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**Chapter 1 -  
Introduction to  
The Oceans**

A photograph of a tropical beach scene. The water is a vibrant turquoise color, and the sky is a deep blue with a few white clouds. A line of palm trees is visible on the horizon.

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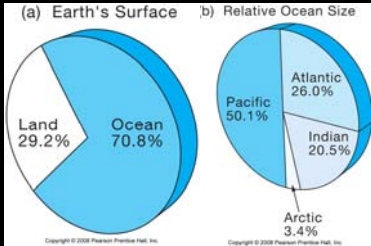
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- 70.8% Earth covered by ocean
- Interconnected global or world ocean
- Oceans contain 97.2% of surface water




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### Principal oceans

- Pacific
  - Largest, deepest
- Atlantic
  - Second largest
- Indian
  - Mainly in Southern Hemisphere

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- Arctic
  - Smallest, shallowest, ice-covered
- Antarctic or Southern Ocean
  - Connects Pacific, Atlantic, and Indian
  - South of about 50° S latitude

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**Side Bar Info!**



**Ernest Shackleton and The Endurance**

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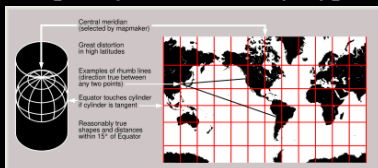
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**Side Bar Info!**

**Map Projections – Many Types!**



E.g.: The Mercator projection shows courses of constant bearing as straight lines. While common, scholars advise against using it for reference maps of the world because it drastically inflates the high latitudes. (Source: wikipedia.com)

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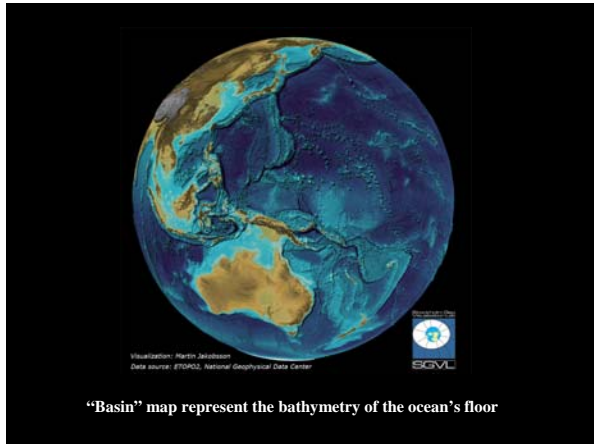
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## Oceans versus Seas

- Smaller and shallower than oceans
- Salt water as well
- Usually enclosed by land
  - With exceptions though...Sargasso Sea defined by surrounding ocean currents
- The “Seven Seas” were collectively N and S Pacific, N and S Atlantic, Indian, Arctic, Antarctic

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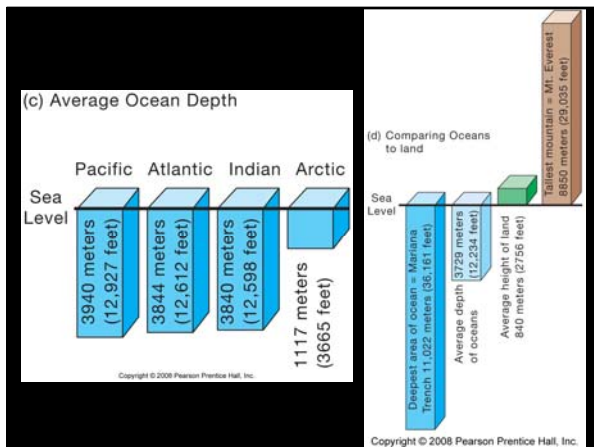
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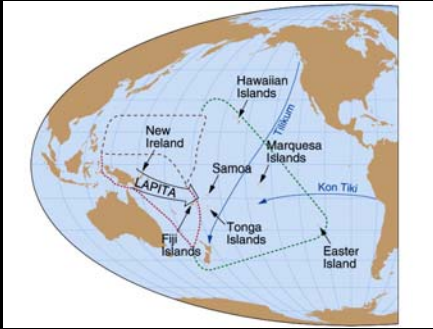
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**Early Evidence of Ocean Travel**  
**1. The Pacific Islands (Asia or N. and S. America?)**

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**Dr. Thor Heyerdahl and the Kon-Tiki**

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**2. The Atlantic and Mediterranean**

**a) Phoenicians - By 2000 B.C., they had explored the Mediterranean and Red Seas, and parts of the Indian Ocean**



- b) Greeks**
- c) Romans**

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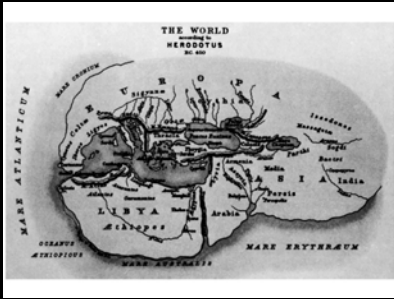
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### The Scientific Discoveries of the Greeks



Herodotus - maps the 'world according to the Greeks' in 450 B.C.

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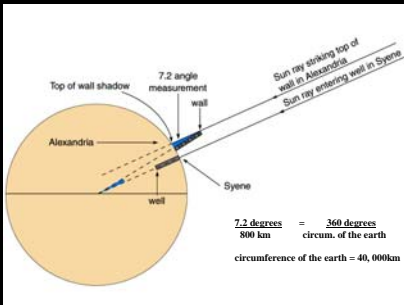
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### The Scientific Discoveries of the Greeks



Eratosthenes - Accurately determines the Earth's circumference

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### The Scientific Discoveries of the Romans

Strabo - observed the land periodically rising and sinking  
Ptolemy - produced map below (note lines of Lat & Long)



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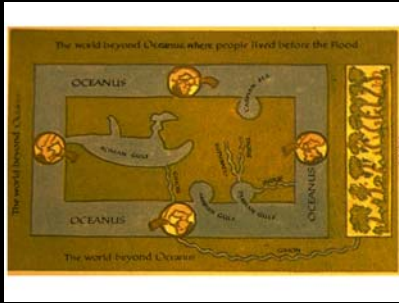
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## The Middle Ages and Ming Dynasty - A Step(s) Backwards!



Cosmas - 6th century navigator drew map of Earth as a flat rectangle!

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The Vikings were active explorers.

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### Side Bar Info!

#### The Vinland Map: Real or Fake?



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**The Ming Dynasty (14-15th Century)**  
 sent 5-masted ships throughout the  
 Indian Ocean on diplomatic  
 and trading missions.

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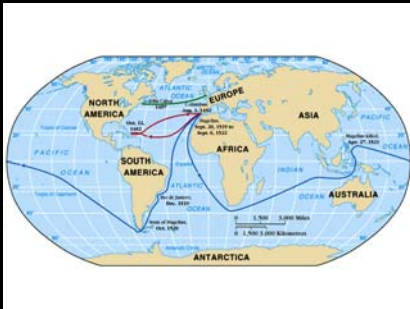
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**European Exploration and the Renaissance**



**Columbus (1492), Cabot (1497), Magellan (1519)**

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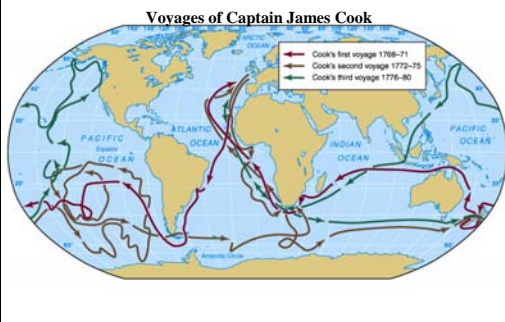
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**The Beginning of Ocean Science**




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**Benjamin Franklin and the Gulf Stream**

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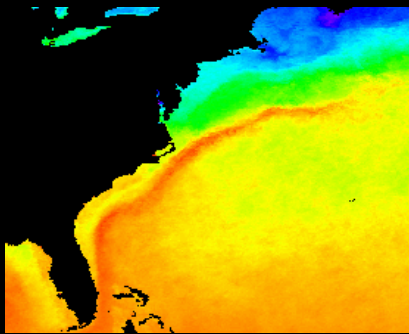
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**The gulf stream from a satellite image showing temperature differences**

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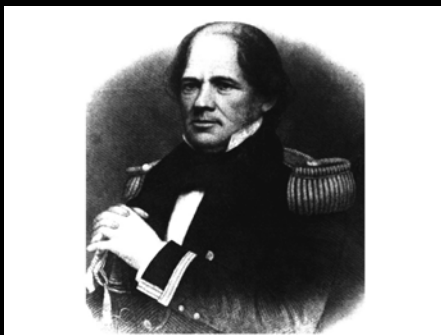
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**The Father of Oceanography  
Matthew Fontaine Maury (1806-1873)**

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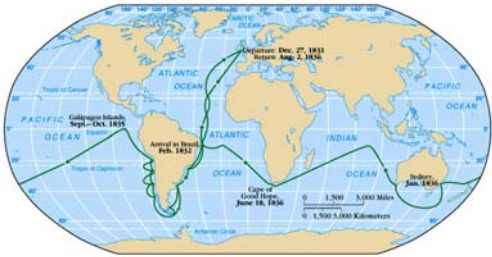
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### Charles Darwin (1809-1882) and the Beagle



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### The Rosses (John and James Clark)



Baffin Bay - ocean floor depth of 1.8 km



Antarctica Mission - recovered bottom dwellers from 7 km deep

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### H.M.S. Challenger

- covered 127, 500 km

-discovered and classified 4,717

new marine species

-record depth measurement at 8, 185 m (~27, 000 ft)



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## Fridtjof Nansen and the Fram



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A Nansen bottle is a device for obtaining samples of seawater at a specific depth. It was designed in 1910 by the early 20th-century explorer and oceanographer [Fridtjof Nansen](#) and further developed by [Shale Niskin](#) ([Wikipedia.com](#))

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## Twentieth Century Oceanography

1. Voyage of the Meteor (1925)
2. Oceanography gets "Institutionalized"
  - Musee Oceanographique (Monaco) in 1903
  - Scripps Institution of Oceanography in 1912
  - Woods Hole Oceanographic Instit. (1930s)
  - U. of Miami's Rosenstiel School of Marine and Atmospheric Sci.

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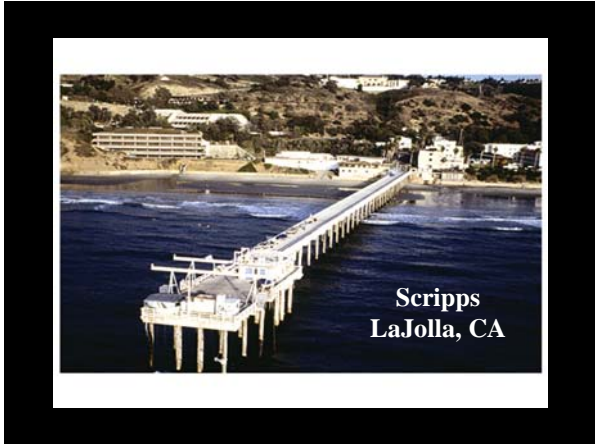
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