa, as far as *Dyris* [the Atlas Mountains], and that some had stayed there. Crates' view was based upon an unorthodox view that the division was north-south rather than the obvious interpretation of east-west. Aristarchus of Samothrace (ca. 155 BCE) criticized Crates' interpretation, but claimed that Homer was simply wrong and there was only one area in which *Ethiopians* lived. Strabo's own view is that there were two groups of Ethiopians, one living in Asia and one in Africa; and that Homer thought likewise, though not to the extent of placing the eastern group in India, of which he had no knowledge. However, this idea of eastern *Ethiopians* living in some area of India and resembling Indians in appearance and customs persisted throughout antiquity.




*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.*

*Note the lack of continental separation/division and any attempt to show a "modern eye's" world concept.* ***(#105)***




*A reconstruction by W.A. Heidel (The Frame of the Ancient Greek Maps), of the conceptual frame of the Greeks' view of the oikumene [known inhabited world]. His sketch map illustrates the probable Greek concept of the general relationships of the oikumene to the frame at the time of Eratosthenes, and embodying the 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.*

Early maps of the world depicting Africa, as distinguished from globes, take us back to a somewhat more remote period; they all bear most of the disproportions of the Ptolemaic geography, for none belonging to the pre-Ptolemaic period are known to exist. The influence of the Ptolemaic astronomical and geographical system was very great, and lasted for over 1,300 years. Even the Arabs, who, after the fall of the Roman Empire, developed the geographical knowledge of the world during the first period of the middle ages, adopted it along with many of its errors.

As exemplified by the journeys of Alexander the Great and Pytheas, the combination of theoretical knowledge with direct observation and the fruits of extensive travel gradually provided new data for the compilation of world maps. While we can assume *a priori* that such a linkage was crucial to the development of *Hellenistic* cartography, again there is no hard evidence, as in so many other aspects of its history, that allows us to reconstruct the technical processes and physical qualities of the maps themselves. Not even the improved maps that resulted from these processes have survived, and the literary references to their existence (enabling a partial reconstruction of their content) can even in their entirety refer only to a tiny fraction of the number of maps once made and once in circulation. In this case too, the generalizations drawn herein by various authorities (ancient and modern scholars, historians, geographers, and

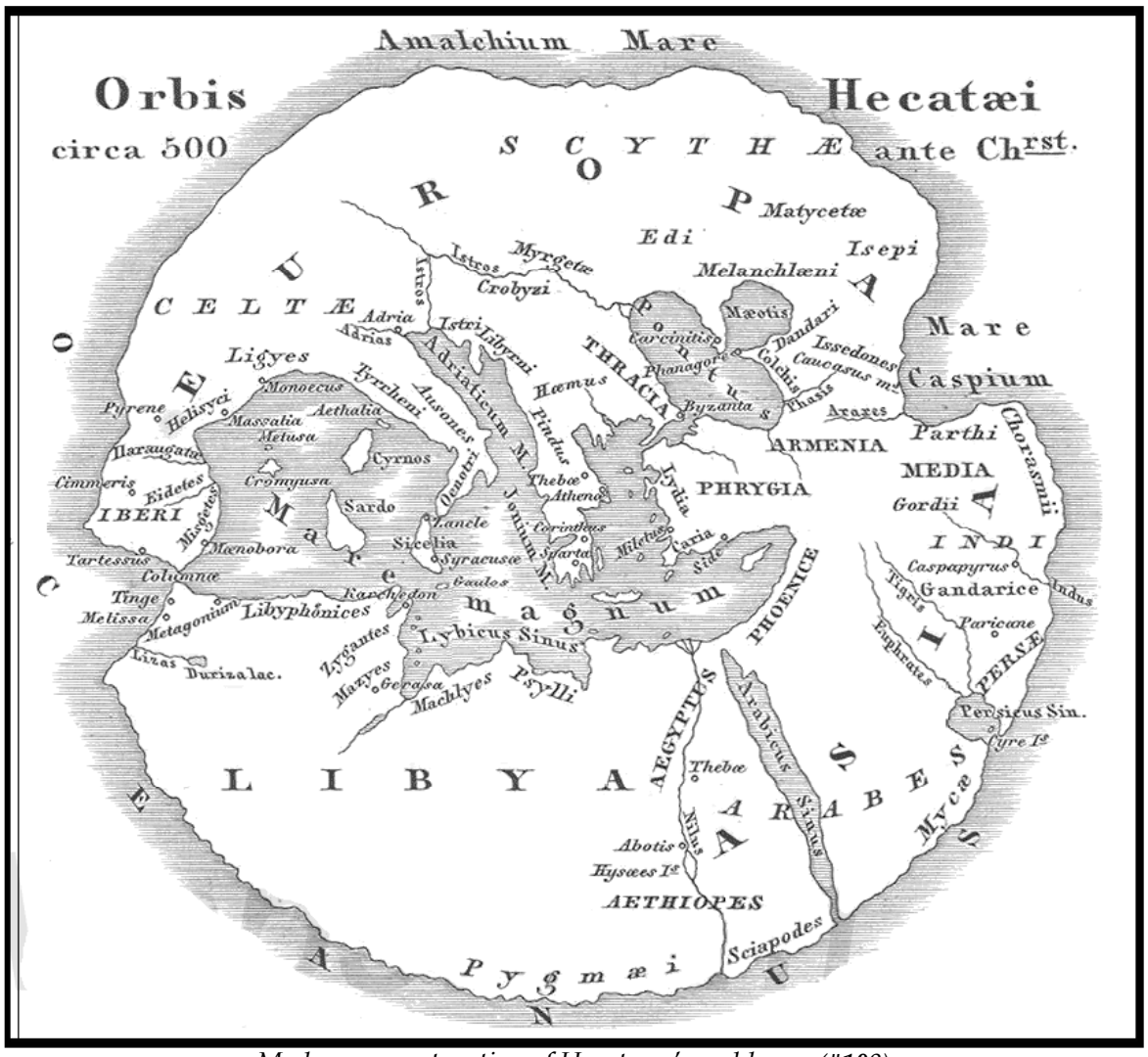
cartographers) are founded upon the chance survival of references made to maps by individual authors.

Issues of scale and perspective further obstruct us. Greek mapmakers were prone to exaggerate the size and importance of their own surroundings for more remote regions, the scale grew smaller and the details fewer. Strabo even claims that the need to know about distant places is minimal: "For purposes of government there would be no advantage in knowing such countries and their inhabitants, particularly if the people live on islands which are such that they can neither injure nor benefit us in any way because of their isolation". Moreover, there was no absolute Greek unit of length for measuring distance. To be sure, one *stadion* was reckoned as 600 Greek feet, but a standard "foot" was lacking at Olympia one *stadion* was 192.8 m, the length of the *stadium* there, while the Athenian *stadion* measured 185 m. and the Egyptian only 157.5 m. In addition, before the time of Alexander the Great (356-323) there were no coordinated efforts to map the Mediterranean world.

*Hecataeus World Concept (**#108**)*

The map of the world according to Hecataeus (a Greek historian) of Miletus in 500 BCE, was inspired by Anaximander *(see monographs **#107** and **#108**)*. Here we see that the world is divided into three continents, Europe, Asia and *Libya* [Africa], and that the western countries of the Mediterranean have gained some form and proportion. The three important seas, the Mediterranean Sea, the Red Sea and the Black Sea divide the three continents and the Caspian Sea is noted. Herodotus, the "Father of History", in 440 BCE made significant additions geographical knowledge. Having travelled over a great part of the eastern world, he writes in his fourth *Book of The Histories*, "I wonder then at those who have parted off and divided the world into Libya, Asia, and Europe, since the difference between these is not small; for in length Europe extends along by both, while in breadth it is clear to me that it is beyond comparison larger; for Libya furnishes proofs about itself that it is surrounded by sea, except so much of it as borders upon Asia...."

It was evidently the same symmetrical turn of mind that let Hecatæus to divide the world into only two great continents or primary divisions of equal extent. But this question of the division of the continents is not free from difficulty. Herodotus ridicules those who made Asia of equal size with Europe, in terms which seem to exclude all consideration of a third continent; and Hecatæus, by including all *Libya* [Africa], as well as Egypt, under the head of *Asia*, appears to have sanctioned this arrangement. On the other hand, it is clear that the division into three continents was well established in the time of Herodotus, so that he himself tells us that he continues to use the divisions and the names "*because they are sanctioned by custom,*" though he thinks them unreasonable, and without good foundation. And in another place he censures "the Ionians," who divided the world into the three portions of Europe, Asia, and Africa, but considered the last two as separated by the Nile; thus as he points out, leaving the delta unaccounted for. It is difficult to suppose that among these "Ionians" Herodotus did not mean to include Hecatæus - the most recent as well as the most eminent of Ionic writers on geography - or that, if Hecatæus had departed from the generally received doctrine on so important a subject this would not have been noticed by Herodotus. It seems therefore probable that, although Hecatæus undoubtedly divided his work into only two books or parts, the second of which included the description of *Libya* as well as that of Asia, he nevertheless recognized the established division of the three continents, regarding Asia and Africa together as equal in size to Europe.




*Modern reconstruction of Hecatæus' world map (**#108**)*
*Note the circumflent ocean, the inclusion of Africa within the bounds of Asia and a southward flowing Nile River.*

In the present day we are so accustomed to our modern maps, and to the small size of Europe, as compared to the other two great continents, that we find it difficult to represent to ourselves the opposite view. But Herodotus undoubtedly regarded Europe as greatly exceeding in size both Asia and Africa together, and, therefore, treats it as a gross blunder on the part of Hecatæus to have considered it as only equal to Asia. One point that doubtless affected the comparison was that Hecatæus regarded the Cimmerian Bosporus and the *Tanais* [i.e., the Don River] as the limit between Europe and Asia - a view generally adopted in later times - while Herodotus extended the confines of Europe to the river *Phasis*. Both systems were current in their time, as we learn from the poet Æschylus, who in one passage adopts one view, in another follows the other.

A traveler who had visited Egypt could hardly fail to have formed or adopted some theory concerning the most controverted questions respecting the Nile and its annual inundations, a subject which had already exercised the ingenuity of several of the Ionic philosophers. But on this point Hecatæus appears to have acquiesced in the view which, if we may trust to Diodorus, was that of the Egyptian priests: that the Nile derived its waters from those of the circumfluent stream of ocean - a theory which Herodotus justly sets aside as unworthy of refutation.

A similar want of judgment was displayed by him in accepting, as he appears to have done without scruple, the fabulous tales that were current in his day concerning the Pygmies and the *Sciapodes*, both which nations he placed in Ethiopia, in accordance with the opinion prevalent among the travelers of the time.

Greeks realized that maps and geographic knowledge have political value. Alexander engaged *bematists*, men whose sole job was to measure distances between places. Strabo asserts that maps are useful to governors, who can better manage affairs if they know the size of a country, the lay of the land, the peculiarities of sky and soil, and the local peoples and their customs. In his view, maps also benefit hunters for understanding the character and extent of a terrain, and commanders for pitching camp, setting ambushes, and marching in unfamiliar territory. Even so, Greek interest in mapmaking and in describing the topography and the location of settlements predates the first formal illustrative maps. Indeed, such interest goes all the way back to Homer, whom Strabo called the "father of geography."

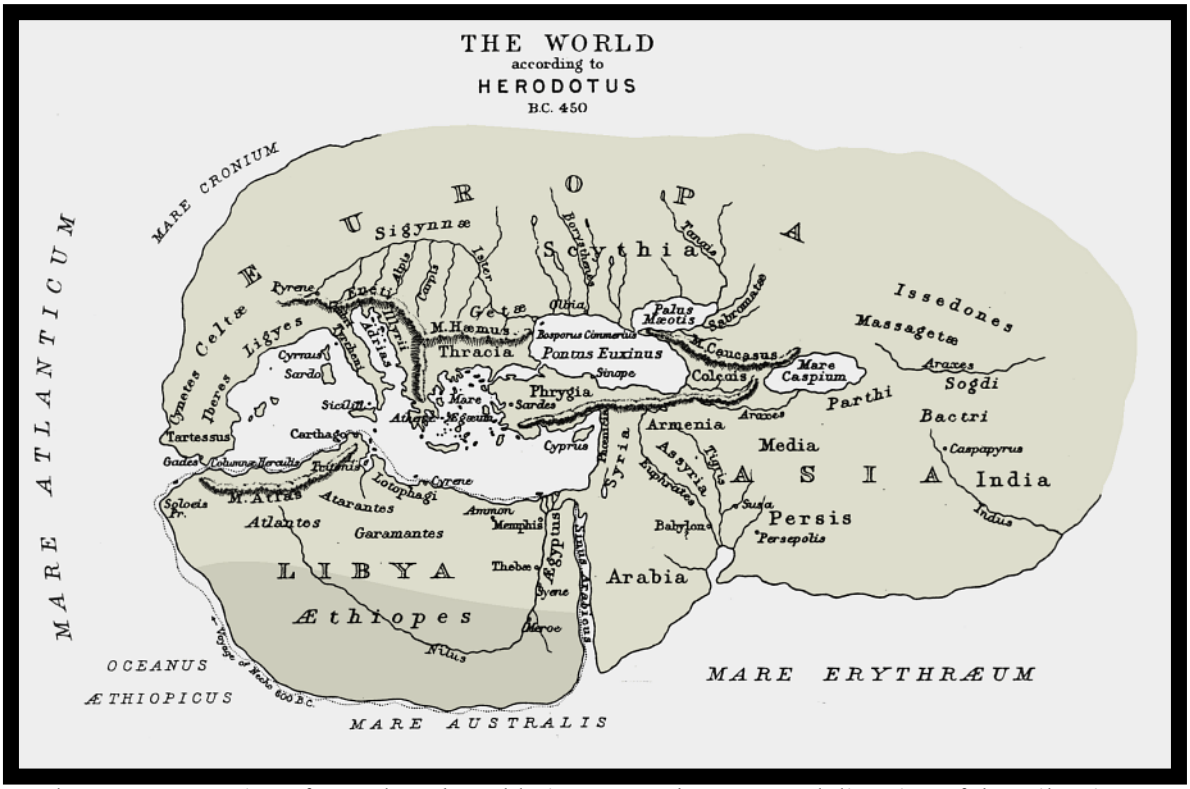
In the history of geographical (or terrestrial) mapping, the great practical step forward during this period was to locate the inhabited world exactly on the terrestrial globe. Eratosthenes was apparently the first to accomplish this, and his map was the earliest scientific attempt to give the different parts of the world represented on a plane surface approximately their true proportions. On his map, moreover, one could have distinguished the geometric shapes of the countries, and one could have used the map as a tool to estimate the distances between places.

*Herodotus' & Strabo's World Concept* ***(#109)***

Thus it was at various scales of mapping, from the purely local to the representation of the cosmos, that the Greeks of the *Hellenistic* Period enhanced and then disseminated a knowledge of maps. By so improving the mimesis or imitation of the world, founded on sound theoretical premises, they made other intellectual advances possible and helped to extend the Greek vision far beyond the Aegean. To Rome, Hellenistic Greece left a seminal cartographic heritage - one that, in the first instance at least, was barely challenged in the intellectual centers of Roman society.

The monographs describing the maps/mapmakers from the *Hellenistic* Period include:

- ***#109***, Herodotus' World Map (450 BCE)
- ***#110***, Ephorus' Parallelogram (350 BCE)
- ***#111***, Dicæarchus of Messana 's World Map, (300 BCE)
- ***#112***, Eratosthenes' World Map (240 BCE)




*Modern reconstruction of Herodotus' world view. Note the westward direction of the Nile River, the ambiguousness of northern Europe and that Libya is truncated at the equator and is surrounded by water with a note about the Phoenicians' circumnavigation.* ***#109***

Herodotus wrote his *Histories* in the mid-400's BCE His book was intended first and foremost as the story of the Greeks' long struggle with the Persian Empire, but Herodotus also included everything he has been able to find out about the geography, history, and peoples of the world. His work, with the map that can be reconstructed from his descriptions, provides our most detailed picture of the world known to the Greeks of the fifth century BCE

To improve mapmaking, Herodotus gave precedence to data derived from empirical accounts. For example, he accepts that the continent of *Libya* [Africa] is almost entirely surrounded by water, excepting the Isthmus of Suez, as proved by pharaoh Necho II's circumnavigation of Africa (ca. 600 BCE) using Phoenician sailors. However, given the lack of empirical evidence that the Ocean surrounds the contiguous landmasses of Europe, Libya, and Asia, he rejects this theory. Giving preeminence to data gleaned from exploration and travel, Herodotus attacks cartographers who utilized only geometry. His various criticisms imply a high, but repetitive, level of contemporary map production. Even if he did not use maps himself, his text can still be employed to produce an outline of the *oikoumene*. The framework is in place: there are limits to the extent of the world and boundaries between landmasses.

Not surprisingly Herodotus was very forthright in his advice for drawing maps. He declares, "In a few words I will make clear the size [of Asia and Europe] and in what manner each should be depicted." He starts with Persia, delimited by the Persian Gulf and Arabia to the south. From the Black Sea are two peninsulas separated by the *Phasis*

*River*: one arcs north to the Hellespont; the other extends south along the Red Sea to the Arabian Gulf and west to include Egypt and Libya. The Caspian Sea and the Araxes River delimit the extreme northeast, but east of India there is an uninhabitable desert whose topography is unknown. Libya is circumnavigable except where it borders Asia. But there is no certain knowledge of bodies of water delimiting northern Europe. Herodotus finds fault with cartographers for dividing Europe, Libya, and Asia into three roughly equal landmasses, "because the differences between them are great." He gives the length of *Libya* as 100,000 *stadia* and asserts that Europe is "as broad as Asia and Libya together." Altogether, with his preference for empirically derived data, he rejects the philosophical paradigm of cartography and aspires to some degree of topographical accuracy.

Like Homer, Herodotus includes cardinal directions and topographical landmarks: bounding Egypt beyond *Heliopolis*, for example, are the *Mountains of Arabia*, oriented north to south and the site of quarries for the building of pyramids. Unlike Homer, Herodotus indicates approximate distances between places: the port of the *Borysthenites* lies at the midpoint of the *Scythian* coast; across from the *Tanais River* dwell the *Sauromatae*, whose lands stretch northward from *Lake Maeotis* [the Sea of Azov] and can be crossed in fifteen days; at its widest, Egypt is traversable in two months, whether by camel or on foot we are not told. Some distances in Egypt are given with deceptive precision: the seacoast reaches 60 "ropes" *(schoinoi)*, or 3,600 *stadia*; the distance between the sea and the city of *Heliopolis* is reported as 1,500 *stadia*, only 15 *stadia* longer (he says) than the route between Athens and Olympia; and *Heliopolis* lies 4,860 *stadia* (81 *schoinoi*) up the Nile from Thebes, which is 6,120 *stadia* inland from the Red Sea. Nonetheless, despite his interest in geography and his unequivocal opinions regarding cartography, Herodotus utilized geography primarily to reinforce his presentation of history.

In the most advanced civilizations through the ancient period and the medieval period in Europe or in the Middle East, very little was known of either northern Europe, the Far East, or Africa south of the equator. In China and India, the geography of the west, including Africa, was virtually unknown.

Again, it should noted that the Greeks were not particularly interested in the uninhabited regions, or even inhabited regions that were very far away. Scattered throughout his text is so much information about countries and rivers and seas and their relative size and position that many have tried to draw maps of Herodotus' world from it. Herodotus writes:

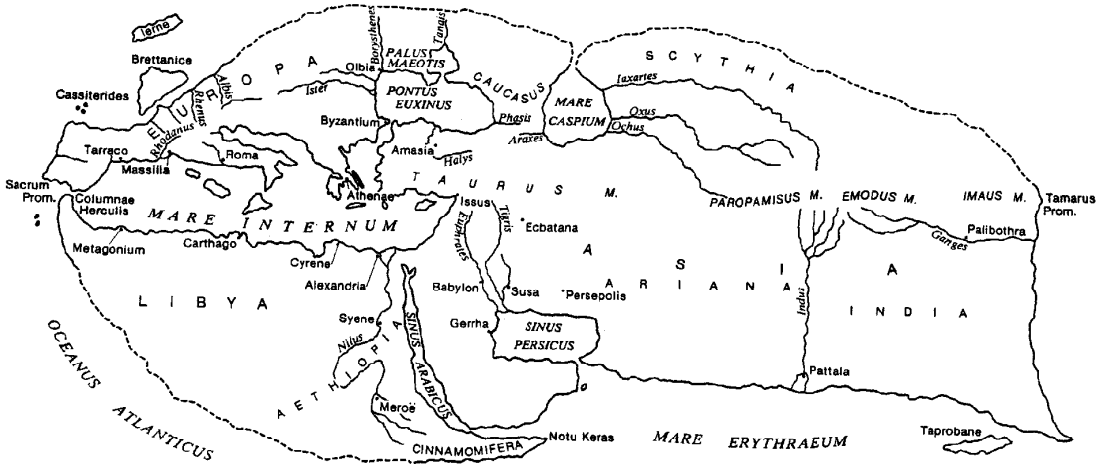
> And I laugh when I see that, though many before this have drawn maps of the Earth, yet no one has set the matter forth in an intelligent way; seeing that they draw Oceanus flowing around the Earth, which is circular exactly as if drawn with compasses, and they make Asia equal in size to Europe . . . I wonder then at those who have parted off and divided the world into Libya, Asia and Europe, since the difference between these is not small; for in length Europe extends along by both, while in breadth it is clear to me that it is beyond comparison larger; for Libya furnishes proofs about itself that it is surrounded by sea, except so much of it as borders upon Asia [Then follows the narrative of the Phoenician voyage around Libya, and further on the story of the voyage made by Scylax] . . . Thus Asia also, excepting the parts of it which are towards the rising sun, has been found to be similar to Libya [i.e. surrounded by sea]. As to Europe, however, it is clearly not known by any, either as regards the parts which are

> towards the rising sun or those towards the north, whether it be surrounded by sea . . .

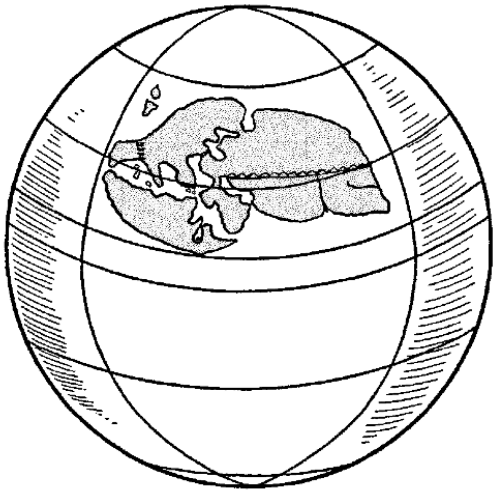
Of the areas to the north and east Herodotus knew little, mentioning neither Britain nor Scandinavia, and confessing ignorance of eastern Asia. He does not know whether Europe is surrounded by water to the west and north, nor the location of the *Cassiterides Islands* [Great Britain?], from which tin is obtained. In the geography of India, Herodotus made a surprising mistake. Although he knew that a Greek mariner called *Scylax* (dates unknown) had sailed down the Indus River and around Arabia into the Red Sea, Herodotus maintained that the Indus River flowed southeast. And as with most Europeans for the next 1,000 years, he knew little to nothing about Africa south of the equator. Popular thought was that the extreme heat at the equator prohibited passage and/or habitation within and beyond.

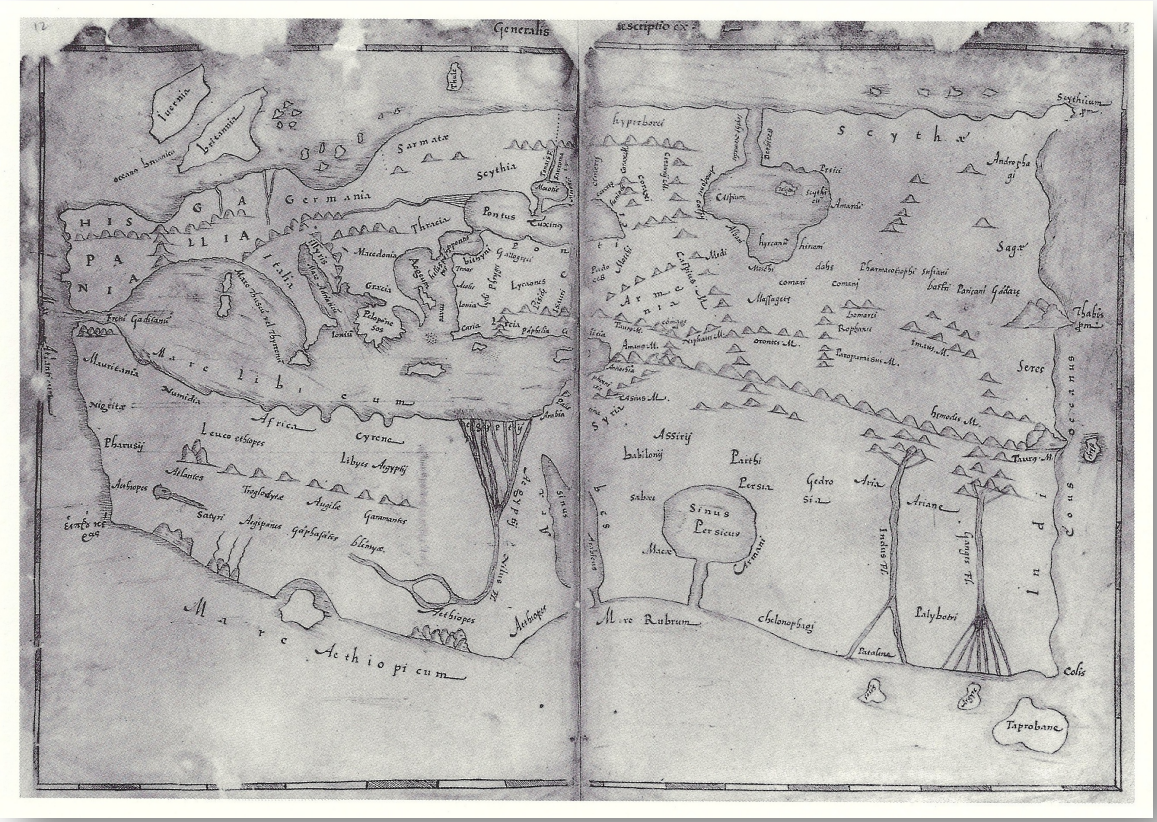
Herodotus (4.191) places a range of animal and human monsters in the distant western edge of Africa:

> It is here that huge snakes are found – and lions, elephants, bears, asps and horned asses, not to mention dog-headed men, headless men with eyes in their breasts (I don't vouch for this, but merely repeat what the Libyans say), wild men and wild women, and a great many other creatures of by no means a fabulous kind.




*Modern reconstruction of Strabo's world view, ca. 18 CE* ***#115***

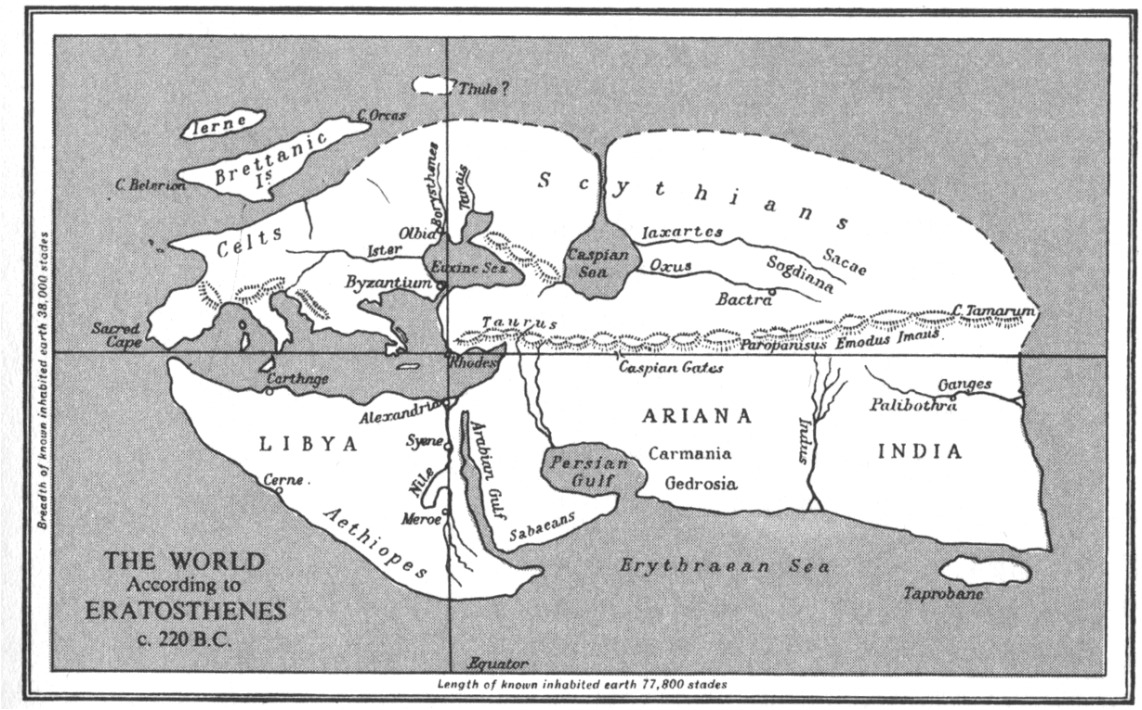





*A reconstructed map attributed to Strabo: Generalis…[Strabo?] descriptio, 1550*

5.11


*Modern reconstructions of a number of ancient Greek world concepts showing the oikoumene [known inhabited world]. Note that all of these concepts envision Libya [Africa] surrounded by water, except Ptolemy who envisioned a land bridge connecting Africa with Asia and enclosing the Indian Ocean and all of them truncate Africa near the equator.*




*A modern reconstruction of the world view of Eratosthenes* ***#112***

*Eratosthenes' World Concept* ***(#112)***

Eratosthenes' *oikoumene* resembled a cloak bound tight at the top (the north) and loose at the bottom (the south) with tapered ends in the east and west. Its northern boundary lay on the parallel of *Thule* (66° N), a legendary island, while its southern limit extended as far as the *Cinnamon* country (12° N), close to the mouth of the Red Sea, and a mysterious island of *Taprobane*, off the coast of India. His main meridian linked *Thule*, the Black Sea, Egypt, Ethiopia and the sources of the Nile River. His principal parallel of Rhodes at 36° N connected its western and eastern confines from the *Pillars of Hercules* to the eastern capes of India through the whole length of the Mediterranean Sea and via the lofty mountain ranges of Asia. It was stuck against an unknown location on the shoreline of the eastern ocean, between the delta of the Ganges River and the *Taurus* and *Imaus* (Himalaya) mountain ranges that cut Asia lengthwise. This imaginary partition line, that crossed the whole *oikoumene* cutting it into two fairly equal parts, covered the greatest east-west extent or the "length" of the inhabited world.

Eratosthenes was best known for his very accurate approximation of the overall size of the earth *(see monograph* ***#112****).* As approximations to sizes and shapes of parts of the world, Eratosthenes first divided the inhabited world by a line stretching from the *Pillars of Hercules* [Straits of Gibraltar] to the *Taurus Mountains* and beyond, then subdivided each of these two sections into a number of irregular shapes, or *sphragides*, which literally meant *'an official seal'* and later was extended to represent a plot of land numbered by a government surveyor, then by extrapolation to a numbered area on a map. India he suggested drawing as a *rhomboid*; *Ariana* [the eastern part of the Persian Empire] would be illustrated as approximating a parallelogram. We do not know the total number of *sphragides* and have shapes recorded only for some. *Taprobana Island*, a misplaced Ceylon/Sri Lanka, and the short-cutting of Africa and India in the south were

the result of the misconception that the equatorial waters were too hot to be navigated.

In the Eratosthenes' view, Africa was washed by the Atlantic and Indian Oceans, though circumnavigation of the "third continent" was out of the question due to the unbearable heat of the equatorial waters. He held the opinion that the earth included five climatic zones: two of them were inhabited (the moderate zones of the Northern and Southern Hemispheres) and three abandoned-on both sides of the equator and adjoining the poles.

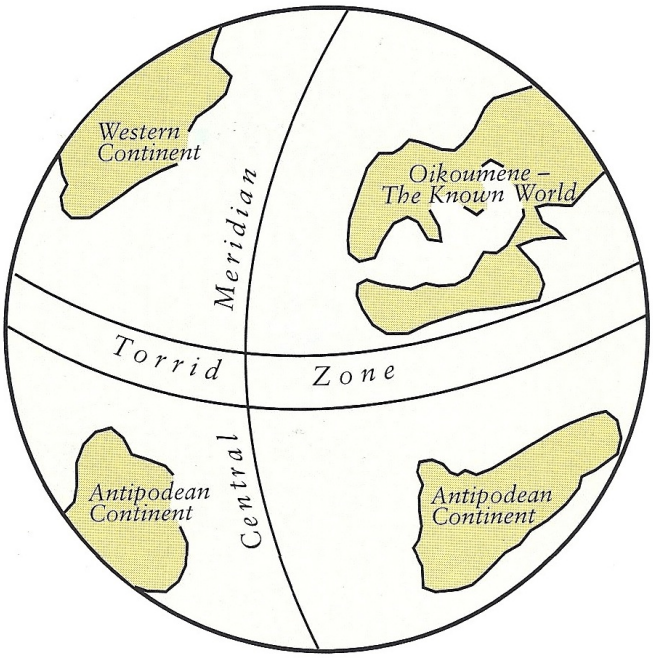
Eratosthenes also adopted, and apparently developed at considerable length, an idea first suggested by the physical philosopher Strabo, that the Mediterranean and the *Euxine* [Black] Seas had originally no outlet, and stood in consequence at a much higher level, but that they had burst the barriers that confined them, and thus given rise to the Straits of the Bosphorus, the Hellespont and that of the columns. In proof of this theory he alleged the presence of marine shells far inland in Libya, especially near the temple of Jupiter Ammon, and on the road leading to it, as well as the deposits and springs of salt that were also found in the Libyan deserts.

The Roman Republic offers a good case for continuing to treat the Greek contribution to mapping as a separate strand in the history of classical cartography. While there was a considerable blending and interdependence of Greek and Roman concepts and skills, the fundamental distinction between the often theoretical nature of the Greek contribution and the increasingly practical uses for maps devised by the Romans forms a familiar but satisfactory division for their respective cartographic influences. Certainly the political expansion of Rome, whose domination was rapidly extending over the Mediterranean, did not lead to an eclipse of Greek influence. It is true that after the death of Ptolemy III Euergetes in 221 BCE a decline in the cultural supremacy of Alexandria set in. Intellectual life moved to more energetic centers such as Pergamum, Rhodes, and above all Rome, but this promoted the diffusion and development of Greek knowledge about maps rather than its extinction. Indeed, we can see how the conditions of Roman expansion positively favored the growth and applications of cartography in both a theoretical and a practical sense. Not only had the known world been extended considerably through the Roman conquests - so that new empirical knowledge had to be adjusted to existing theories and maps - but Roman society offered a new educational market for the cartographic knowledge codified by the Greeks. Many influential Romans both in the Republic and in the early Empire, from emperors downward, were enthusiastic Philhellenes and were patrons of Greek philosophers and scholars. Throughout the second and first centuries B.C. and beyond, it was thus men of Greek birth and education - such as Polybius, Crates of Mallos, Hipparchus, and Strabo - who continued to make fundamental contributions to the development of scientific mapping and who provided a continuous link with these activities in the Hellenistic world and their culmination in the later syntheses of Claudius Ptolemy.

The extent to which a new generation of scholars in the second century B.C. was familiar with the texts, maps, and globes of the *Hellenistic* Period is a clear pointer to an uninterrupted continuity of cartographic knowledge. Such knowledge, relating to both terrestrial and celestial mapping, had been transmitted through a succession of well-defined master-pupil relationships, and the preservation of texts and three-dimensional models had been aided by the growth of libraries. Yet this evidence should not be interpreted to suggest that the Greek contribution to cartography in the early Roman world was merely a passive recital of the substance of earlier advances. On the contrary,

a principal characteristic of the new age was the extent to which it was openly critical of earlier attempts at mapping. The main texts, whether surviving or whether lost and known only through later writers, were strongly revisionist in their line of argument, so that the historian of cartography has to isolate the substantial challenge to earlier theories and frequently their reformulation of new maps. The monographs describing the maps/mapmakers from the *Early Greco-Roman Period* include:

- ***#113***, Crates' Globe (180 BCE)
- ***#114***, Posidonius' World Map (150 BCE)
- ***#115***, Strabo's World Map (18 CE)
- ***#116***, Pomponius Mela's World Map (37 CE)




*Crates' World Concept predicting the existence of the Western Hemisphere* ***#113***

It seems to have been Crates' idea that the earth's surface, when represented on a sphere as shown above, 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*, and that of the *Antoecians* in corresponding longitude and in opposite latitude; on the other hemisphere lies the *oikoumene* of the *Perioecians* in our latitude and in opposite longitude, and that of the *Antipodes* in latitude and longitude opposite to us. Through the formulation and expression of such a theory the existence of an antipodal people was put forth as a speculative problem, an idea frequently discussed in the Middle Ages, and settled only by the actual discovery of antipodal regions and antipodal peoples in the day of great transoceanic discoveries of the 17th and 18th centuries.

It was thought that Africa did not extend to the equator, or at least was not habitable to the equator. Below the equator there was thought to be water but beyond

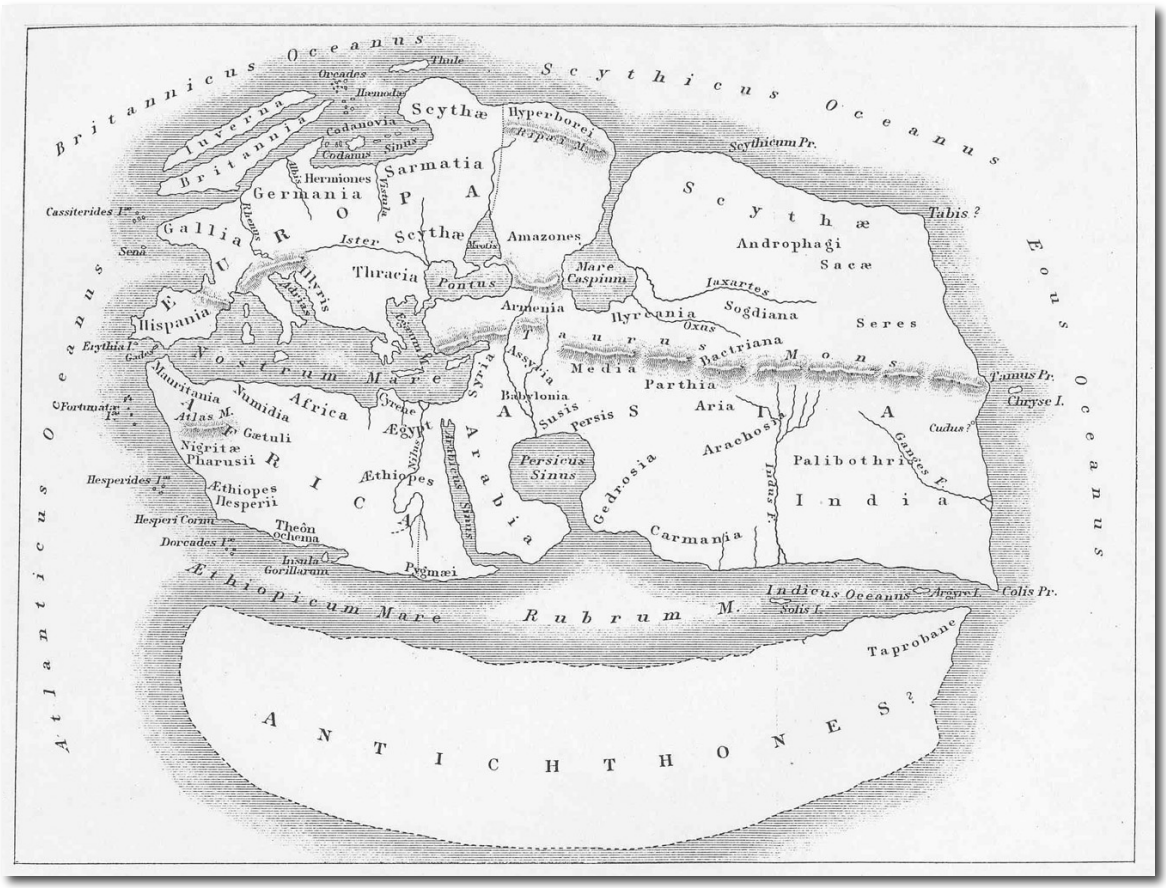
the uninhabitable and impassable Torrid Zone, a habitable region existed. The map of Lambertus *(see monograph* ***#217****)* well represents this early theory. Pomponius Mela ***(#116*** *below)* called the inhabitants of this southern region *Antichthoni*, their country being unknown to us because of the Torrid Zone intervening. Pliny, and after him Solinus, says that for a long time the island of *Taprobana* [Ceylon/Sri Lanka] was thought to be the region occupied by the *Antichthoni*.

Crates' motive for his cartography was partly literary, interpreting Ulysses' wanderings, and partly historical, rather than purely scientific. As a Stoic, he proclaimed Homer the founder of geography, crediting him with belief in a spherical earth and commenting on his poems accordingly. To explain Homer's line, "The Ethiopians who dwell sundered in twain, the farthermost of men", Crates argued that on each side of an equatorial ocean there lived the Ethiopians, divided by the ocean, one group in the Northern Hemisphere, the other group in the Southern, without any interchange between them. Again Strabo reports:

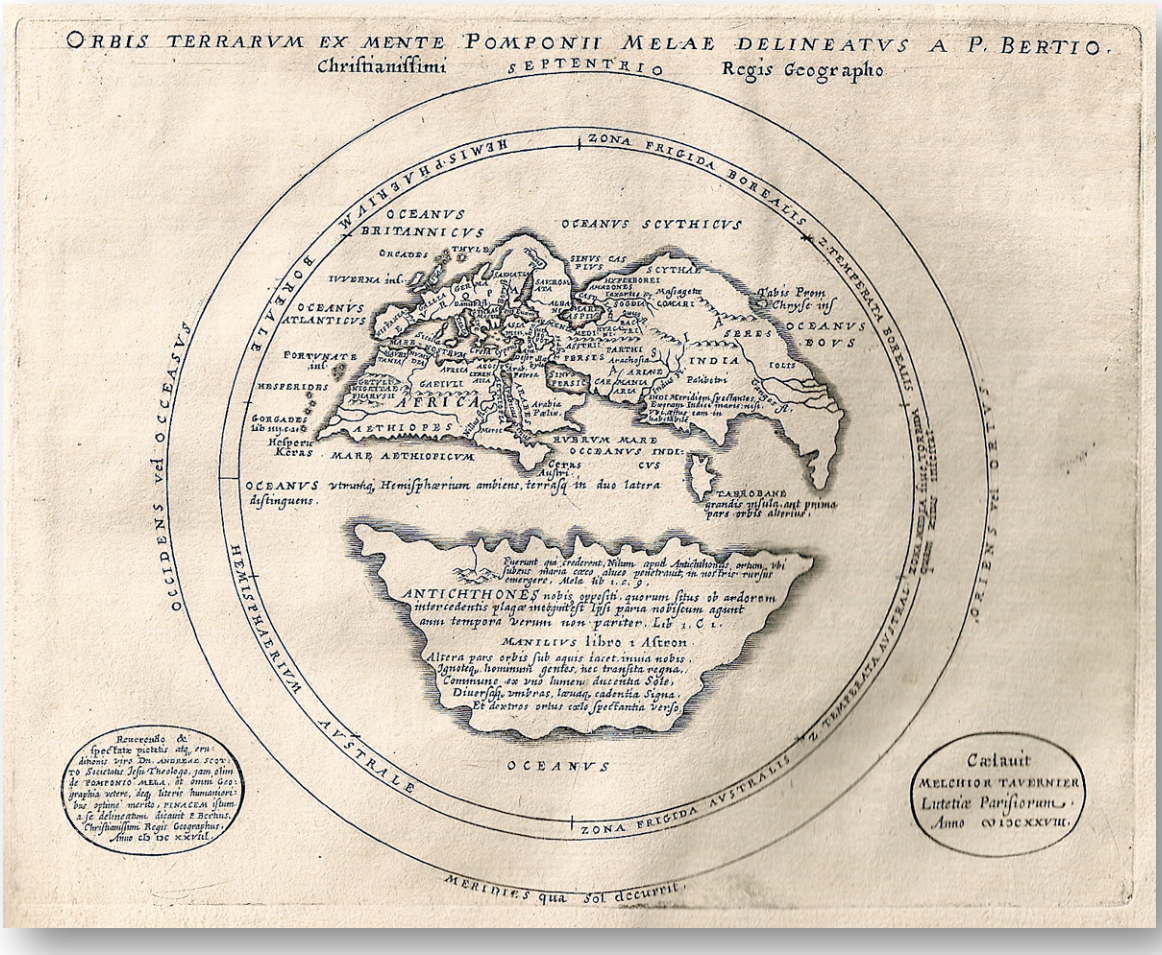
> Crates, following the mere form of mathematical demonstration, says that the torrid zone is "occupied" by Oceanus, and that on both sides of this zone are the temperate zones, the one being on our side, while the other is on the opposite side of it. Now, just as these Ethiopians on our side of Oceanus, who face the south throughout the whole length of the inhabited world, are called the most remote of the one group of peoples, since they dwell on the shores of Oceanus, so too, Crates thinks, we must conceive that on the other side of Oceanus also there are Ethiopians, the most remote of the other group of peoples in the temperate zone, since they dwell on the shores of this same Oceanus.

The scientific thinking behind the geography of Crates' globe was derived directly from the teaching of Eratosthenes about the relative size of the known world. By combining the geometric approach of his predecessor with his own interpretation of Homer, he represented four inhabited worlds on the surface of his terrestrial globe. Two were in the Northern Hemisphere, the one where the Greeks lived, occupying far less than half of the Northern Hemisphere, and another symmetrically situated in the other half. Two other inhabited worlds are found in the Southern Hemisphere, symmetrical with the two north of the equator. These four worlds were separated by oceans along the equator (occupying the Torrid Zone made uninhabitable by heat) and along a meridian. The inhabited areas were thus islands, with no communication between them.

A belief in the existence of antipodal peoples, very clearly was also accepted by Pythagoras, Eratosthenes, Posidonius, Aristotle, Strabo, and later Capella.




*Modern reconstruction of Pomponius Mela's World View* ***#116***
*Here a truncated Africa is shown surrounded by the ocean and a "gap" [near the equator or the Torrid Zone] and another large landmass below in the southern Temperate Zone. This climatic zonal approach will be carried on and expanded during the early medieval period in Europe, especially with Macrobius-inspired mappaemundi (see monograph* ***#201****)*




*Reconstruction of Pomponius Mela's World View, 1628, Petrus Bertius in his* Orbis Terrarum Pomponius Melæ Delinætus P. Bertius. ***#116***

*Pomponius Mela's World Concept, 37 CE,* ***#116***

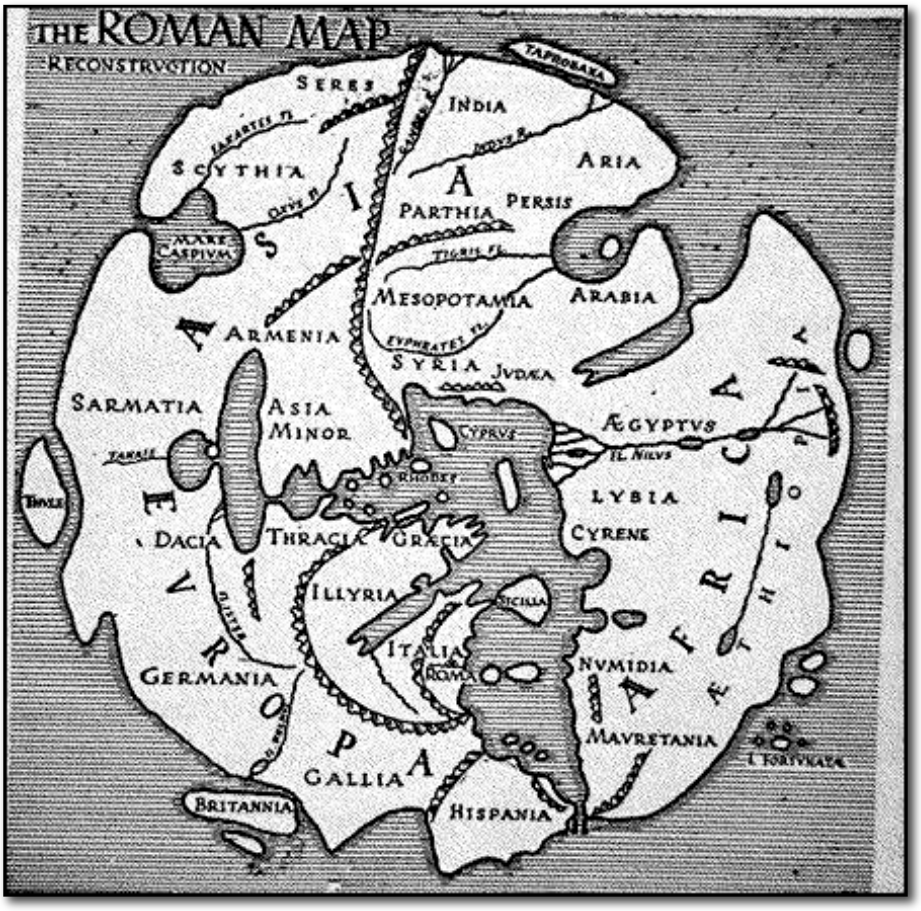
The two images above show modern attempts at reconstruction of the world view of the earliest Roman geographer Pomponius Mela (first century CE), who, although of Spanish birth, wrote a brief work which agrees in most of its views with the great Greek writers from Eratosthenes *(**#112**)* to Strabo *(**#115**)*. However, 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 at the equator. 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]; even Pliny quoted Mela as an authority.

Mela's very simple and popular writings were entitled *Chorographia*, which means "regional geography" and covers the whole world region by region. It was written in Latin in three books under Gaius or Claudius; there is, however, no evidence that it contained any maps. According to Mela the world can be divided east and west into what he calls "two hemispheres". This is not a scientific definition, but a rough division of the known world approximating to Asia on the east and Europe and Africa

on the west. From north to south he divided it into five "climatic zones": two cold, two temperate and one hot. This is a different approach from that offered by Strabo who chose to ignore, as virtually uninhabitable, everything south of the latitude of southern India. It does correspond, however, to the division in Eratosthenes' lost poem *Hermes*, paraphrased by Virgil, which regards the equatorial zone as 'altogether burnt up', but says that *Antipodes* live in the southern temperate zone. This climatic zonal approach will be carried on and expanded during the early medieval period in Europe, especially with Macrobius-inspired *mappaemundi (see monograph* ***#201****).*

Mela's concept of Africa is less developed than those of later authors such as the elder Pliny, but he does summarize Hanno's *Periplus*. He came from Gibraltar, yet he believed there were no inhabitants of the central part of western Mauritania. His contribution to the disputed topography of *Tartessus* (*Tarshish* in the Old Testament) is to tell us that some thought that it was on the site of *Carteia*, near *Algeciras*. This is the kind of information that could have been entered in notes accompanying a map rather than on a map itself.

The *Age of Ptolemy* Period begins with a short description of Roman cartographic efforts. The profound difference between the Roman and the Greek mind is illustrated with peculiar clarity in their maps. The Romans were indifferent to mathematical geography, with its system of latitudes and longitudes, its astronomical measurements, and its problem of projections. What they wanted was a practical map to be used for military and administrative purposes. Disregarding the elaborate projections of the Greeks, they reverted to the old disk map of the Ionian geographers as being better adapted to their purposes. Within this round frame the Roman cartographers placed the *Orbis Terrarum*, the Circuit of the World, around 20 CE.




*Marcus Vipsanius Agrippa's World Map, 20A.D./CE,* ***#118***

Above is a modern reconstruction of the Roman *Orbis Terrarum*, from E. Raisz *(see monograph* ***#118****)*. 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. According to a theory put forth by Doug Fisher *(see reconstruction below, AtlantisMaps.com)* concerning the depiction of Africa, Agrippa's *Orbis Terrarum* are presents the Roman belief that the Nile River originated in the mountains of Mauritania and ran laterally across the continent dividing the African continent in two with Libya to the north and Ethiopia to the south. . The North African coast has four sections, Mauretania, Numidia, Cyrenaica and Lower Egypt. All of these equally peter off into the unknown south.

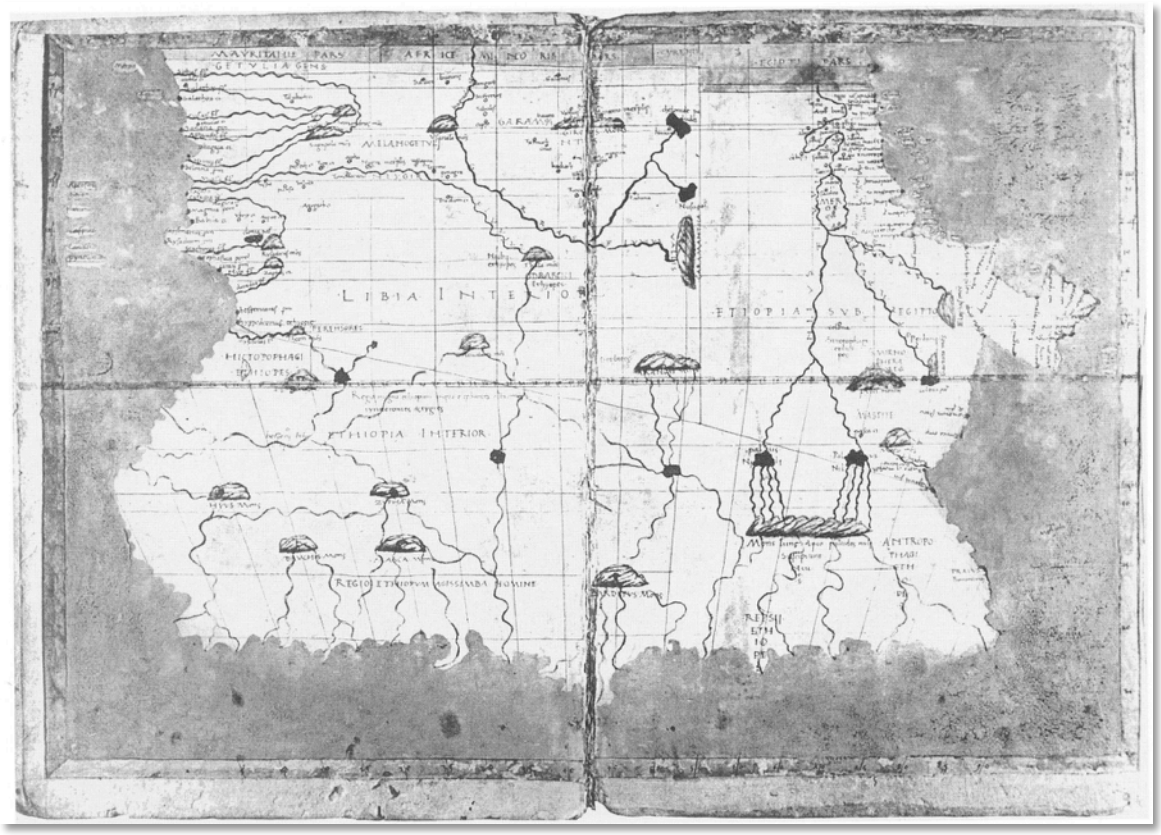
5.11


The only reported Roman world map before Agrippa's was the one that Julius Caesar commissioned but never lived to see completed. We are told by late Roman and medieval sources that he employed four Greeks, who started work on the map in 44 BCE These were no doubt freedmen, of whom there were large numbers in Rome, including many skilled artisans. The four regions of the world are not self-explanatory, but what Caesar seems to have meant is as follows: the East (by the cartographer Nicodemus), included everything to the east of Asia Minor; the West (by Didymus), included Europe except Greece, Macedonia and Thrace; the North (by Theodotus), included Greece, Macedonia, Thrace and Asia Minor; and the South (by Polyclitus),

included all of Africa. If Romans were planning this, they would place the northern section much further west, whereas the cartographers were Greeks, and they followed a tradition which originated in Rhodes or Alexandria.

*Claudius Ptolemy's World Concept, 168 CE,* ***#119***

By the time of Marinus of Tyre (fl. 100 CE) and Claudius Ptolemy (ca. 90-168 CE), Greek and Roman influences in cartography had been fused to a considerable extent into one tradition. There is a case, accordingly, for treating them as a history of one already unified stream of thought and practice. Here, however, though such a unity existed, the discussion is focused primarily on the cartographic contributions of Claudius Ptolemy, writing in Greek within the institutions of Roman society. Ptolemy owed much to Roman sources of information and to the extension of geographical knowledge under this growing empire: yet he represents a culmination as well as a final synthesis of the scientific tradition in Greek cartography.




*Ptolemy-Wilczek Brown (c. 1450).*
*John Carter Brown Library, Brown University, Providence, Rhode Island.*

Above is a picture of the earliest printed map of the whole of Africa. It is a woodcut map without title which can be found at the first opening of a rare book entitled *Itinerarium Portugallensium e Lusitania in Indiam*, published in Milan in 1508. The map is in the Ptolemaic mould, that is, the outline of the continent and the depiction of the interior accord with the late medieval reconstructions of the work of Claudius Ptolemy, who lived on the north shores of the African continent during the second century AD, at a

time when Greek theory and Roman practice came together to produce remarkable advances in cartography, including the depiction of Africa.

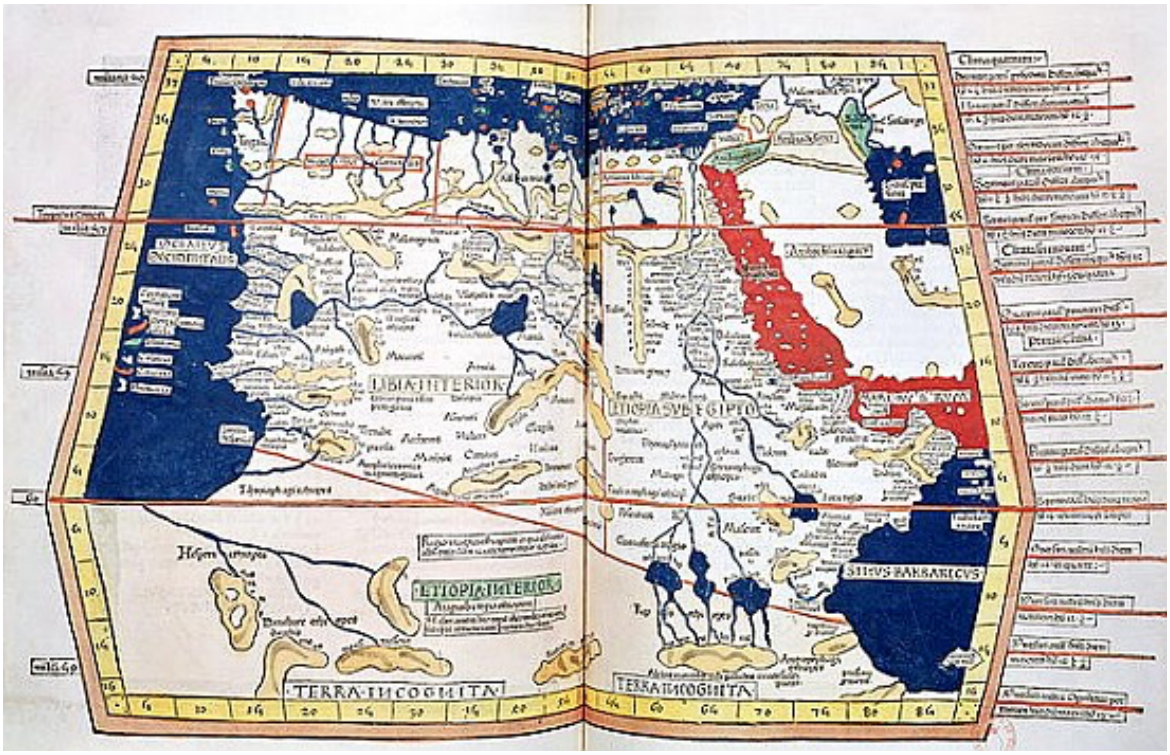
Ptolemy was the heir to centuries of Greco-Roman discourse about Africa, going back to about 440 BCE and to Herodotus, who is a prime source in the controversy over the supposed circumnavigation of Africa by Phoenicians as early as 600 BCE. The significance of any such voyage is, of course, that it would have demonstrated that Africa is a peninsula, delimiting but not separating the eastern and western parts of the great southern ocean, an important realization in describing the shape of the continent. This was the view of Africa carried forward successively, with additional information by Eratosthenes, Strabo, Mela and Pliny, although it may have been Ptolemy who disseminated a different depiction of southern Africa, in the form of an eastward extension of the southern-most part of the continent, almost enclosing the Indian Ocean. Alternatively, this may derive from later Arab sources.

Ptolemy's more enduring legacy, which is apparent in the printed map of 1508, is his depiction of the headwaters of the Nile. There are several schools of thought in Greek and Roman writing about the source of the Nile, and Ptolemy may have chosen to rely on the account by Marinus of Tyre or the Greek trader Diogenes, who is said to have landed on the coast of East Africa in about 50 CE, where he learned that the source of the Nile lay in the lakes of East Africa. Ptolemy depicted the Nile as rising south of the Equator, from two lakes that are fed in turn by the streams from the Mountains of the Moon. This has given rise to further debate about whether the Mountains in fact represent the mountains of Ethiopia, substantially misplaced, but in reality, the source of the Blue Nile.

Herodotus seemed to favor an alternative source of the Nile, far to the west in sub-Saharan West Africa, and his interpretation is the origin of a second inland feature that was carried forward from Greek scholarship, namely, a major river aligned latitudinally across West Africa. However, Ptolemy's source of the Nile allowed the retention of this river, but he reversed its direction and showed it as flowing westward into the Atlantic Ocean. This was an error that is apparent on the printed map of 1508 and which persisted into the 19th century.

But we need not trace in detail the extension of the map of Africa from one geographer to another. Claudius Ptolemy, the famous Alexandrian astronomer. who flourished about 140 years after Christ, may be regarded as summing up all the knowledge of the African continent that had accumulated since Egypt began her career 4,000 years at least before his time. About 170 years before Ptolemy’s time (35 BCE) Egypt had become a Roman province, Carthage having succumbed to the all-conquering power over 100 years before that. The Greeks, and after them the Romans, were therefore the first European power to obtain an extensive footing in Africa: but, after all, it was only along its northern borders. The whole of North Africa became a part of the Roman Empire, while the Phoenician and Carthaginian settlements on the west coast appear rapidly to have decayed or lapsed into barbarism. The Punic Wars and the travels of Polybius in the early part of the second century B.C. extended the knowledge of Africa to the south of the Mediterranean; Polybius, indeed, who had voyaged for 600 miles down the African west coast, considerably extended the area of the continent to the south, and had abandoned the circumambient ocean of Hecataeus. Before Ptolemy’s time traders and navigators had pushed round Cape Guardafui and we know from the *Periplus of the Eritrean Sea* that there were many towns and trading centers at least as far south as the latitude of Zanzibar, if not farther. This *Periplus*, which dates some sixty

years before Ptolemy, is a great storehouse of information as to the extent to which East Africa was known, and the nature of the trade that was carried on. The *Periplus* was a sort of navigation guide or directory to the coasts of the Red Sea, and of Africa from the Straits of Babelmandeb down to about the latitude of Zanzibar. Probably it was not very long before the date of the *Periplus* that the Egyptians had rounded the Cape Guardafui, and the towns they found on the coast were in all likelihood inhabited not by aboriginal Africans, but by Arab and Indian settlers from the opposite coast of Asia. But it is evident that early in the Christian era traders from Egypt, starting from Red Sea ports, sailed round by Cape Guardafui, and, calling at many ports on the way, went far down the east coast, probably as far as the mouth of the Zambesi River.

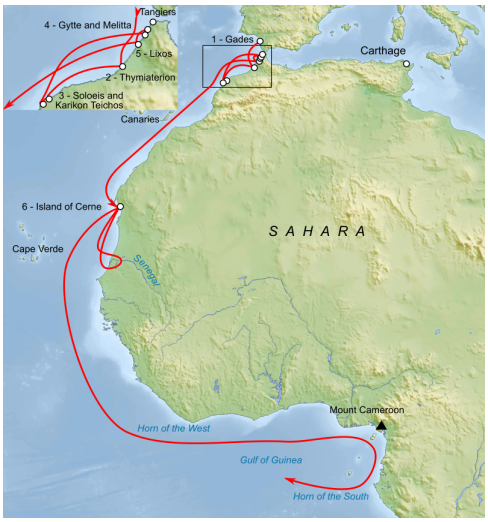



*Africa as depicted in the 1486 Ulm edition of Ptolemy' Geographike by Nicolaus Germanus on a trapezoidal projection*

Ptolemy himself was no traveler. He was, in truth what is sometimes called an "armchair geographer". He not only availed himself or the knowledge accumulated by previous geographers, but collected itineraries from traders and travelers from all parts of the world. These, unfortunately, he did not record verbatim. He tabulated their results, so to speak, and plotted them on maps. His distances are often very inaccurate; his statements inconsistent with what we know to be the facts, and often unintelligib1e; but when all allowance is made, it will be seen that during the 600 or 700 years that had elapsed since the time of Herodotus, the knowledge of the world generally and of Africa in particular, had advanced considerably; in the case of Africa, however, mainly along the coast and up the Nile.

Let us recall the fact that in the meantime Egyptians, Carthaginians, and the Greeks in Africa had all become subject to Roman influence. The world had grown, and

civilization had extended, and with it, no doubt, trade had expanded. Along the Mediterranean and Red Sea shores of Africa and down by the shores of the Indian Ocean traders and navigators were busy; but the old settlements down the west coast seem to have been abandoned. On the north we have no record of any expeditions across the Sahara. While there was constant fighting between native tribes and Roman troops, and border warfare frequently enough, effective occupation, except at certain points, hardly extended beyond the coast region, and the lower slopes of the Atlas Mountains westwards.




We do read of an expedition in the reign of Nero about 60 CE, an expedition led by Hanno the Navigator, too, which had for its objective a search for the sources of the Nile (illustrated on the right). The expedition was under the charge of a military officer, and was of small dimensions. From the description which these early explorers brought back of immense marshes, and of a river so choked up by vegetation as to be impassable, it has been thought by the best authorities that they may really have reached the region above the Sobat on the White Nile, about nine degrees north latitude. This, then, probably gives us the limit of exploration in the African interior from the north, and of precise knowledge of that interior until the time when the proselytizing Moslems made their way across the Sahara.

Ptolemy, no doubt, in constructing his maps had at his command this as well as other information. He, it should be remembered, was a citizen of Alexandria, the city founded by Alexander 400 years before Ptolemy's time, and at that date one of the greatest seaports of the world. It was the center of all African trade, the resort of skippers and travelers from all parts of the coast of North Africa, from whom and from all other available sources, evidently Ptolemy made a point of gathering information. Yet he does not seem to have known the *Periplus of the Eritrean Sea*. Egyptian traders had evidently found their way round the Horn of Africa in the early years of the first century. What, then, can we learn from the map of Ptolemy as to the knowledge of Africa possessed in the second century of our era by the Romans and those whose knowledge and possessions they had inherited?

Of the Mediterranean coast we may say they had a very complete knowledge, though their conception of its contour and extent was far from being accurate. Down the west coast trading stations still existed for some distance, though many of the old Phoenician and Carthaginian settlements had been abandoned, and no effective occupation had ever been made to the limit of Hanno's journey. The Red Sea coast was also well known and a regular traffic had been established along the Somali coast east and south, probably as far as the mouth of the Zambesi River. But outside the Red Sea very hazy notions existed as to the character and trend of the African coast, so that we cannot say that the knowledge of it was anything but vague. In the interior we may conclude that the Nile Valley was well known as far as Meroe in the time of Ptolemy, and even the Abyssinian branches of the river. Beyond Meroe information of a somewhat vague kind existed as to the river as far as the Bahr Ghazal, and perhaps a

little beyond. That from this direction any knowledge of the sources of the Nile, of the great equatorial lakes, and the snowy peaks around them, had reached the Egyptians, and through them the Greeks and Romans, we have no shadow of evidence. It is improbable. But Ptolemy's maps, as they have reached us, do show the Nile issuing from two lakes, with feeders flowing from the *Mountains of the Moon*. What did this mean? Had Ptolemy really obtained certain information from some traveling traders as to these lakes and mountains? Had he only heard of the lakes and mountains of *Abyssinia*, and the feeders that issue there from? And did he or his successors project these down the continent as knowledge of Africa extended? Volumes have been written on both sides, and men of the highest standing are found taking opposite views. There is this to be remembered, that a busy trade was carried on from a center called *Rhapta* (coastal city in present-day Tanzania), on the coast of the mainland somewhere near Zanzibar. That the traders at *Rhapta* and other centers had means of communication with the interior we cannot doubt. The Arabs, Persians, Indians, Egyptians, or whatever race the foreign traders belonged to, may not have penetrated Central Africa themselves, but trading caravans, manned by natives in all probability, came and went and in this way knowledge of the central lakes may have filtered down to the coast. Ptolemy compiled his geography of Africa based on the writings of Marinus of Tyre. Marinus recorded that around 50 CE the Greek trader Diogenes traveled inland from *Rhapta* for 25 days before encountering two great lakes and a snowy range of mountains where the Nile draws its source. Though there is some debate on this subject, it seems very clear that Diogenes, traveling directly west from the coast, came upon either Lake Nyassa or Lake Victoria (or both). The nearby snowcapped mountains could only be the Rwenzori range. Others have suggested that Diogenes may have spotted Mount Kilimanjaro, however, this is unlikely given the absence of a major lake in the region as well as that that Diogenes described a range rather than a solitary mountain. In any case, via Marinus's writings, the travels of the Greek merchant Diogenes found their way into to Ptolemy's canonical *Geographica* and we see the first appearance of the *Mountains of the Moon.*

With such a provocative name, the *Mountains of the Moon*, one must wonder from whence it was derived. There is some speculation (in fact the only we've come across) that this is a transliteration into Greek of the Amharic name for the mountains near Lake Tana at the source of the Blue Nile, called to this day, the Simians. In Amharic, "Simian Mountains" translates as "Northern Mountains". However, a liberal transliteration of the word "Simian" into Greek might come up with *Selene* – the Moon Goddess.

How, one wonders, did the Simian Mountains get confused with the Rwenzori Mountains thousands of miles away? One must remember that Ptolemy was piecing together very sparse second and third hand accounts of merchant voyages, military campaigns, ancient Egyptian records, etc. The southernmost inland city in Africa in Ptolemy's *Geography* is Axum in Ethiopia. Lake Tana and the Simien Mountains were still a significant distance further south. Nor are Ptolemy's coordinates necessarily accurate with regard to latitude. Nor would Ptolemy, more familiar with the great mountain ranges of Europe and Asia, have been familiar with the small but dramatic mountain ranges of Africa. It is not hard to imagine how, from this perspective, two mountain ranges, relatively close, both associated with lakes, and both associated with the source of the Nile, might be assumed to be one and the same. It is thus likely the he simply applied the known name, *Simian-Selene*, to all mountains associated with the Nile's source.

In the fourth century CE, Ethiopia converted to Coptic Christianity. From this critical point onward, regular communication between the Ethiopian Orthodox church and the Coptic centers in Egypt provided the first accurate maps of Ethiopia. Consequently, by the time cartographers in the Middle Ages began translating Ptolemy's surviving texts and interpreting them into maps, the source of the Blue Nile was known. Though Ptolemy does not specifically note the presence of Lake Tana, it is mapped in even the earliest medieval interpretations of Ptolemy's work. Thus by the time the first European maps of Africa were being drawn, the mystery of the Blue Nile's source been solved.

Which left the more mysterious White Nile. Drawing from Ptolemy, cartographers repositioned the *Mountains of the Moon* and their lakes further south – where they remained until the 19th century. In the late 18th century many cartographers, including such luminaries as Anville and De L'Isle, chose to remove either the *Mountains of the Moon*, the Lakes of the Nile, or both from their maps of the region. It was not until the exploration of John Speke and Henry Morton Stanley in the mid 19th century until these lakes ultimately reappeared and Ptolemy's not so apocryphal geography of the Nile was proven eerily correct.

The Arab traders from Zanzibar and Mambasa saw these or heard of them. These Ptolemaic lakes, however, remained on the maps with the *Mountains of the Moon*, extended until they crossed the continent down even to the 19th century. Ptolemy's geography was the geography of Central Africa down to beyond the time of the Portuguese, with the few additions that the Moslem conquerors were able to make.

*Abyssinia* but imperfectly known, though Axum was a great trade center. In Lower Egypt the region between the Nile and the Red Sea was fairly well known, elsewhere probably little was known beyond certain trade routes: the routes, for example, from Thebes to Berenice. There were other routes from Thebes up the Nile, and also direct across Nubia to Meroe; thence the merchants went on by Axum to Adulis (Massawa), and also to Assab. Of course between Thebes and Memphis and Alexandria there would be constant traffic. Another trade route went from Thebes round by the oases of Siwa and Aujila to the country of the *Garamantes*, Fezzan in present-day southern Libya, and thence north to the coast of the Syrtes. Was there any direct connection in Ptolemy's time between North Africa, say Cyrene or Utica, and the countries to the south of the Sahara? This may very well be doubted: though that there was indirect trade from tribe-to-tribe from the central Sudan may very probably have been the case. With so many ports along the Mediterranean, along the Red Sea, and even well down the east coast, there must have been considerable trade with the interior, but we have no means of ascertaining its precise nature and extent. Down, then, to Ptolemy's time such partition of Africa had been affected by European powers scarcely extended beyond the coasts.

The remarkable influence of Ptolemy on the development of European, Arabic, and ultimately world cartography can hardly be denied. Through both the *Mathematical Syntaxis* (a treatise on mathematics and astronomy in thirteen books, also called the *Almagest* and the *Geography* (in eight books), it can be said that Ptolemy tended to dominate both astronomy and geography, and hence their cartographic manifestations, for over fourteen centuries. It is true that during the period from the second century CE to the early 15th century Ptolemy's geographical writings exerted relatively little influence on Western (European) cartography, though they were known to Arab astronomers and geographers. The *Almagest*, although translated into Latin by Gerard of Cremona in the 12th century CE, appears to have had little direct influence on the

development of cartography. With translation of the text of the *Geography* into Latin in the early 15th century, however, the influence of Ptolemy was to structure European cartography directly for over a century. In the history of the transmission of cartographic ideas it is indeed his work, straddling the European Middle Ages, that provides the strongest link in the chain between the knowledge of mapping in the ancient and early modem worlds.

Notwithstanding his immense importance in the study of the history of cartography, Ptolemy remains in many respects a complicated figure to assess. Many questions about his work remain unanswered. Little is known about Ptolemy the man, and neither his birthplace nor his dates have been positively established. Moreover, in relation to the cartographic component in his writings, we must remember that no manuscript earlier than the 12th century CE has come down to us, and there is no adequate modern translation and critical edition of the *Geography*. Perhaps most serious of all for the student of mapping, however is the whole debate about the authorship and provenance of the general and regional maps that accompany the several versions of the Byzantine manuscripts.

In the map shown above we can also see that the south of Africa is connected to Asia via an unknown continent or "land bridge", while the Indian Ocean is portrayed as an inland sea. The area south along the west coast of Africa was thought to include a dangerous stretch of ocean that was home to lurking monsters and boiling waters among other things, and prior to the 16th century Age of Discovery there were no navigators capable of overcoming their fears and leading their vessels into this region. In the 15th century, however, developments in the art of navigation and shipbuilding techniques made extended voyages a possibility, and Prince Henry of Portugal, who later became known as Henry the Navigator, began making plans for a voyage to explore the south of Africa. Over a period of some 40 years, Henry's navigators undertook a series of voyages into these perilous waters, edging further south on each occasion. Eventually, in 1488, nearly 30 years after the death of Henry the Navigator, the Portuguese navigator Bartolomeu Dias reached the southernmost point of Africa. John II, the king of Portugal at the time, named the headland discovered by Dias the Cape of Good Hope.

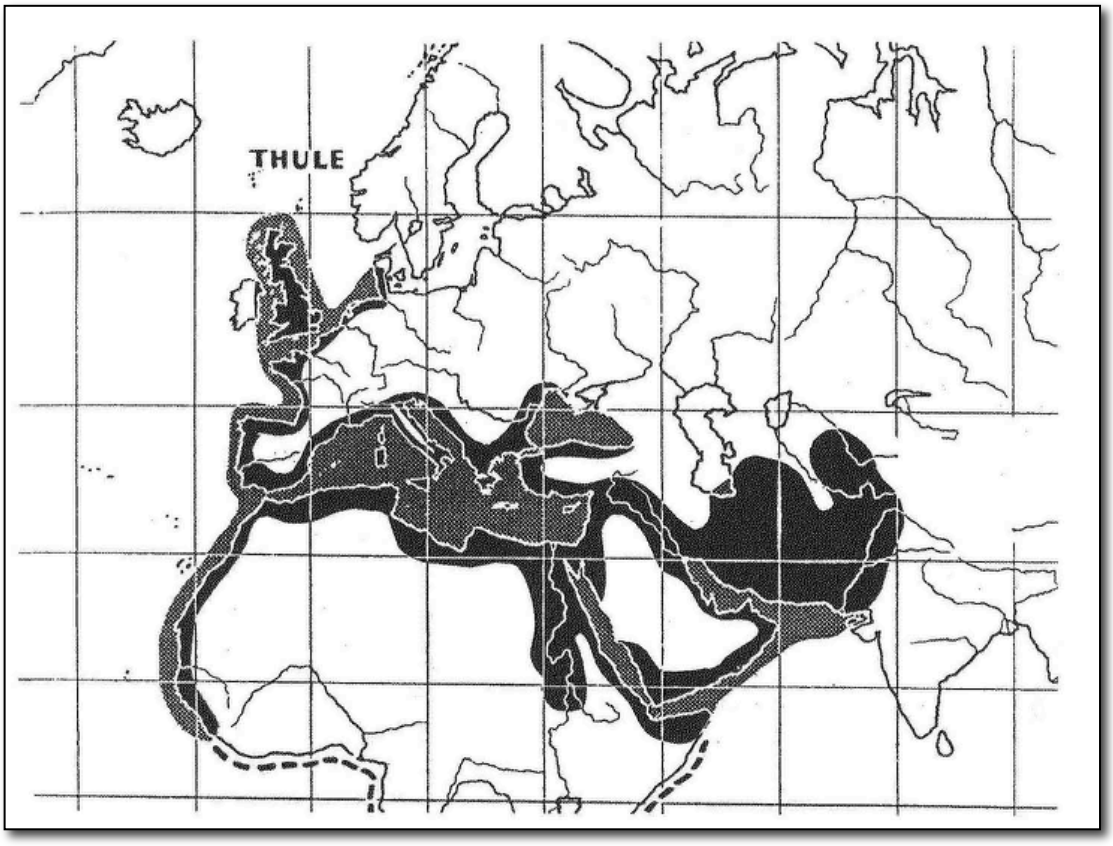
Still the culmination of Greek cartographic thought is seen in the work of Claudius Ptolemy, who worked within the framework of the early Roman Empire. A modern analysis of Ptolemaic scholarship offers nothing to revise the long-held consensus that he is a key figure in the long-term development of scientific mapping. Yet Ptolemy, as much through the accidental survival and transmission of his texts when so many others perished as through his comprehensive approach to mapping, does nevertheless stride like a colossus over the cartographic knowledge of the later Greco-Roman world and the Renaissance. This is perhaps more remarkable in that his work was primarily instructional and theoretical, and it remains debatable if he bequeathed a set of images that could be automatically copied by an uninterrupted succession of manuscript illuminators. Ptolemy's principal legacy was thus to cartographic method, and both the *Almagest* and the *Geography* may be regarded as among the most influential works in cartographic history. It would be wrong to over emphasize, as so much of the topographical literature has tended to do, a catalog of Ptolemy's "errors": what is vital for the cartographic historian is that his texts were the carriers of the idea of celestial and terrestrial mapping long after the factual content of the coordinates had been made obsolete through new discoveries and exploration. Finally, the interpretation of modern

scholars has progressively come down on the side of the opinion that Ptolemy or a contemporary probably did make at least some of the maps so clearly specified in his texts. It is somewhat difficult to understand or appreciate the popularity of Ptolemaic world maps during the 16th century when it was well known and accepted that the Indian Ocean was an open ocean and that Africa was circum-navigable and not connected to Asia by a land bridge. Yet many editions of Ptolemy's *Geopgraphia* with maps were published during the 15th and 16th centuries.


*Another Ptolemaic world map from 1550 by Sebastian Munster in his Cosmographia. Note that this common Ptolemaic interpretation displays Ptolemy's belief in a "land bridge" connecting Africa with Asia and enclosing the Indian Ocean, without disclosing what lies to the south of this land bridge, or Africa.*

5.11


*Another map of Africa on a trapezoidal projection by Vincenzo Valgrisi, 1561, based upon Ptolemy. Note that no attempt is made to depict any part of southern Africa even though this map was drawn 60 years after the Portuguese circumnavigated Africa.*

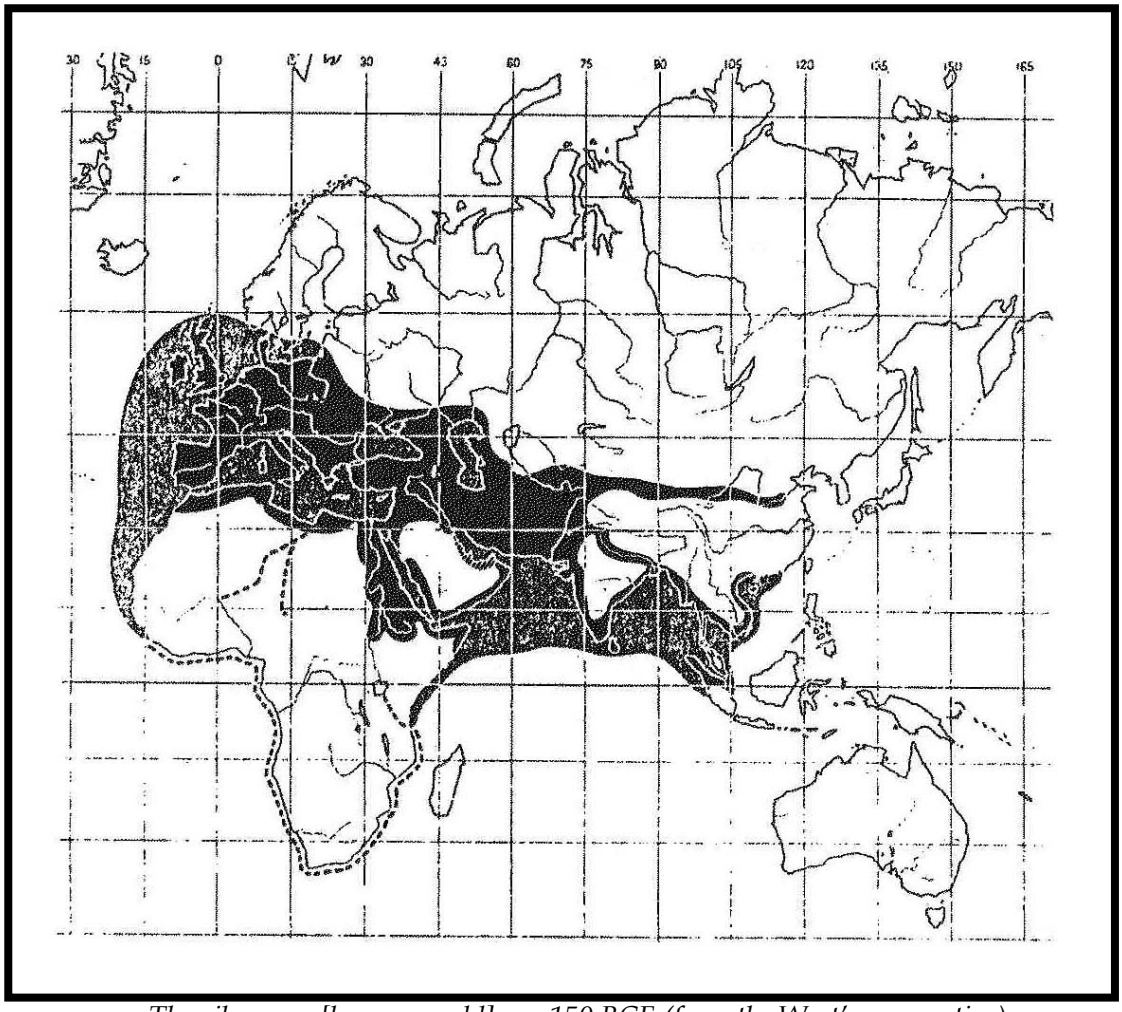



*The oikumene [known world], ca. 300 BCE (from the West's perspective)*

**Summary**

To summarize this "ancient cartographic period", no contemporary world maps from the ancient Greeks, Romans, Arabs or Chinese showing any part of Libya/Africa has survived. All of these ancient geographical texts were produced in Western Europe, primarily in Greece and the Roman Empire. That said, many of the ancient geographical writings describing contemporary concepts of the world, including Africa, have survived and the maps presented here are interpretations of these texts by modern 19th and 20th century scholars, and, in case of Pomponius Mela 16th century and Ptolemy, 15th and 16th century cartographers. Again, except for Ptolemy, all of the Greek writers depicted an Africa surrounded by water, limited to roughly north of the equator and separated from Asia by the Red Sea. The Nile River was displayed running south to north from the *Mountains of the Moon* in most texts, or, according to Herodotus, running westward to the Atlas Mountains. Those writers who engaged in describing the world limited their descriptions to the *oikoumene* [known inhabited earth]. Writers like Crates and others certainly accepted the fact that there were other large land areas on the spherical-shaped earth, but nothing was known about them or their potential population. Some philosophers speculated that access to these other unknown landmasses could not be attempted due to extreme weather conditions in the Torrid Zone and the Frigid Zones.

As a result, with respect to Africa, only the northern portion, above the equator, was described, despite the story published by Herodotus of the Phoenician expedition that circumnavigated Africa in a counterclockwise direction in 600 BCE



*The oikumene [known world], ca. 150 BCE (from the West's perspective)*

**Monographs on this website referenced herein:**
***#105*** Homer
***#106*** Greek Views
***#108*** Hecatæus
***#109*** Herodotus
***#112*** Eratosthenes
***#113*** Crates
***#115*** Strabo
***#116*** Pomponius Mela
***#118*** Orbis Terrarum
***#119*** Ptolemy