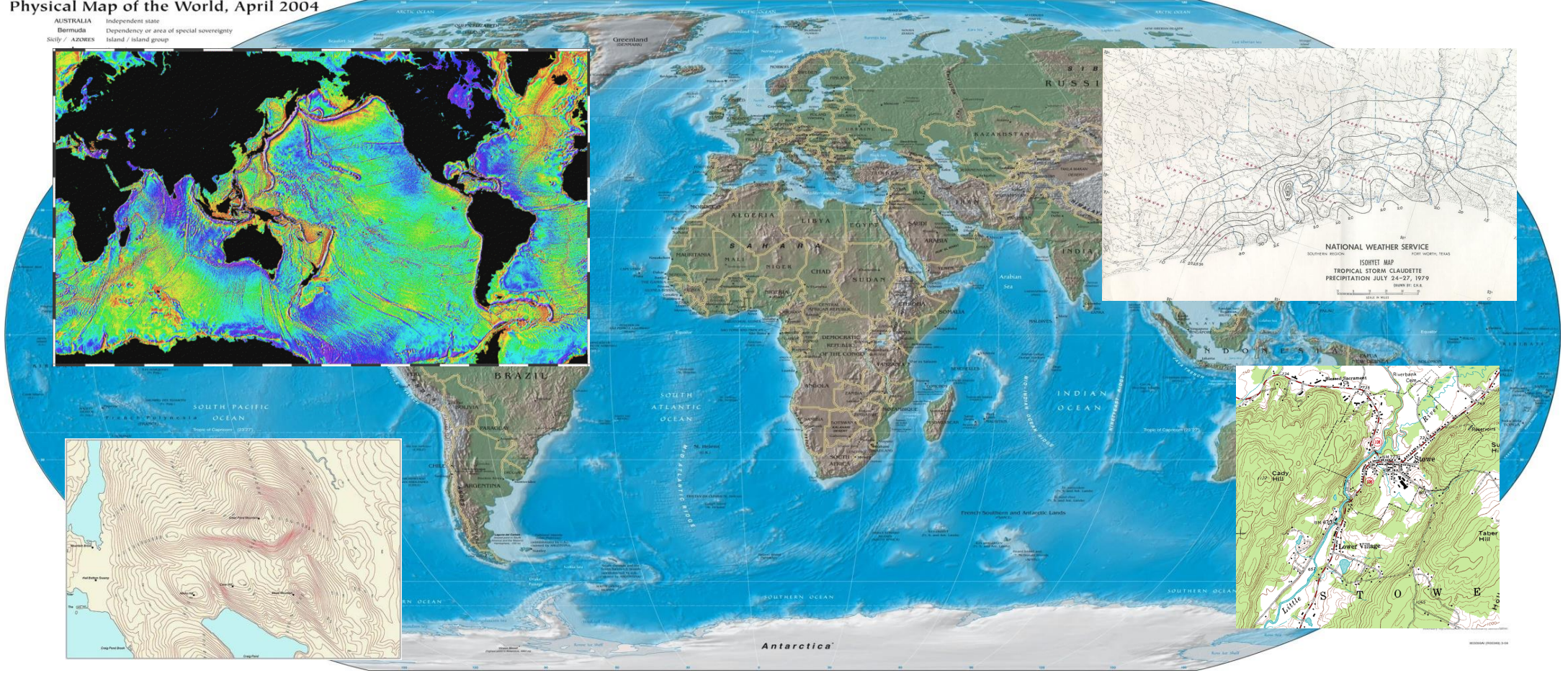


Mapping

Dr. Bharath H Aithal
Research Scholar
CST, IISc, Bangalore

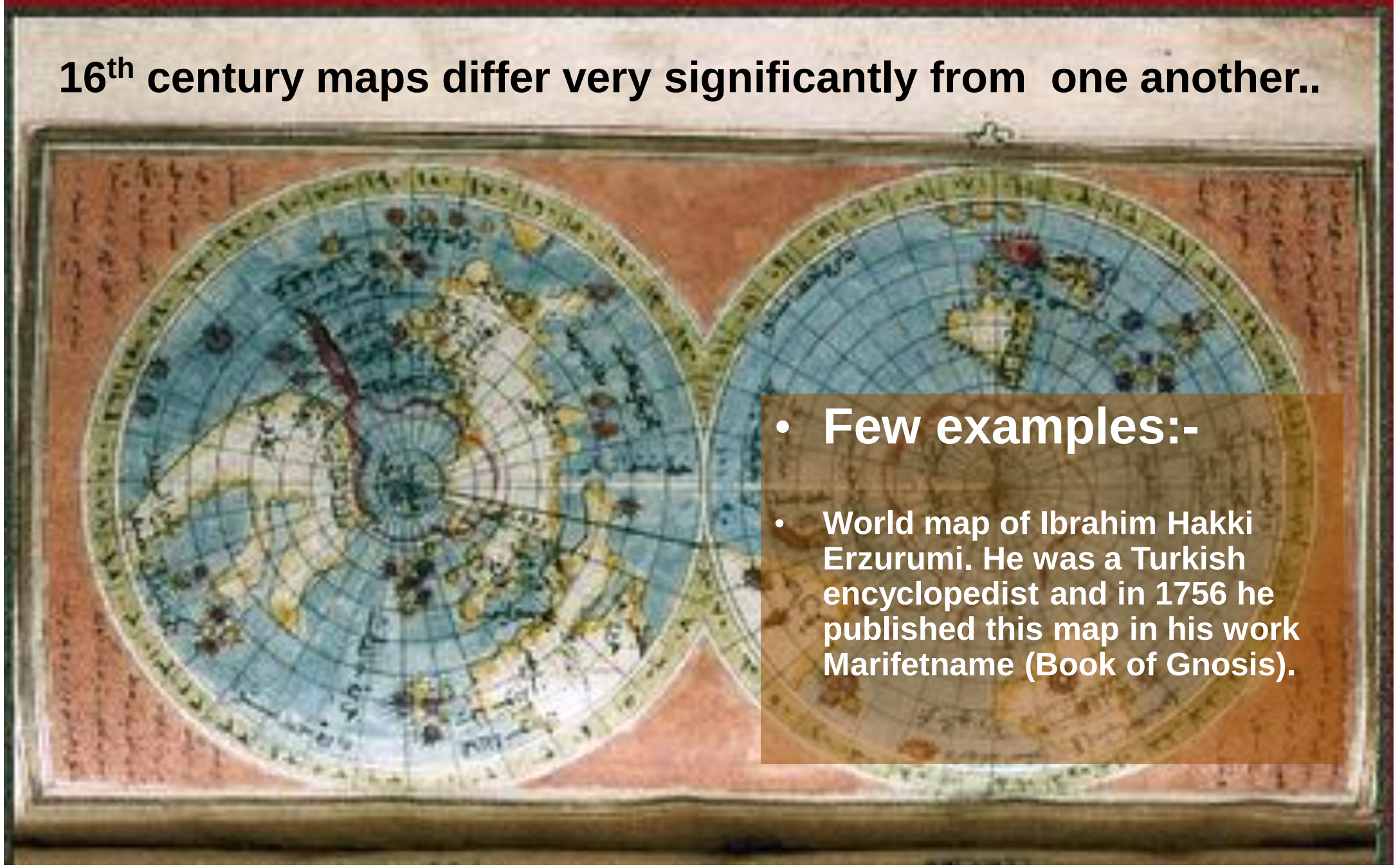
MAPS

Map: It is a plane representation of earth surface with definite scale.

Ancient maps...

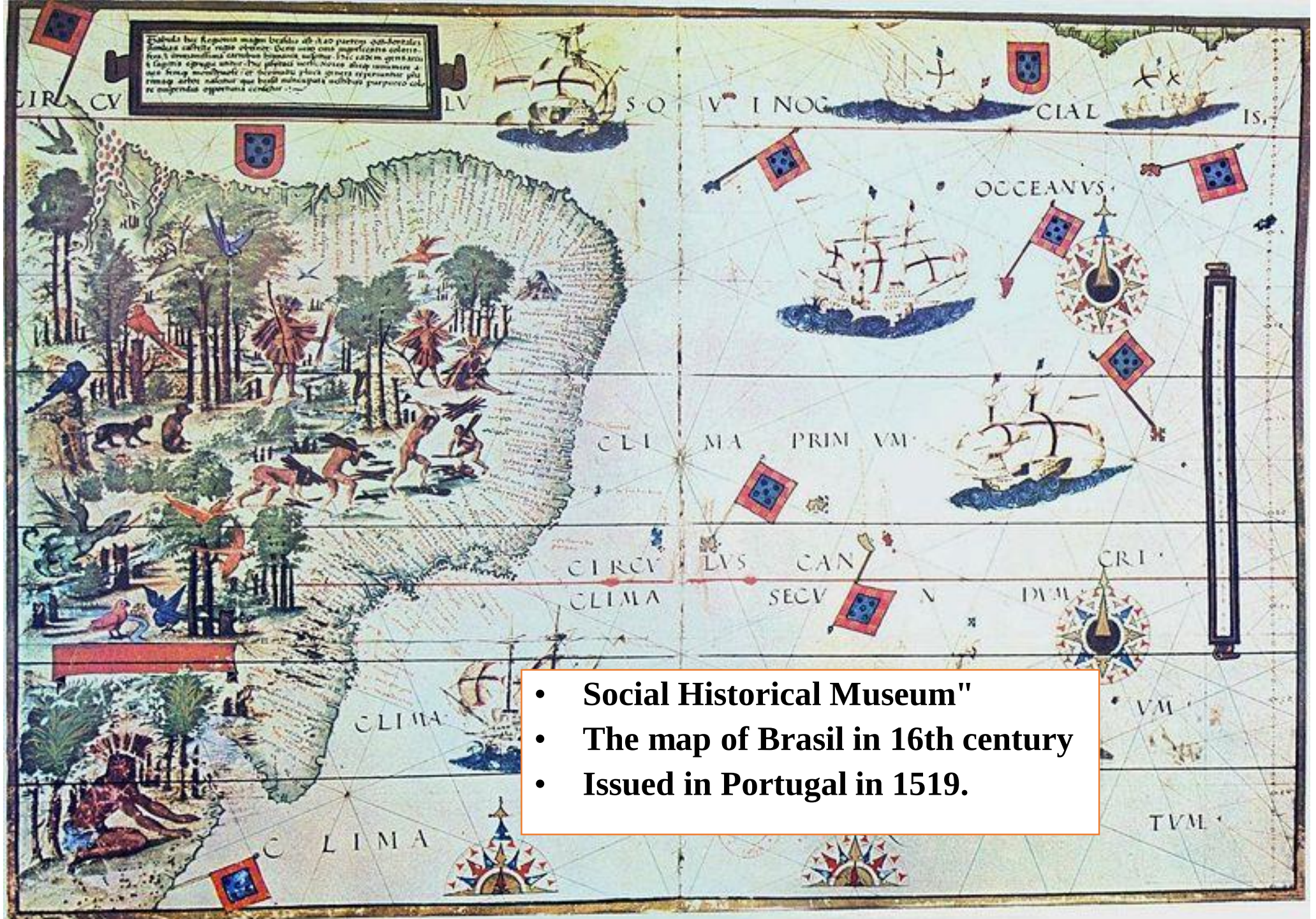
- <u>Few examples:-</u>
- The oldest known world map is the Imago Mundi of 6th century BC Babylonia.
- The map shows Babylon on the Euphrates, surrounded by a circular landmass showing Assyria, Armenia and several cities.
- Land Surrounded by a "bitter river" (Oceanus), with seven islands arranged around it so as to form a seven-pointed star.

16th century maps differ very significantly from one another..



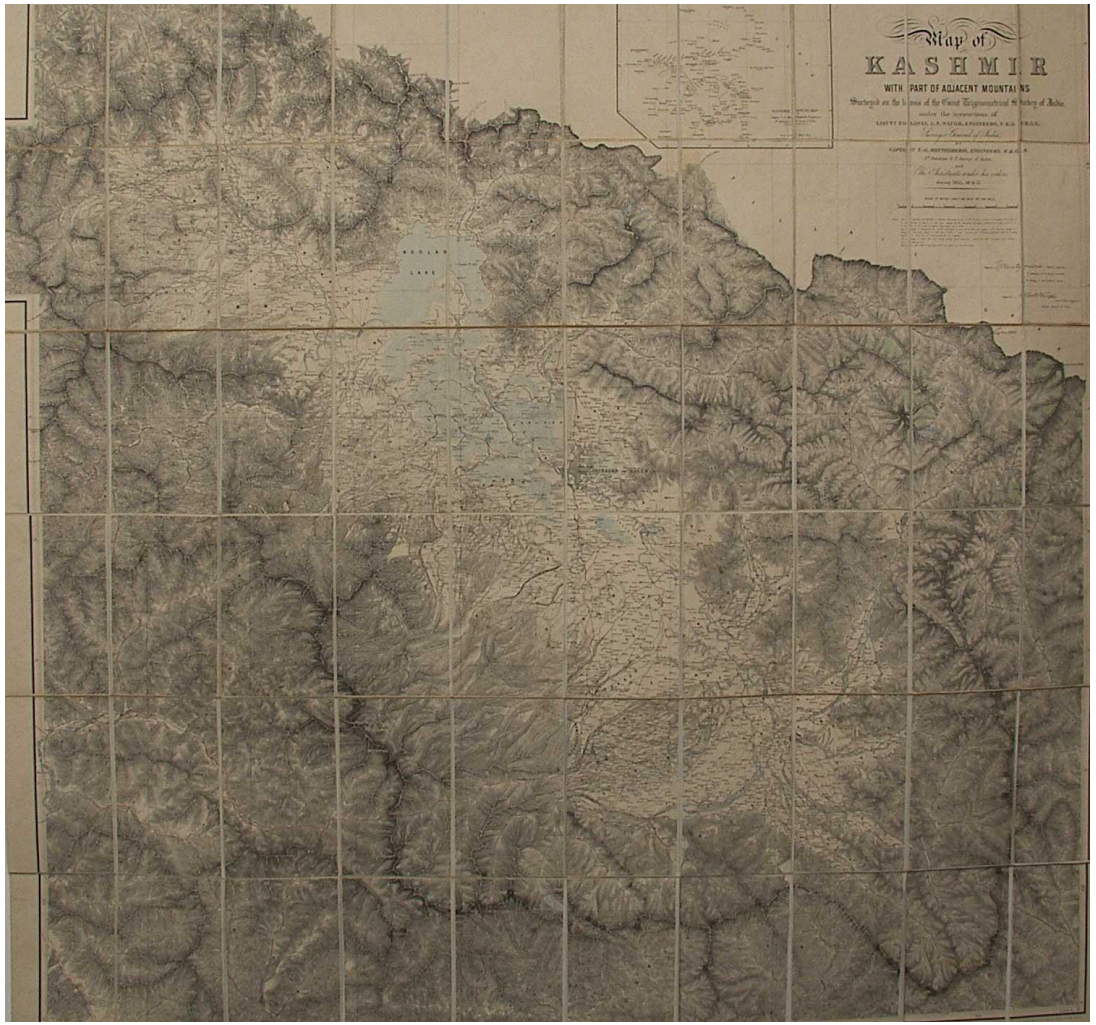
- **Few examples:-**
- **World map of Ibrahim Hakki Erzurumi. He was a Turkish encyclopedist and in 1756 he published this map in his work Marifetname (Book of Gnosis).**

- The Kangnido Map of the world made in Korea in 1402 by Kim Sa-hyeong.
- The map was created during the reign of Taejong of Joseon, preceding the first European voyages of exploration. Painted on silk.



- **Social Historical Museum"**
- **The map of Brasil in 16th century**
- **Issued in Portugal in 1519.**

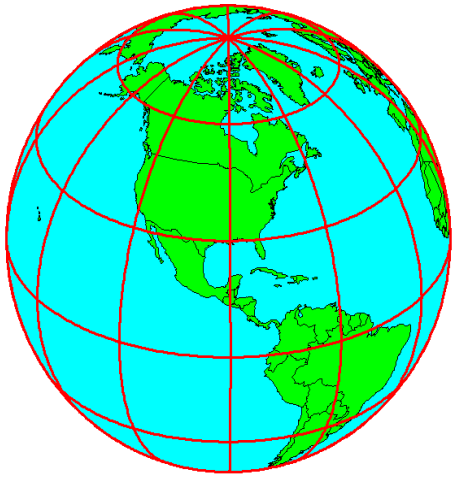
Indian scenario



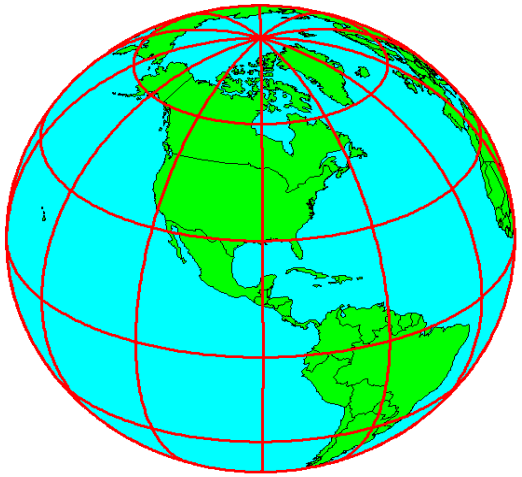
- In India, scientific mapping started by the establishment of Survey of India, in 1767.
- It was established for helping East India Company for topographical survey.
- Till the end of the century, most of the country was mapped.

Shape of the Earth

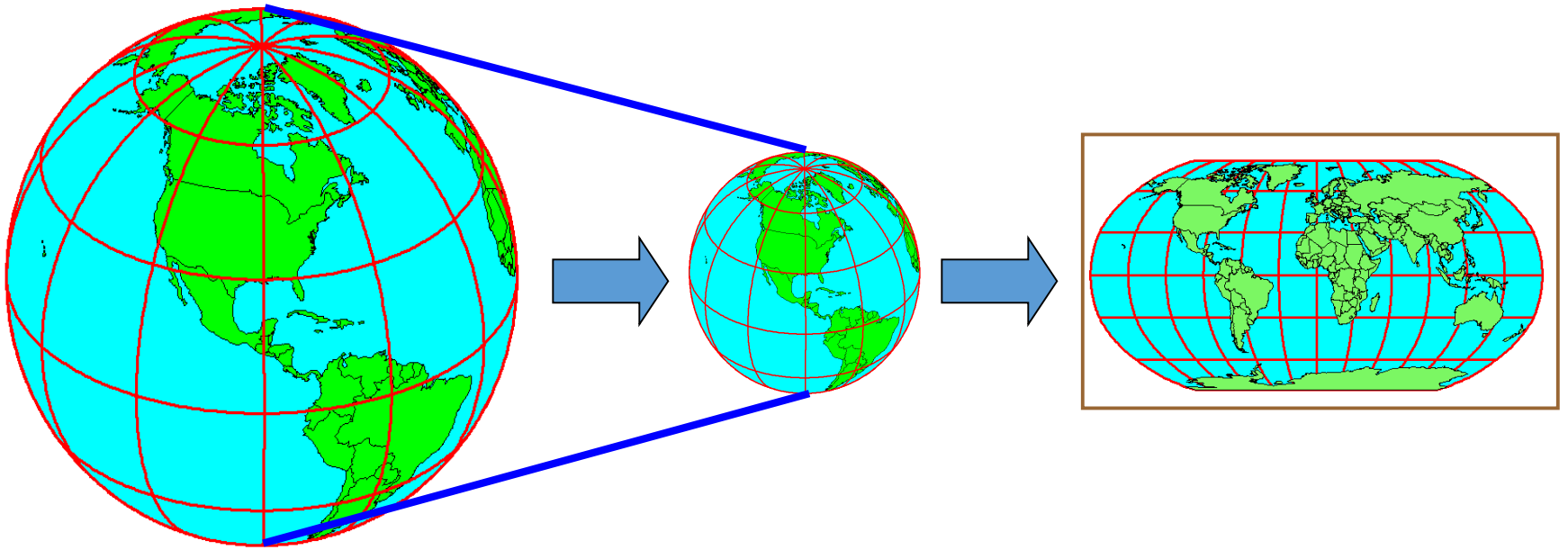
We think of the earth as a sphere



It is actually a spheroid, slightly larger in radius at the equator than at the poles



Earth to Globe to Map



Map Scale:

Representative Fraction

$$= \frac{\text{Globe distance}}{\text{Earth distance}}$$

(e.g. 1:24,000)

Map Projection:

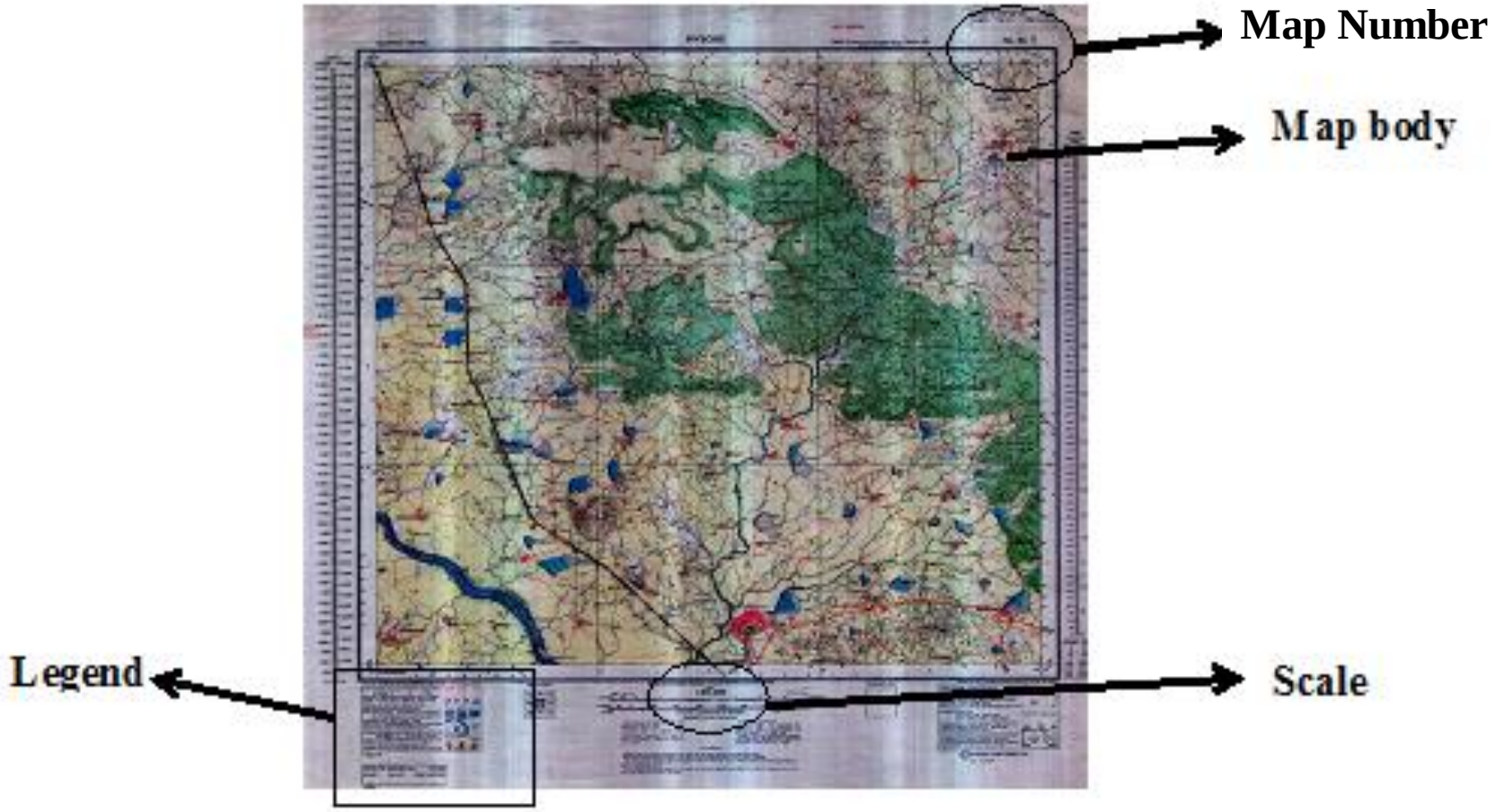
Scale Factor

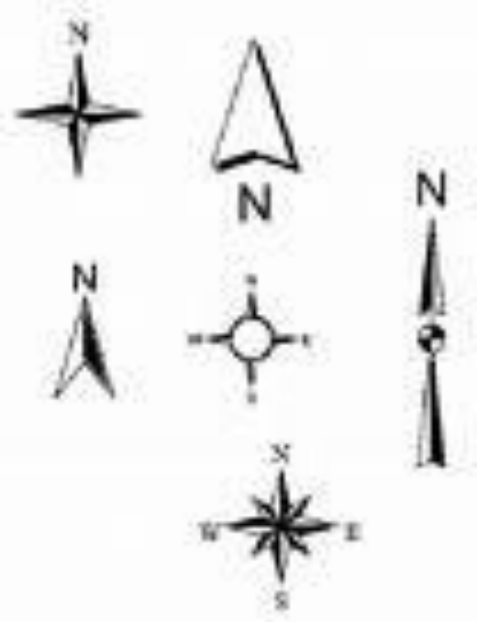
$$= \frac{\text{Map distance}}{\text{Globe distance}}$$

(e.g. 0.9996)

Some common features of a map

- Map body
- North arrow
- Scale bar
- Legend box
- Map date

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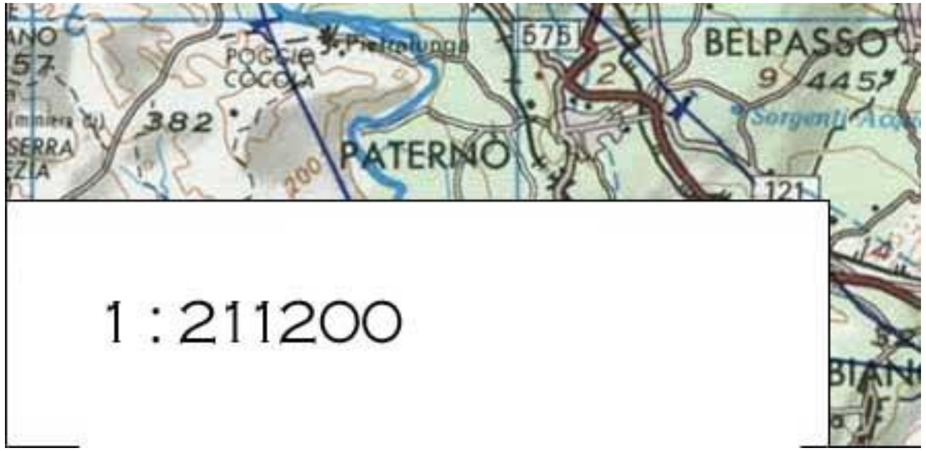
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382
575
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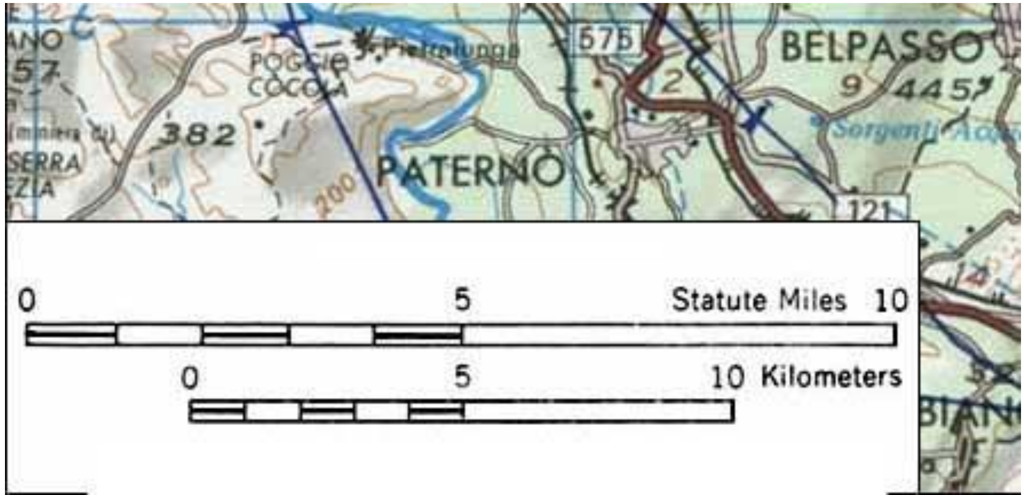
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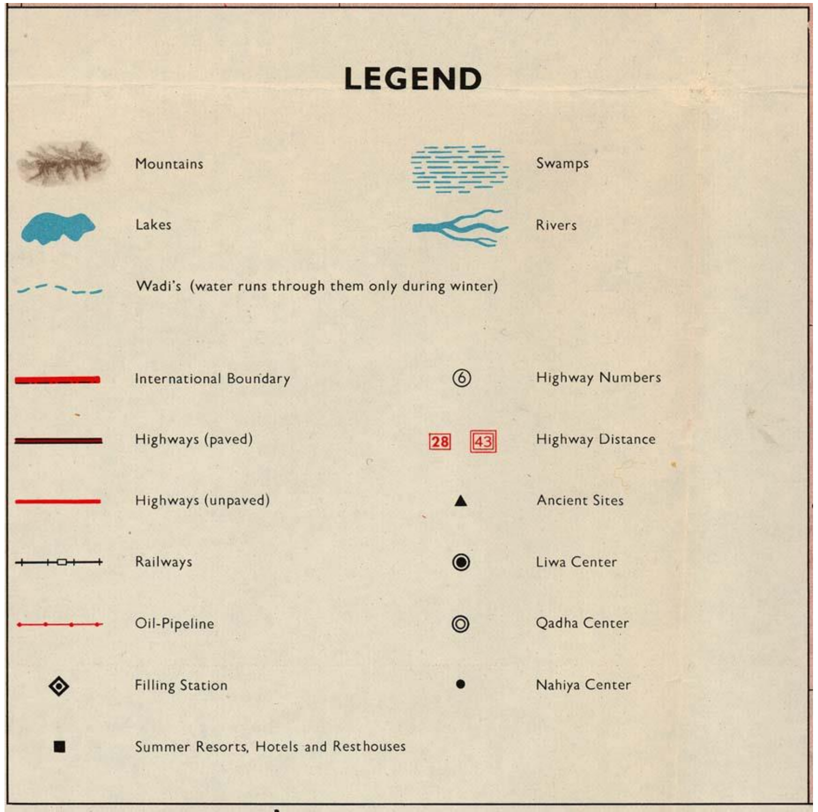

LEGEND
Mountains
Swamps
Lakes
Rivers
Wadi's (water runs through them only during winter)
International Boundary
Highway Numbers
Highways (paved)
Highway Distance
Highways (unpaved)
Ancient Sites
Railways
Liwa Center
Oil-Pipeline
Qadha Center
Filling Station
Nahiya Center
Summer Resorts, Hotels and Resthouses

Scale

- Scale is the ratio between distances on a map and the corresponding distances on the earth's surface
- Scale is essentially a ratio or representative fraction
- **Map scale:** Three ways :

  - By statements: Represent in words.

  -By Numerical fraction: expressed through ratio or representative factor (R.F.).

  R.F.= map distance /Ground distance.

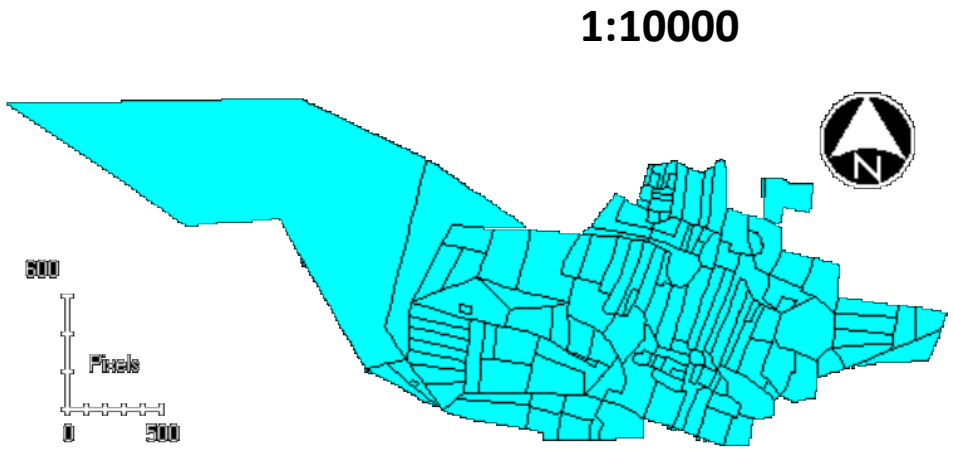
  -By graphical representation: Scale represent through bar diagram.

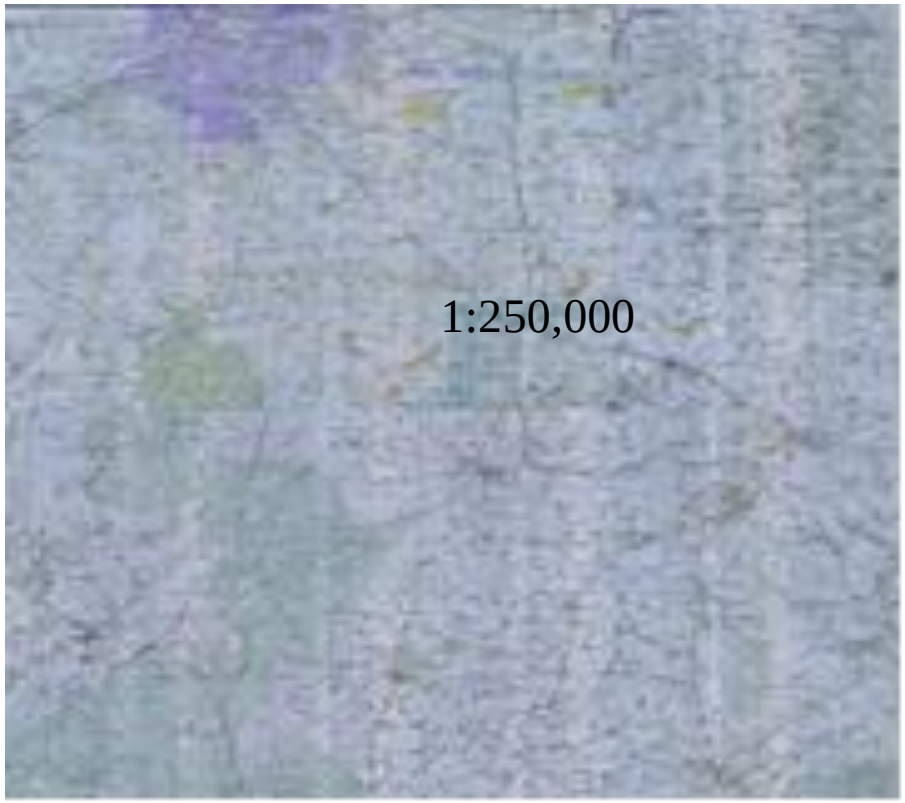
- e.g., a scale of 1:250,000 means that 1unit on the map corresponds to 250,000 units the real world
- Small scale: small fraction such as 1:10,000,000 shows only large features
- Large scale: large fraction such as 1:25,000 shows great detail for a small area

“small scale” versus “large scale” – always a confusion

large scale map of 1:25,000 may show individual buildings

smaller scale map of 1:250,000, 1:500,000 shows only points representing cities, villages, towns





Map classification based on scale

Topographical maps

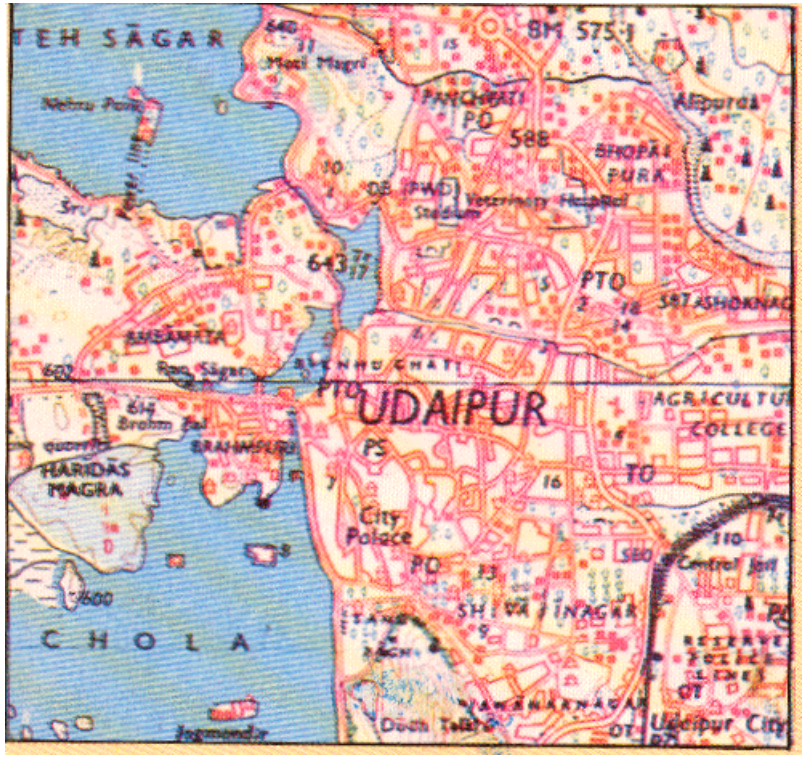
•**Contain natural and man-made features of land area.**

•**Scales:-**
•**1:250,000**
•**1:50,000**
•**1:25,000.**

•**1:50,000 maps cover all parts of India.**

•**1:25,000 maps are available for selected locations of the country only.**

•**The authority to prepare topographical maps in India is Survey of India.**



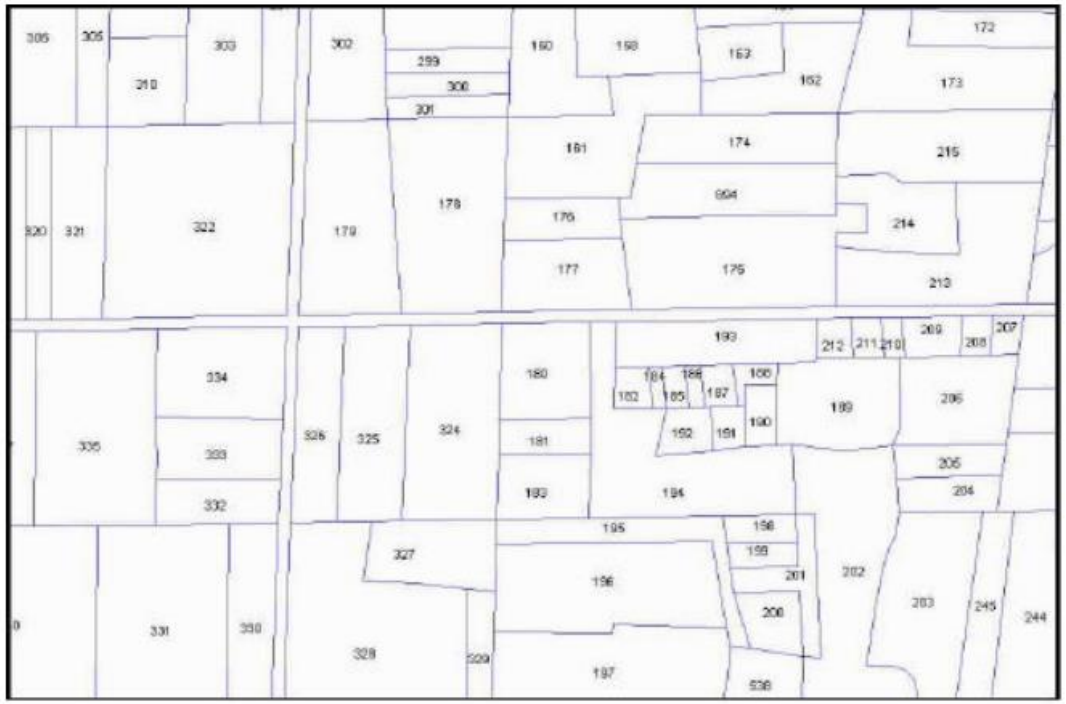
Cadastral / Revenue maps

- **Either called as plans when prepared in larger scales, of a smaller land area.**

- **Usually contain the details of land property.**

- **Scales:-**
  - **1:4000**
  - **1:5000**
  - **1:10000**

- **Authority:- Departments of Survey and Land Records, Under State Governments.**

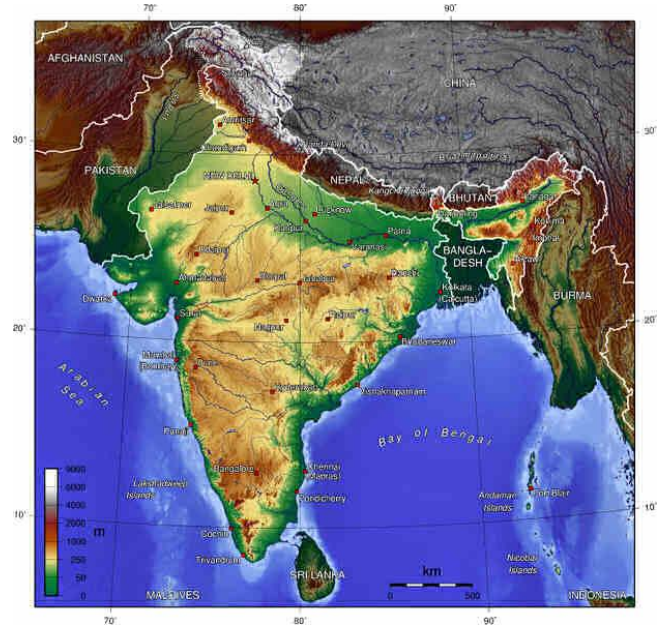


Geographical maps

- They are still smaller maps than 1:250,000.
- They cover an area, like country, state etc.
- They are the basic tools for preparing thematic maps.

Atlas maps

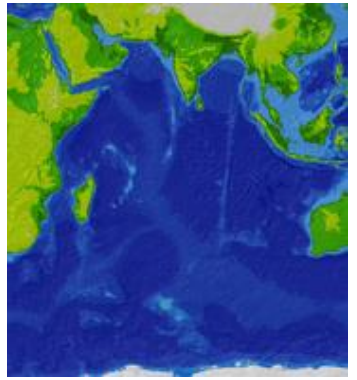
- Smaller maps than geographical maps.



Map classification based on content and purpose

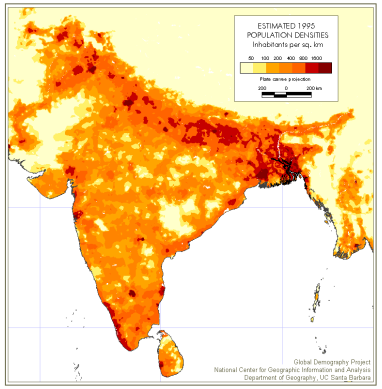
Physical:-

Relief maps, climatic maps, weather maps, bathymetric maps, vegetation maps, geological maps and maps with various other themes.



Cultural:-

Population, ethnography, linguistics, economy, commerce, industry, history, communication etc.

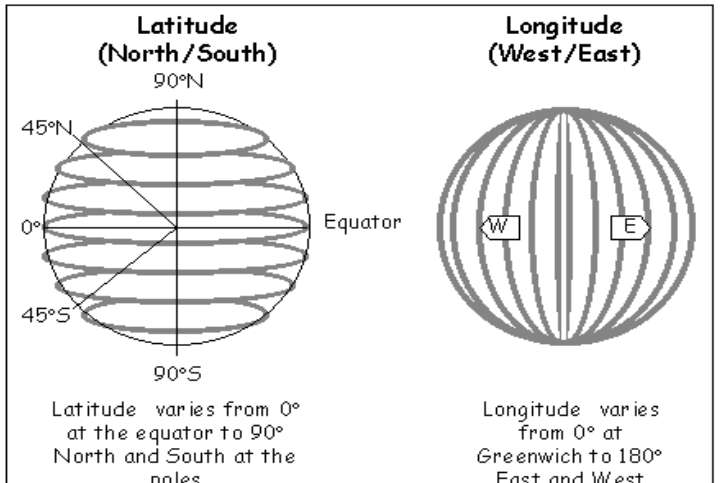


MAP Coordinate system

A coordinate system is a standardized method for assigning codes to locations so that locations can be found easily. Good example is Latitude (LAT) Longitude (long) system.

Latitude: specifies the north-south position of a point on surface of Earth. Latitude is an angle which ranges from 0° at the Equator to 90° (North or South) at the poles. Reference being equator.

Longitude: specifies the east-west position of a point on surface of Earth, measured as the angle east or west from the Greenwich Prime Meridian, ranging from 0° at the Prime Meridian to +180° eastward and −180° westward.



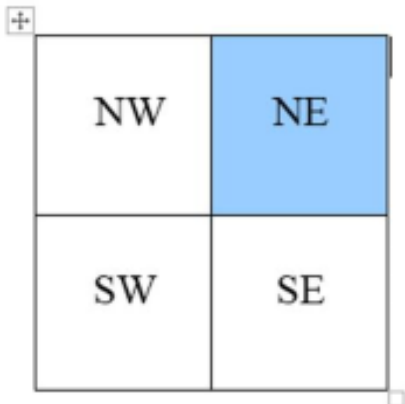
Examples of Scales: 57/H/9/NE – 1:25000 map of North east area of Bangalore, 57/H/9 – 1:500 Bangalore,

Map: 57 indicate 1:1 million, 57/H -1:250,000 shows the district, 57– 1:100000 covers Indian sub

Map Numbering

A	E	I	M
B	F	J	N
C	G	K	O
D	H	L	P

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16



57 - 4^0 x 4^0 on 1:1M scale Shaded cell shows 57 J of scale 1: 250000	57 - 1^0 x 1^0 on 1: 250000 scale Shaded cell shows 57 J/12 of scale 1:50000 scale	57 - 15' x 15' on 1: 50000 scale Shaded cell shows 57 J/12/NE of scale 1:25000 scale

Scanning and digitizing

Map that is obtained is scanned using effective size flat bed position scanners

Scanned data will then be geo – referenced using various tools

Reference Material

- Dr. T.V. Ramachandra, Principles of remote sensing in environmental Management, IISc
- Landsat.org
- Tutorials, CCRS, Canada
- Working with Maps, Survey of India