

## The Middle Ages

- The state of European cartography
- T-O maps and mappa mundi
- East Asian contacts
- The Islamic realm
- Portolan charts
- The rediscovery of Ptolemy
- Improvements in navigation
- The 1400's

## Charlemagne, King of the Franks (742-813)



- Major figure in Medieval European history who supposedly contributed to geography by insisting that, for the sake of uniformity, all future rectangular maps of his realm show north at the top.
- The idea caught on and spread.
- The fleur-de-lis served as the original north arrow.

## Fleur-de-lis



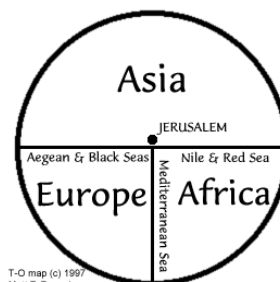
## Earliest printed T-O map, 1472



## T-O map

- A highly simplistic map of the world popular in Western Europe during the Middle Ages.
- The O refers to the map's circular shape.
- The T refers to the stylized placements of the Mediterranean Sea (vertical); the Aegean and Black seas (left bar); and the Nile and Red sea (right bar).
- Jerusalem is at the center, where the three segments (above) meet.
- Typically, T-O maps are "oriented" to show the East Asia at the top.
- Once said to epitomize the Dark Ages, T-O maps are now recognized as objects primarily meant to advance religious instruction instead of geographical knowledge.

## Basic schema of the Medieval T-O Map

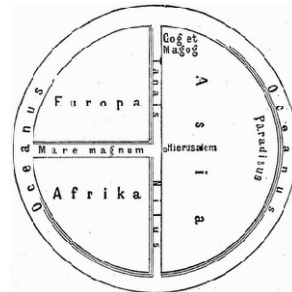


T-O map (c) 1997  
Matt T. Rosenberg

## T – O map design adapted to modern hemispheric map



## Early map with T-O design (Note Jerusalem at center and paradise in Far East)



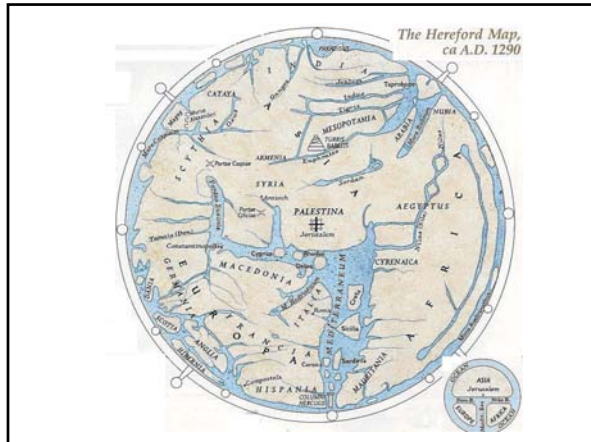
A T-O style  
Mappa Mundi  
from *La Fleur  
des Histoires*,  
1459-1463.

## The Hereford Mappa Mundi



- Dates from about 1290.
- 30 inches in diameter.
- The largest medieval world map known to exist.
- On display at Hereford Cathedral, England
- On vellum in T-O style.
- Jerusalem at center.
- The map is oriented to show "Paradise" – the Garden of Eden – as a circular island at the top, corresponding with East Asia (thereafter, "The Orient").





Reproduction of the Ebstorf map, 1235.  
Original is drawn on 30 goatskins sewn together.

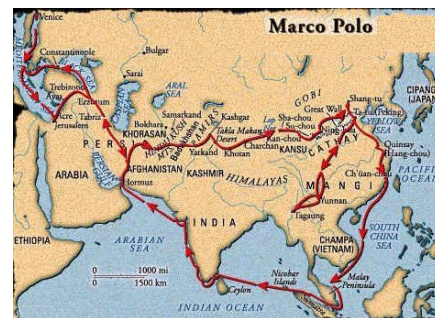


## Marco Polo (1254-1324)



- Prominent member of a Venetian family of merchants famous for their travels to and familiarization with China and other parts of Asia.
- Late in life, dictated what became a very popular book of his travels.
- Influenced construction of the Fra Mauro map (c. 1450) and later voyages of discovery.

## The Travels of Marco Polo



## "The Spice Islands"







### Al-Muqadassi (945/946 – c. 1000)

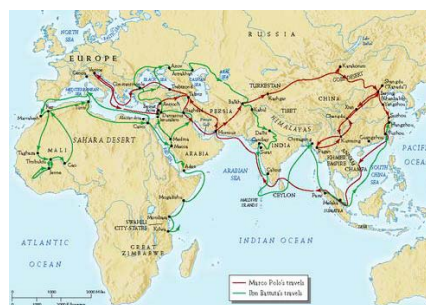
- The most important Arab geographer of the Middle Ages?
- Born in Jerusalem, travelled widely throughout the Arab world.
- Noted for his staunch advocacy of field work at a time when most geographies were compilations of second-hand sources.
- His writings exude meticulous note-taking and attention to the natural and human characteristics of places.
- In his book *The Best Divisions of the Study of Climate* he writes that he cannot present anything to the reader as factual unless he had seen it himself.

### Ibn Battuta (1304-1368/69)



- Moroccan Berber whose pilgrimage to Mecca (began 1325) began a life of travel, eventually covering some 75,000 miles, mainly in Africa and Asia. Returned home in 1354.
- Visited the torrid zone, including points south of the equator.
- Kept no records. Late in life, dictated his travels (*Rihla*, "The Journey") from memory to Ibn Juzayy.
- While parts are apocryphal, it is probably the best description of the areas

### The Travels of Marco Polo and Ibn Battuta



### Muhammad al-Idrisi (1099-1165/66)

- Muslim geographer and cartographer who lived in Sicily under the patronage of the Christian King Roger II.
- Used first-hand knowledge from his European travels and knowledge gleaned from Muslim and European merchants and explorers to create what was then the most accurate map of the world.
- His descriptive geography, written to accompany his world map (drafted in silver for King Roger II), reveals many inaccuracies in the Aristotelian division of the world into 5 climatic zones (two frigid, two temperate, and one torrid), and proposes a more sophisticated climatic system.

### World Map by Al Idrisi



Introductory map from  
Al-Idrisi's world atlas, 1154



**Tabula Rogeriana** by Al-Idrisi, 1154  
(a compilation of 70 double-page maps from  
Idrisi's atlas compiled for King Roger II of  
Sicily)



**Tabula Rogeriana**



**Pietro Vesconte**

Genoese cartographer and portolan chart pioneer  
whose works appeared during 1310-1330



## Portolan chart

- From the Italian *portolano* – “related to ports or harbors.”
- Originated in Portugal, Spain and Italy in the 14<sup>th</sup> century.
- They indicate and label the outline of coasts in great detail.
- Meant to provide precise locations of harbors, whether for purposes of commerce or refuge, and to help mariners pinpoint their locations after travelling across open waters.
- Crisscrossing lines represent the 32 points of the mariner's compass
- Suggest the growing importance of *piloting* as a complement to *navigation*.

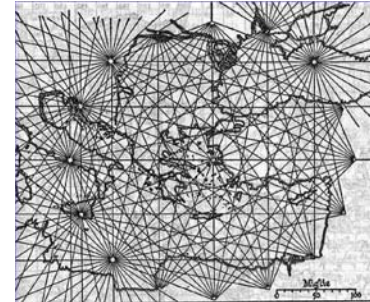
Pietro Vesconte  
portolan chart of the Adriatic Sea, 1318



Pietro Vesconte *mappa mundi*, early 14<sup>th</sup> century



Pietro Vesconte portolan chart, 1311



Pietro Vesconte portolan, 1325  
Atlantic Europe “upside down”

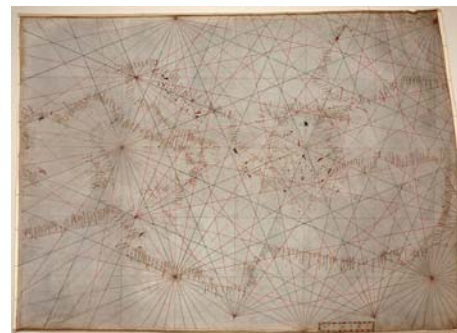


Portolan by Jorge Aguiar, 1492



Albertinus de Virga was a 15<sup>th</sup> century Venetian cartographer. Nothing more is known of his life, save two very old maps that have survived.

The De Virga 1409 portolan chart is the oldest piece of original cartography in the Library of Congress.





### De Virga mappa mundi, 1411



### Hourglass

(in Lorenzetti's *Allegory of Good Government*, 1338)



- A timekeeping device that replaced the water clock by virtue of superior accuracy.
- Origin unknown.
- Probably invented in Western Europe, perhaps as early as the 8<sup>th</sup> century A.D.
- In widespread use by the 14<sup>th</sup> century.

### The Chip Log (ca. 1500-1600)



### The Chip Log

- A major improvement to dead-reckoning
- Basically an early speedometer.
- A light line is knotted at regular intervals and attached to a log, which was tossed overboard at the stern.
- The pilot counted the knots that were let out over a specific period of time, as measured by a minute glass or similar timer.
- From this the speed of the vessel could be determined.
- To this day, a ship's speed is stated in "knots."

### Ptolemy's map of the world



### Maximus Planudes

(c.1260 - c.1305)

- Byzantine monk and grammarian famous for translating many ancient books and manuscripts from Latin into Greek and vice versa.
- Sometime around 1300 he discovered a copy of Ptolemy's *Geography* in a monastery in Constantinople and translated it from its original Greek into Latin.
- Subsequent copies, which included redrafts of Ptolemy's map of the world, spread to western Europe, where they influenced discussions that would influence later European voyages of discovery.

### Cardinal Pierre d'Ailly (1351-1420)



- French theologian and writer.
- 2<sup>nd</sup> edition of his book *Tractatus de Imago Mundi* (1414) is one of the first to make use of the Latin translation of Ptolemy's Geography (1406).
- Disputes Ptolemy's idea of an enclosed Indian Ocean and accepts smaller estimate of Earth's circumference.
- Suggested India could be reached by sailing west.

### Prince Henry, the Navigator (1394-1460)



- A junior prince of the Kingdom of Portugal who was appointed governor of the Order of Christ (1420) and used its riches to promote exploration (cartography, navigation, ship design . . .).
- The success of his patronage was largely responsible for the ascent of tiny Portugal to the status of a major player in the future European political and economic domination of much of the world.



### Sagres



### Sagres





## Sagres

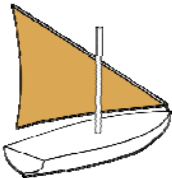


## Caravel



- A relatively small and highly maneuverable oceangoing vessel refined in the 15<sup>th</sup> Century by the Portuguese and used in many of their subsequent voyages of discovery.
- Noted for its lateen sails.
- Carried a crew of about 20.

## Lateen (sail)



- A triangular sail hung from a long yard (supporting piece of wood) mounted at an angle on the mast.
- Makes for great maneuverability (especially to windward) and speed since the sail can be set at a variety of angles with respect to the mast.
- In use during Roman times, if not earlier.

## Caravel



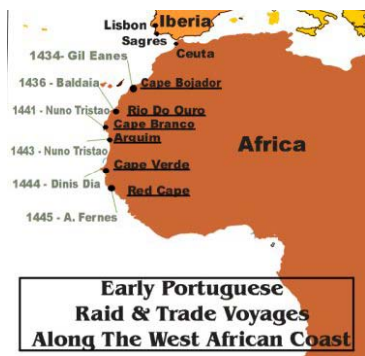


## Gil Eannes (15<sup>th</sup> Century A.D.)



- Portuguese explorer, navigator and ship's captain who sailed in the service of Prince Henry the Navigator.
- Made numerous voyages along the northwest coast of Africa.
- In 1434 he commanded the first the first known ship to sail south of Cape Bojador and return, proving the "torrid zone" was not fatal to humans.

## Cape Bojador, Southern Morocco





**Inverted Fra Mauro world map, ca. 1450**



Fra Mauro was a 15<sup>th</sup> century Venetian monk who drafted a world map surprising for its accuracy. Possibly incorporating information derived from China and Africa, it suggests an all-water route between Europe and Asia. The map was produced under the patronage of King Alfonso V and acquired by Prince Henry.

[A lunar crater is named in the monk's honor.]



**Siege of Constantinople**





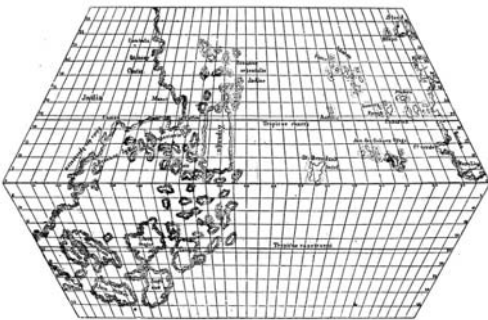


### Paolo dal Pozzo Toscanelli (1397-1482)



- Italian cosmographer whose 1474 map of the Atlantic Ocean influenced the westward voyage of Columbus by grossly underestimating the distance to India.
- Columbus would go to his grave (1506) believing he had reached "the Indies" as opposed to a previously unknown continent (i.e., to the Europeans).

### 1474 Toscanelli Map of the Atlantic Ocean later acquired by Columbus



### Modified 1474 Toscanelli map of the Atlantic Ocean showing North America

