Setting the Stage for the Age of Discovery

"There is no sea unnavigable, no land uninhabitable."
- Robert Thorne (Merchant and Geographer (1527)

To discover the planet, mankind would need to be liberated from ancient hopes and fears, and open gateways of experience. The largest dimension of space, the continents and the oceans, were only slowly revealed.

The West proved a vantage point, and for most of history the West would be the discoverer, the East the discovered.

The first reaches from the West to another half of the planet came from laborious and lonely overland travelers. But the full extent of the planet would be glimpsed only by organized communities of adventure on the sea, which became a highway of grand surprises.

Ancient View of Earth and Universe (pp 92-99)

Greeks
- Earth: search for symmetry, surrounded by great desert
- Universe: Atlas bearing Earth on his shoulders

Peruvians, Aztecs
- Earth: square box-like earth
- Universe: five squares, middle place where gods dwelled

Hindu
- Earth: hemisphere
- Universe: four elephants standing on tortoise floating in water

Eratosthenes (275-195 BC)

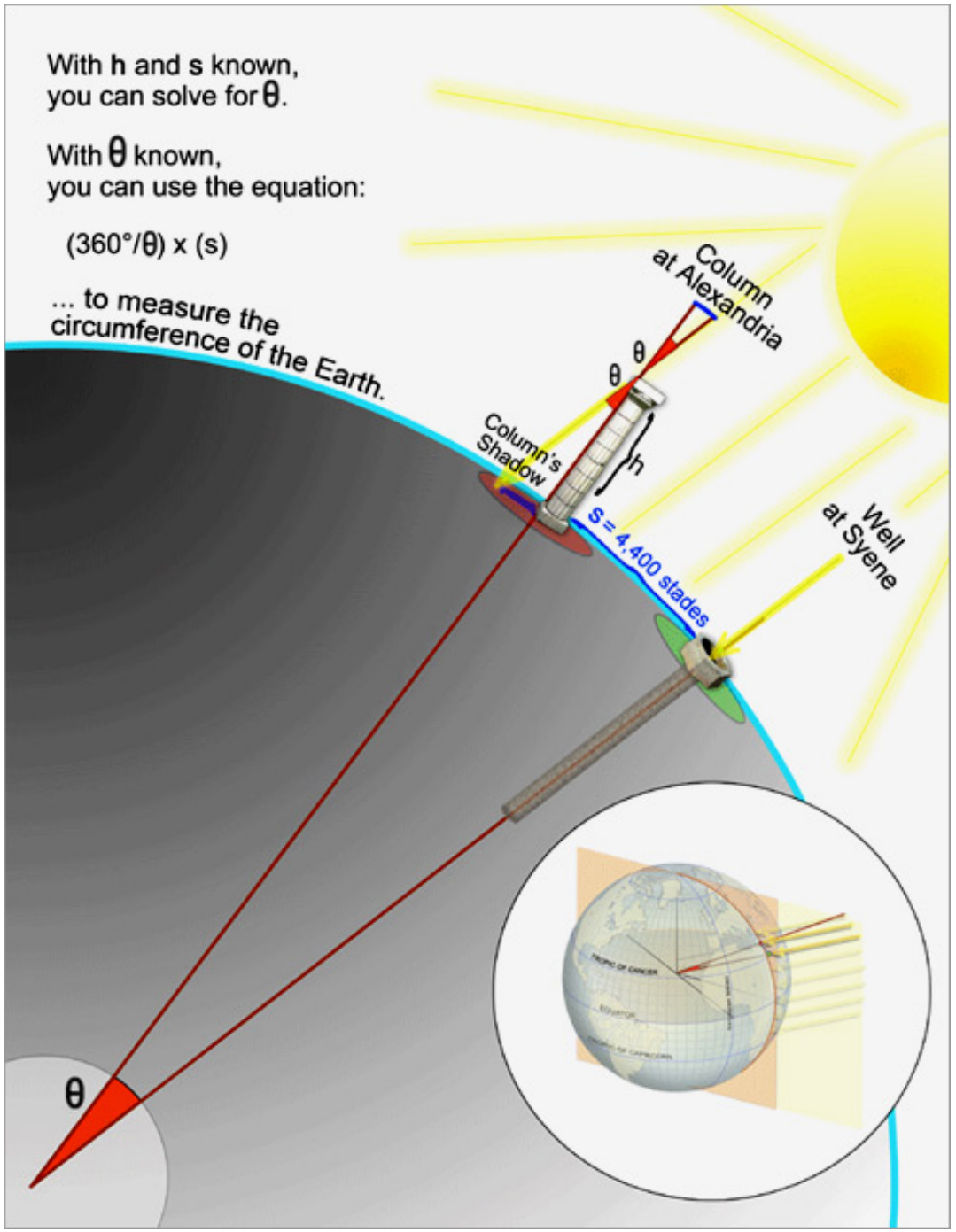
Used the lack of a shadow of the sun in a well at Syene (Aswan) on June 21 (summer solstice), a day when sun directly overhead in Syene. On that day, he used a shadow cast by an obelisk in Alexandria to calculate the angular separation between Syene and Alexandria on the circumference of the Earth. He computed the circumference of the Earth only 15% to large! (pp 95-96).

"His fruitful combination of the theory of astronomy and geomtery with the evidence of everyday experience provided a model too long forgotten after his time".

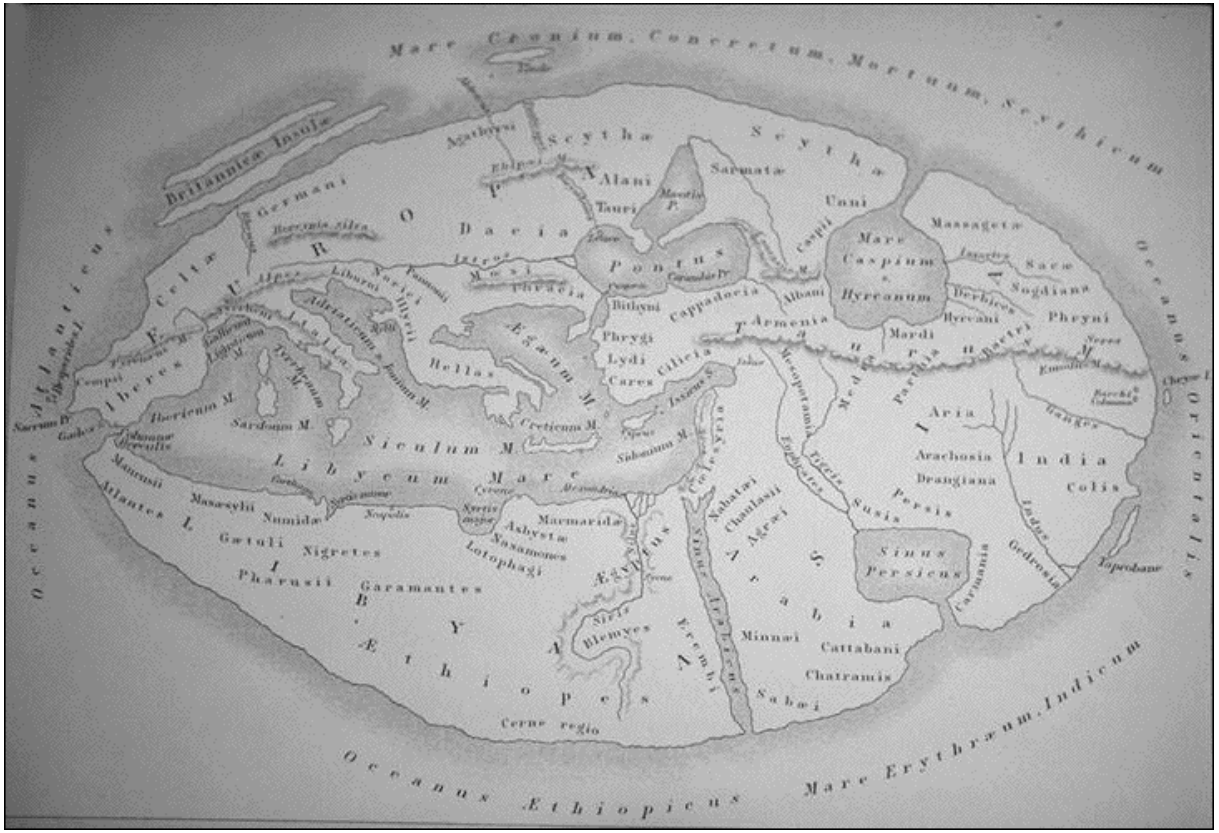
Eratosthenes Experiment

Observation
Astronomy
Geometry

We will see that this kind of logical approach to understanding the world was shut down for 1000 years



Herodotus 450 BC



Dionysius 124 AD

The Invention of Geography

Hipparcus (165 -127 BC)

… insisted each place [on earth] be located by exact astronomical observation on a worldwide grid of latitude and longitude.

- thinking Earth was round… developed degrees, minutes, and second of arc!

Ptolemy (165 -127 BC)

… followed Hipparcus' lead. Wrote a huge book called "Geography"… outlayed all of modern geography and set the stage for future exploration and mapping of the world.

When the time came, Columbus, the Spanish, the Portuguese, and the Arabs used Ptolemy's geography as the standard.

"If, in the millennium after Ptolemy, mariners and their royal sponsors had freely and adventurously carried on where Ptolemy left off, the history of the Old World and the New World might have been quite different."

All this great start was forgotten and wiped out in a

Period of Great Interuption (300 - 1300 AD)

by what Boorstin calls "The Prison of Christian Dogma"

In the East mean while …

Chang Heng (78-139 AD) p 111
Phei Hsui (Chin dynasty 265 - 420 AD) p 112

18 sheet map of China using coordinates called ching and wei (the same names for the warp and weft on silk weaves). Though Earth was flat.

In 801, T'ang dynasty completed a 30 foot by 33 foot grid map at 1":100 li (li=33.3 miles)!

An early Western Han Dynasty (202 BC – 9 AD) silk map found in tomb 3 of Mawangdui, depicting the Kingdom of Changsha and Kingdom of Nanyue in southern China (note: the south direction is oriented at the top, north at the bottom).