

Space and Time

Introduction to History
HSS343a

Space

How do we experience space?

- Today our categories are trained by maps
- Think of people who have not seen maps
- Think of the skills involved in scaling down actual features into a map
- What do these words mean:
 - Space
 - Distance
 - Territory
 - Region
 - Domain

Representing Space

- Geographical Features are not *mere* Nature
- Each feature is infused with meaning
- Each feature represents something moral and emotional
- Representing space is about mapping this world infused with meanings, morals, emotions

Measuring Space

How does one measure space?

- By abstract measures of distance
 - Miles, *Kos*, Kilometres
- By time taken to travel
- By difficulties of approach

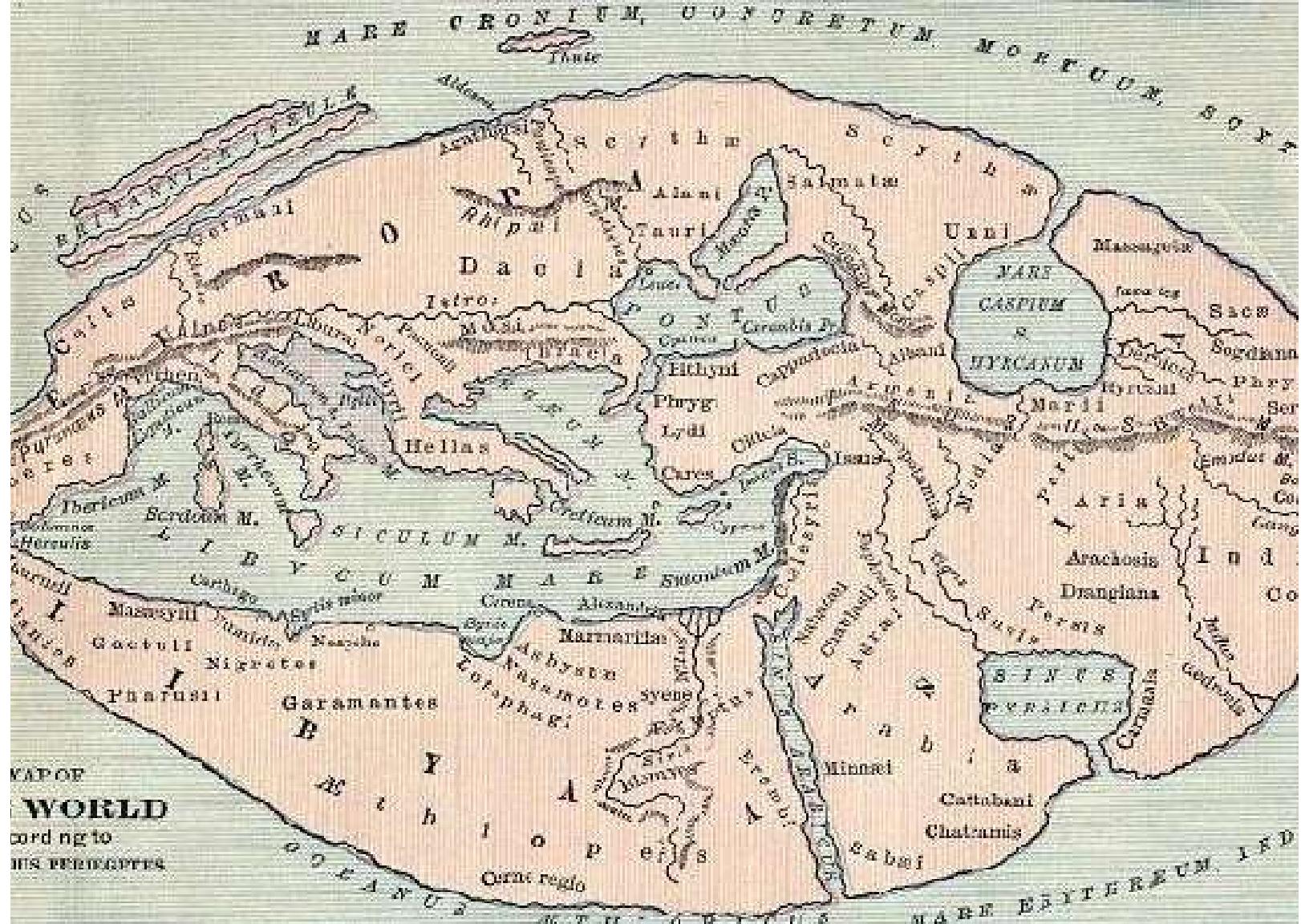


JAMBUDVIPA

This is how “India” and the world was represented in ancient and medieval maps by “Hindu” scholars



Jaina Cosmological map



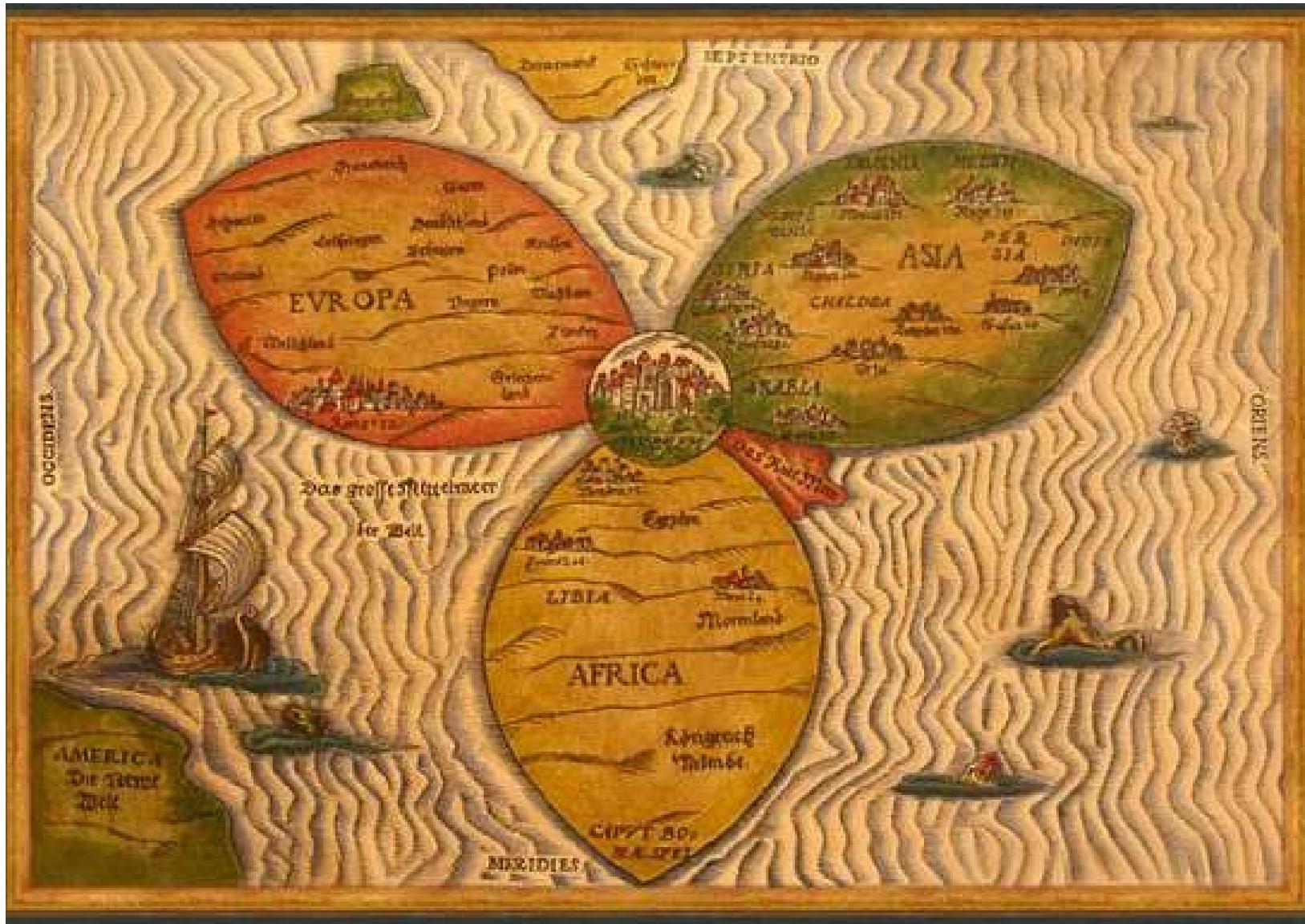
CENTURY BC

Note the attempt at cartographical precision and a map based on evidence from travellers



PTOLEMY WORLD MAP

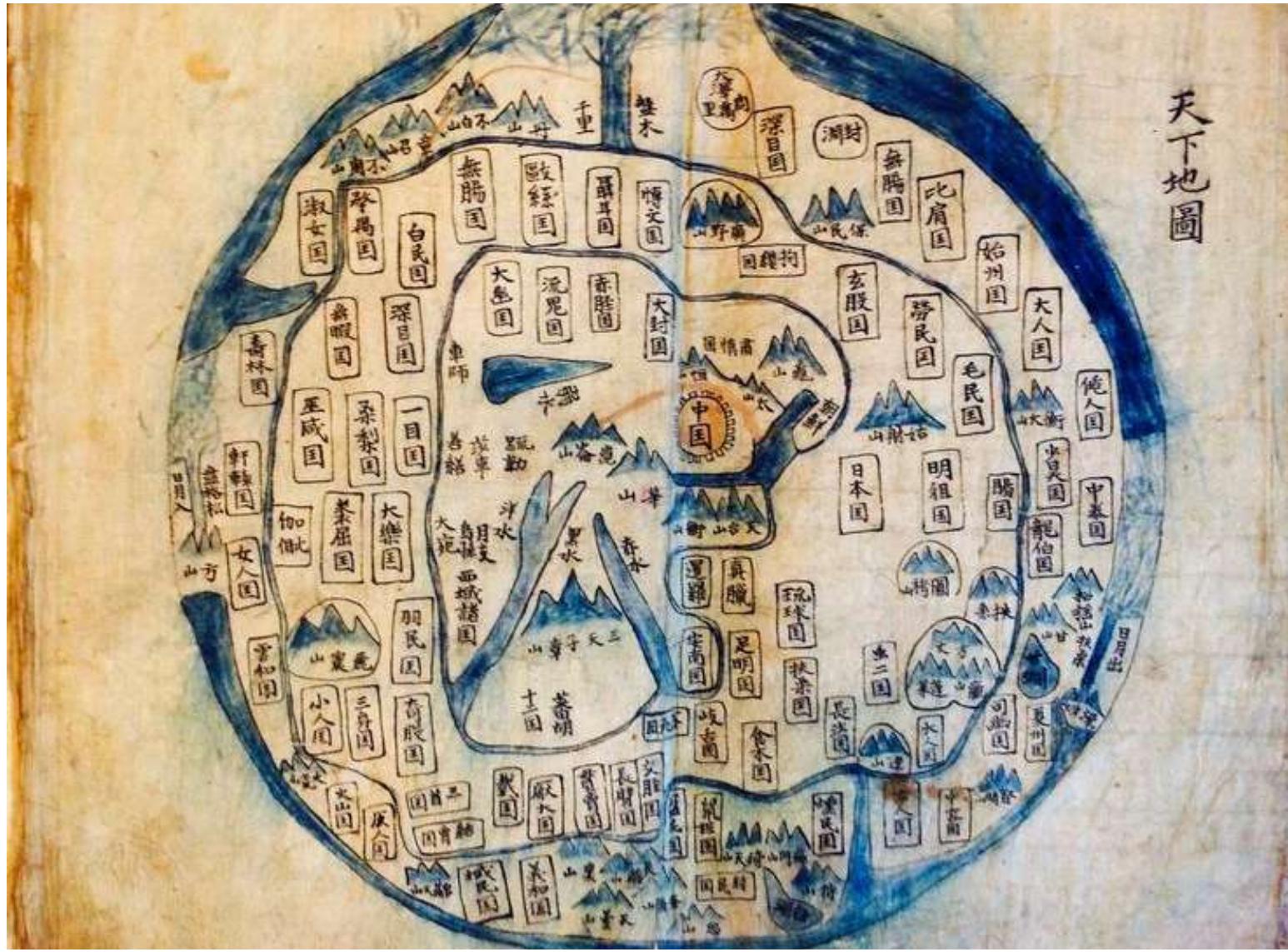
Again, some influence of cartography based on evidence from travellers



MAP OF THE WORLD, 15C EUROPE

Note the conceptual similarity with Jambudvipa

天下地圖



MEDIEVAL KOREAN WORLD MAP

It is almost a copy of the cartography of Jambudvipa



1154

Drawn for Roger II, king of Sicily



INDIA ORIENTALIS, 1611
Map Drawn in Amsterdam



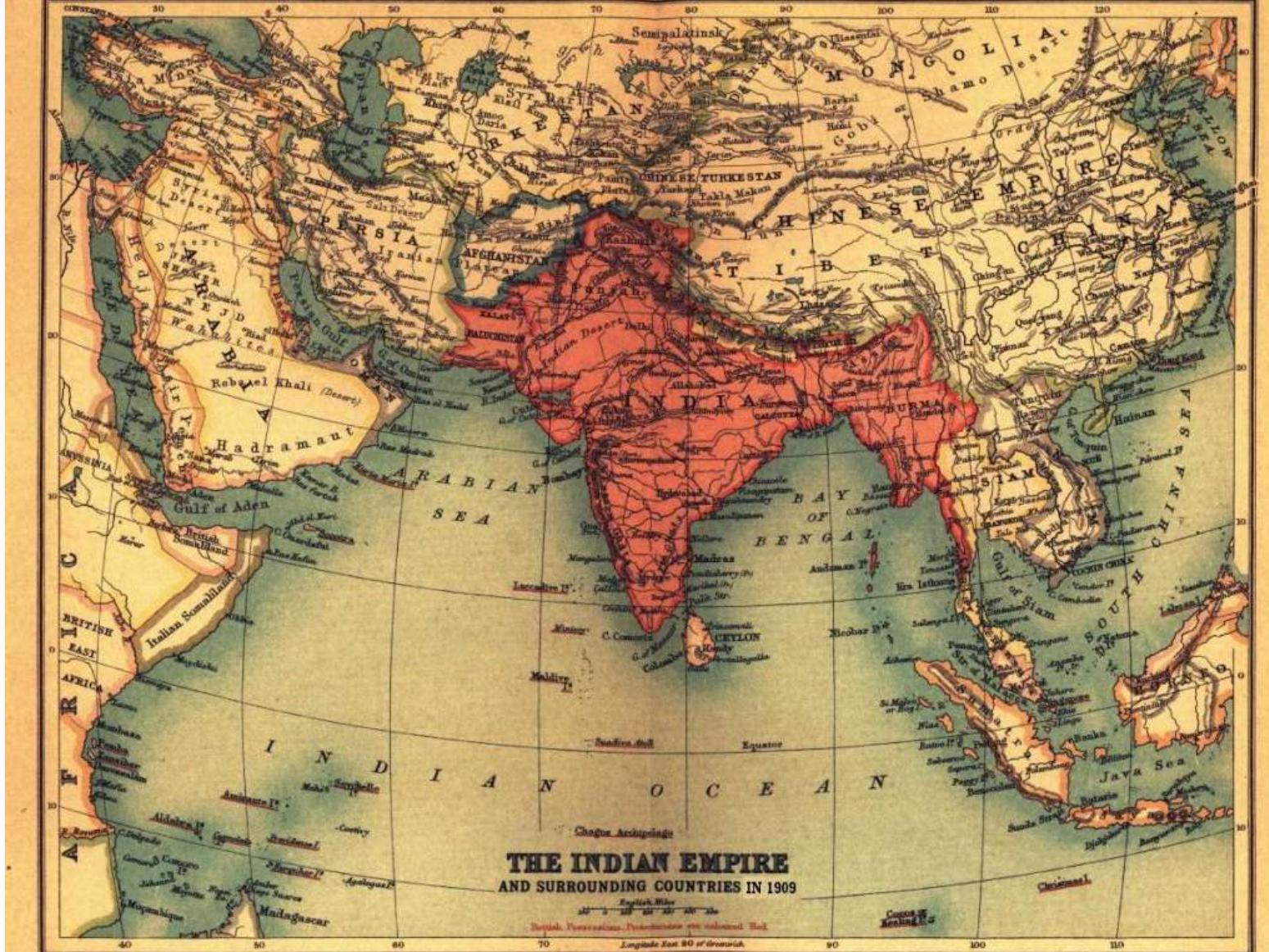
PERSIA AND INDIA, 1747

Map drawn in London ten years before the battle of Plassey



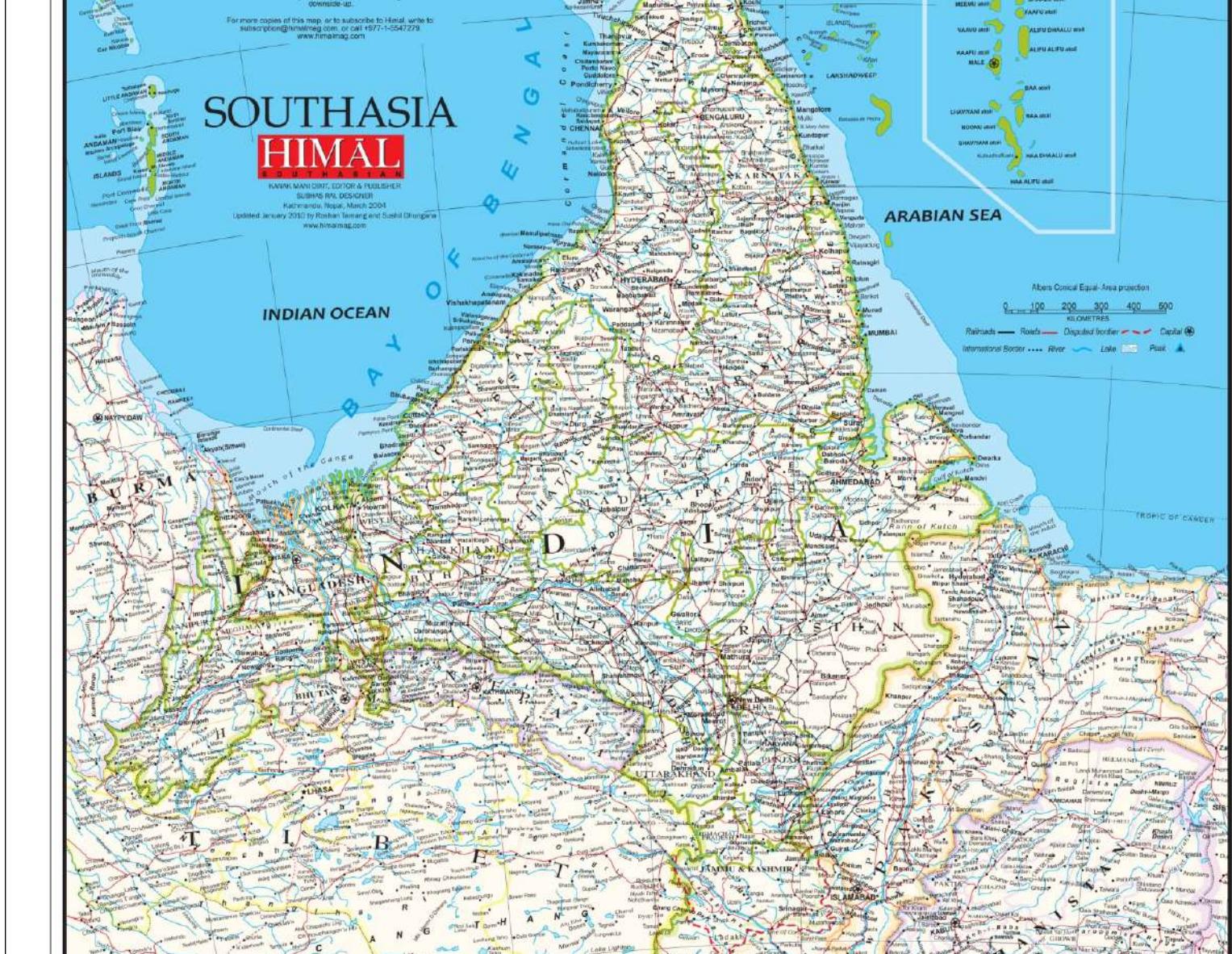
EUROPEAN EMPIRES IN ASIA

Map drawn in the second half of the 19th Century (according to Mercator projection)



1909

It was only in the late 19th and early 20th centuries that India's cartographic visual look came to be what we recognise today.



COMMENTS?!

There is nothing fixed in our own conceptions of space and territory

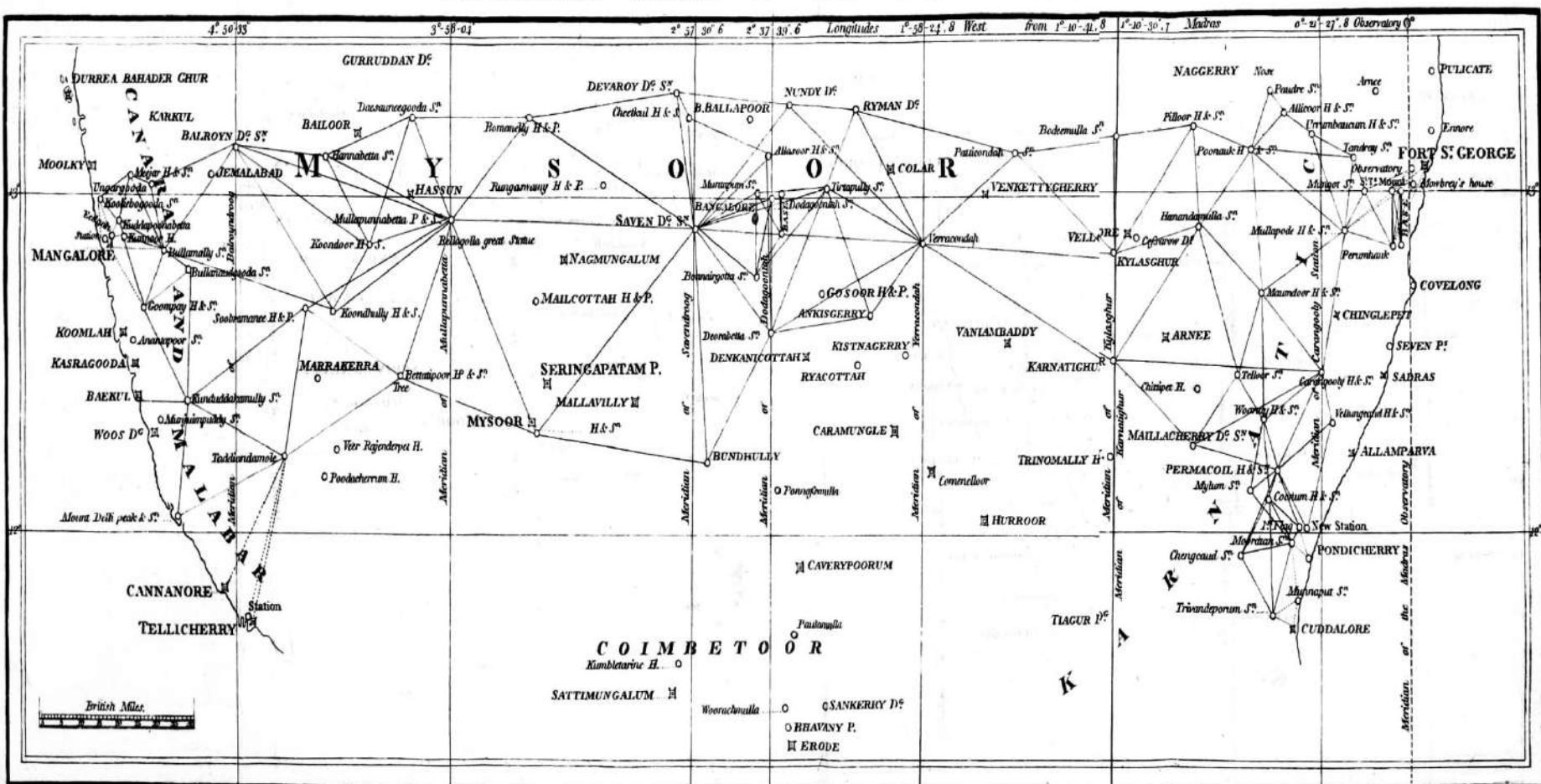
Technology of the New Maps

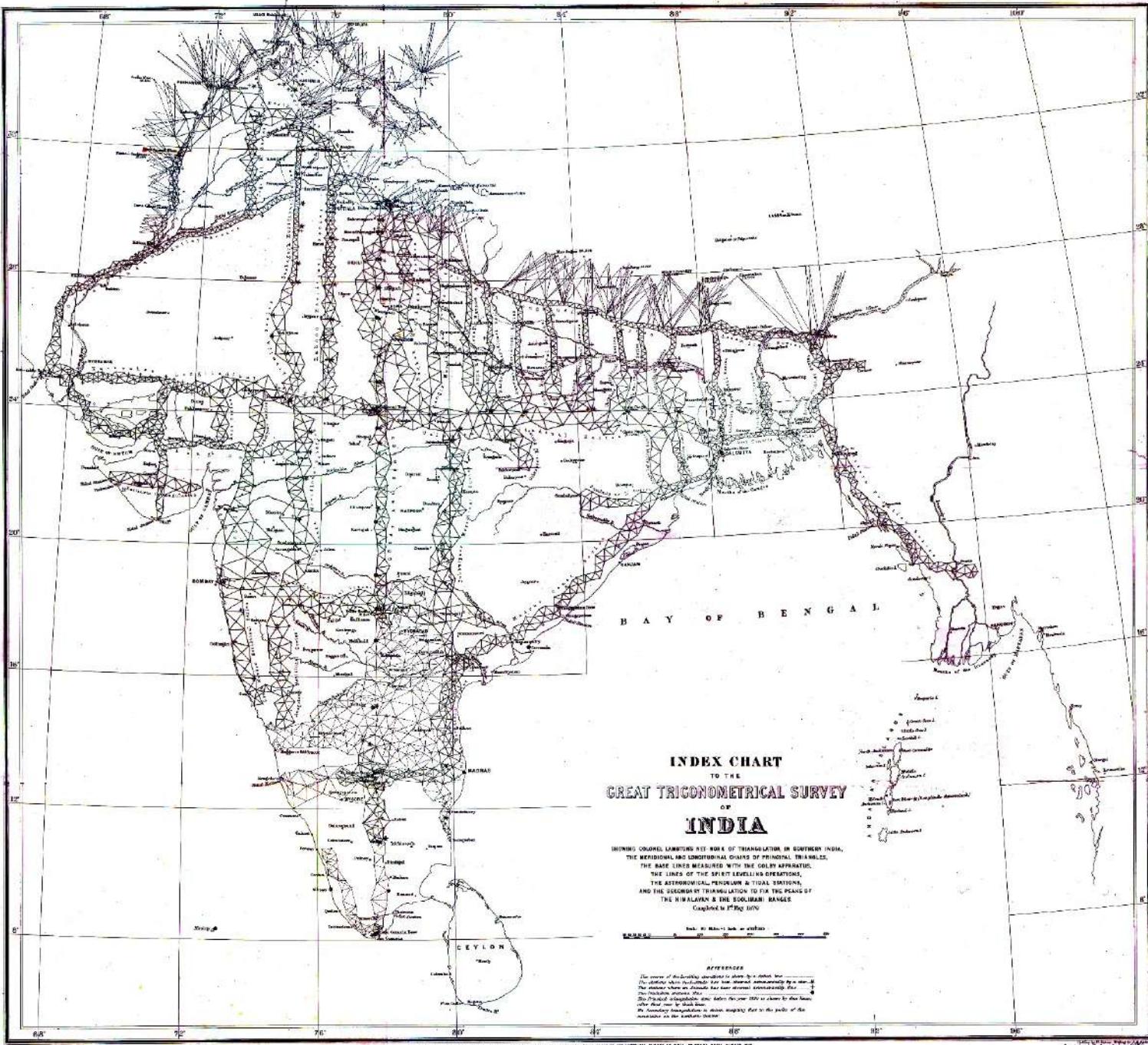
- Cadastral Maps
 - (Re) Emerged in early modern Europe
 - Clear identification of land among private owners
- Trigonometrical Surveys
 - Mapping entire territory using geometry after identifying a single base length
 - Great Trigonometrical Survey of India (1802-1872)
- Latitude and Longitude
 - Latitude based on scientific calculations of Sun position
 - Longitude is a political decision

First Triangulation

Madras to Mangalore through Mysore

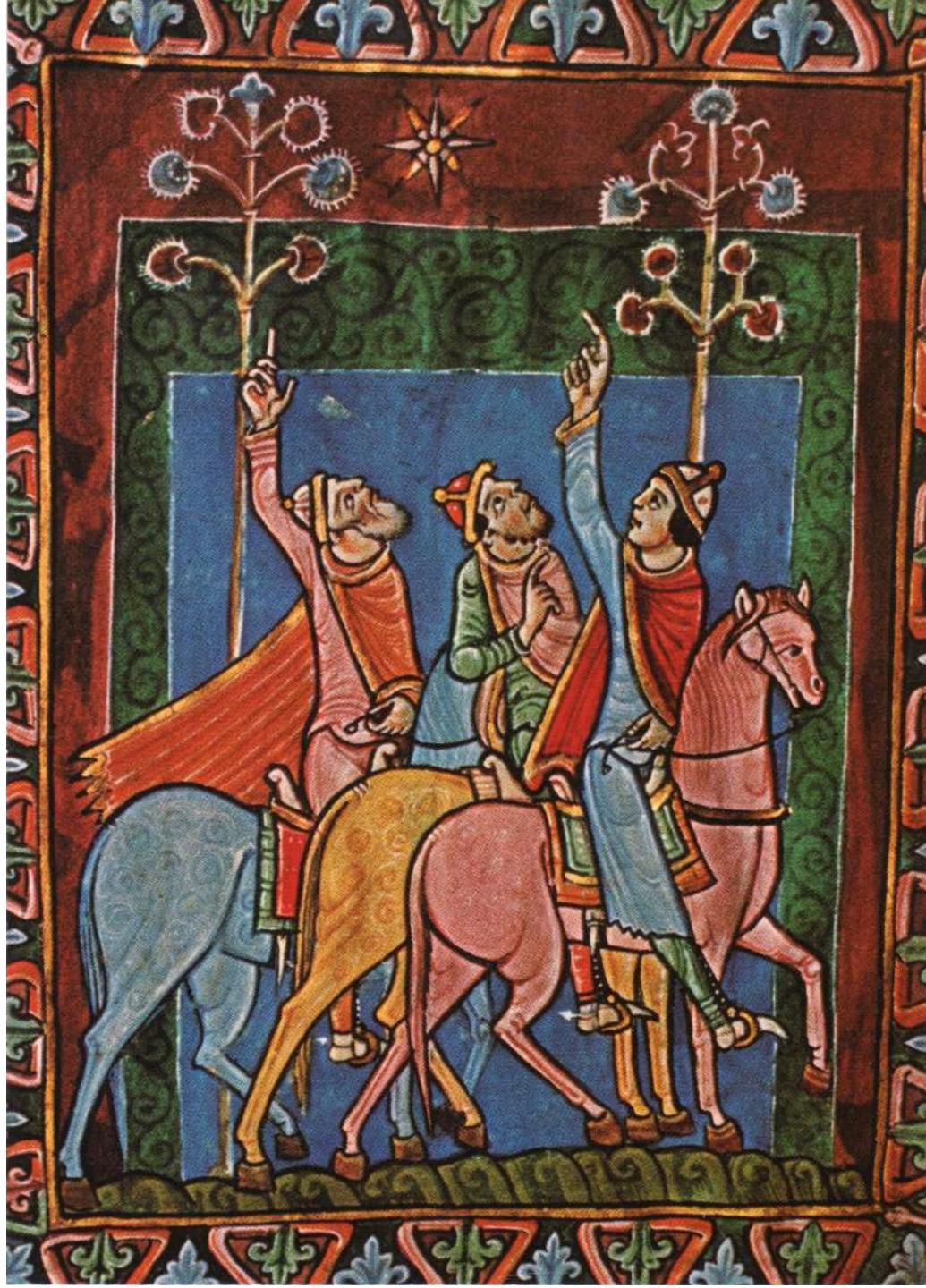
GENERAL PLAN OF THE TRIANGLES.





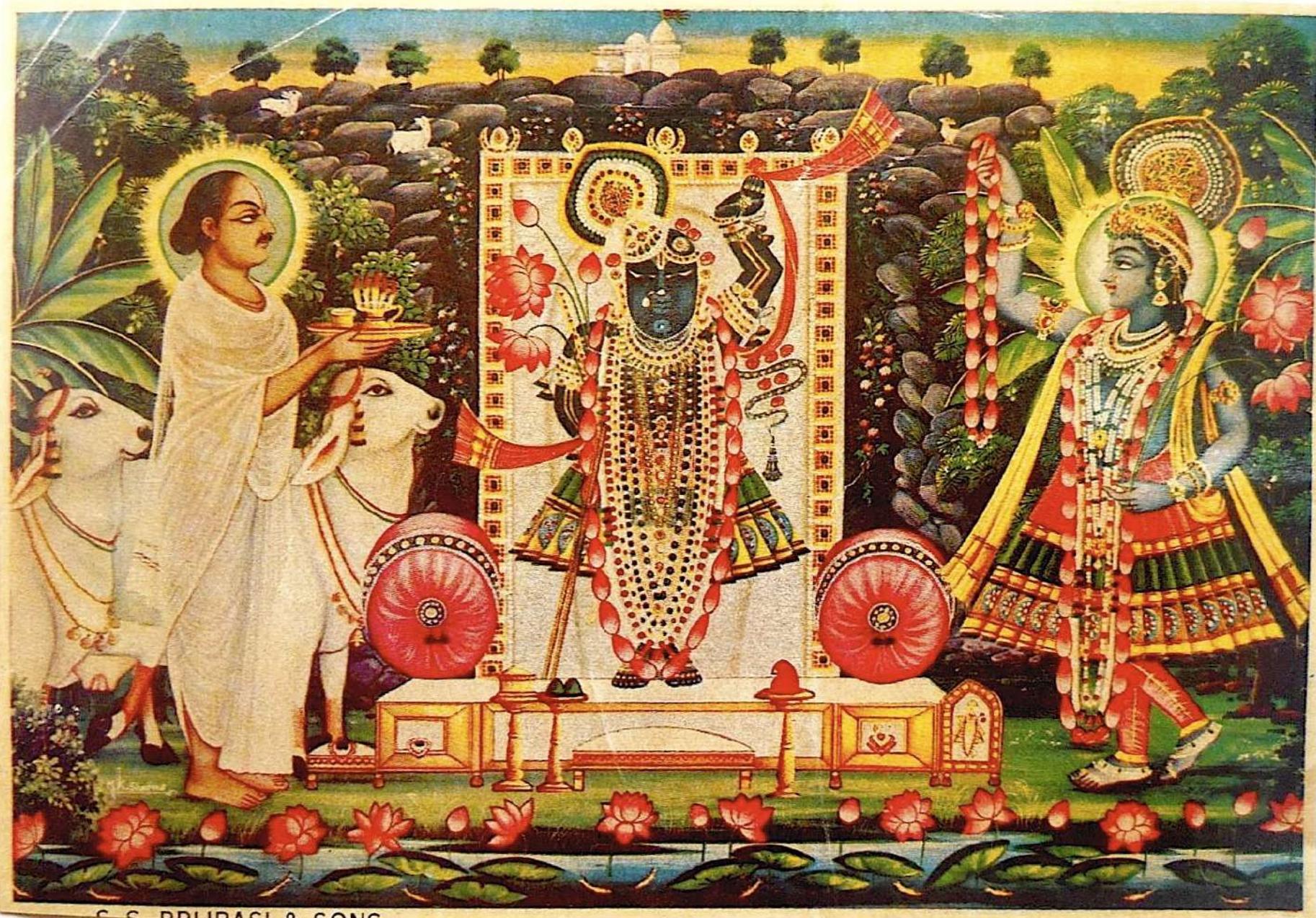
Dimensions of Space

- How we visualise (conceptualise) space
- How is time embedded in space
- We normally think of these as a move from 2D to 3D
- Illustrations of the changing conception of time and space over the past five or six centuries









C. C. PRILAS & SONS

How many Dimensions to Space

Two Dimensional view

- Events from different spaces shown together
- Events from different times shown together
- Time stands still even when events move

ETERNAL

- But there is a third dimension
 - Moral and emotional, a dimension of meaning which is *supra*-natural

ARCHAIC CONCEPTION OF TIME

Empty Space, Moving Time

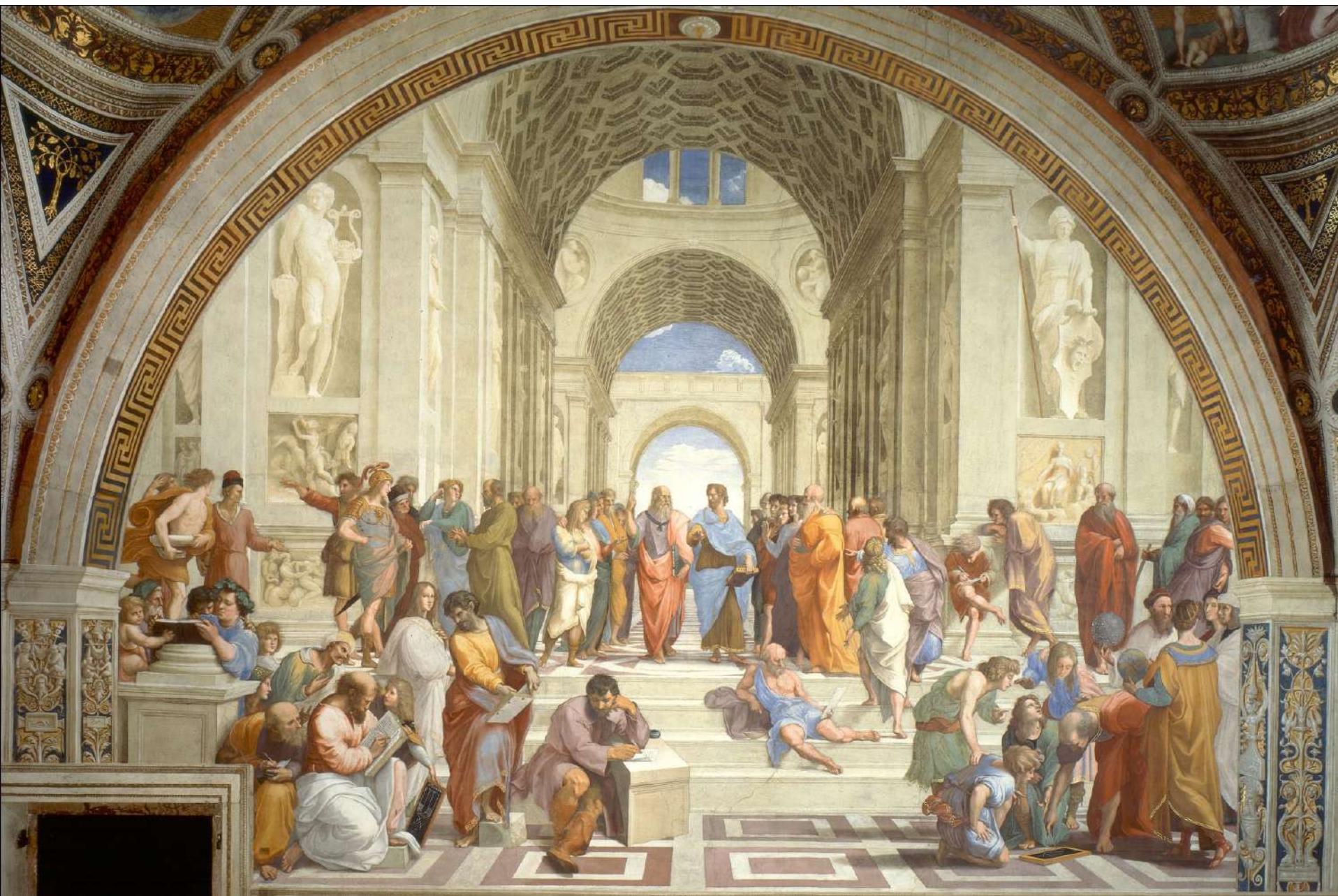
- Space is emptied of meaning, emotions, supernatural aspects
- What is gained
 - Perspective
 - Time as motion
- Enumeration of Time and Space
 - *Mere* numbers

MODERN CONCEPTION OF TIME & SPACE



OilPaintingFactory.com

Topnotch Art



Notice the shift over the next three paintings

The three paintings are of the same topic:
Madonna and Child (Jesus)

These paintings span a period of about 150 years of late
medieval and early modern Europe







Notice the shift in the following two paintings

Same scene:

Raas Leela of Krishna





Points to Note

- 1) The new conception of time
 - a) Time flows and we can capture only one moment
 - b) All action – Divine or Human – inside time
- 2) The new conception of space
 - a) Three dimensional
 - b) Size and shape correspond to reality
 - c) What the eye sees: REALISM

HISTORY IS: WHAT REALLY HAPPENED

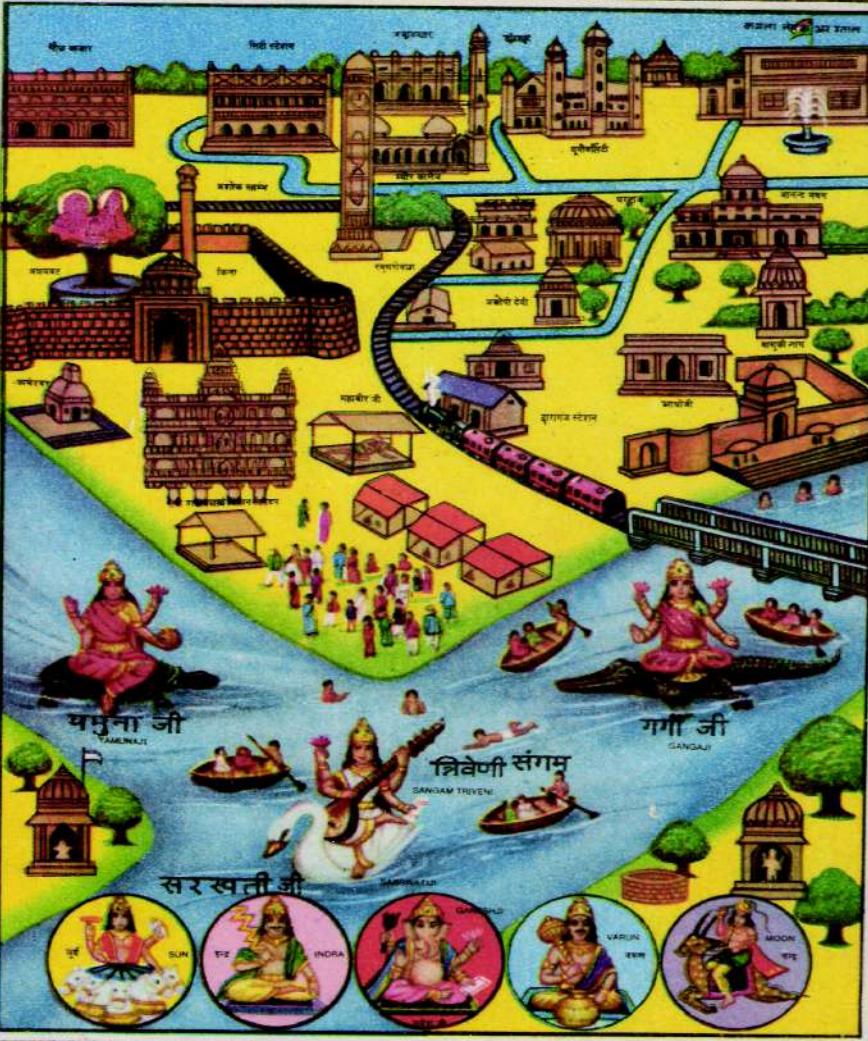
So then, what does it say about present day India if we still have the following representations of time and space common among our people?



TIRTHRAJ PRAYAG MAP

तीर्थराज प्रयाग का नकाशा

असली प्रामाणिक दर्शनीय स्थलों की वित्रावली सहित
चित्र कार्नर, 173, पानवरीबा इलाहाबाद (उ.प्र.)



Does this give us hints about how many people in India still see time?

(In other words, how people perceive history)

Perception of Time

- How do we measure time
 - Individually
 - As a polity and society
 - As a civilisation
- What units measure Time
- Who measures Time
- Who controls Time

Pre-Modern Idea of Time

- Time is Eternal, Divine, Immeasurable
- What units?
 - Divine actions, aka stages of creation
- Who measures?
 - Divine Law
- Who controls?
 - God's representatives: priests, astrologers



Typical Rural Church, Medieval Europe



Church Tower dominates the city



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ID 61986022

CLOCK TOWER, BERN, SWITZERLAND

Low tower, enclosed space for merchants and guildsmen



© Douglas Pearson/Getty

PRECISION OF THE CLOCK



BERN PANORAMA

Notice the dominance of the Church Towers
Clock Tower is nowhere to be seen.



The major trade centres saw merchant power rising and taking control of time



Merchant power reached its pinnacle in Venice

Change in Time

- Rationalisation of Time
 - Fixed hours, even minutes
 - Currency and Finance
 - Each unit of time same as the other
 - “Waste”, “gain”, “lose” time
 - “Use” time.... Usury
 - Secularisation of Time
 - Not owned by God, but fixed by common consent
- TOOK FIVE CENTURIES TO STABILISE

Longitude

- Political Issue
- Along with trade and mercantilism, important contributor to secularisation of Time
- Where is the prime meridian 0°
- How does one calculate one degree Longitude
 - Galileo's Moons of Jupiter (1612 AD)
 - Lunar calculations and Almanac
 - John Harrison's Marine Chronometer

Universal Time

- 1884: International Meridian Conference
 - Fixed Greenwich as zero longitude
 - One time for the entire globe
- Travel rationalised
- Global business transactions
- “Backward Linkage”: Calendar universalised

Indian Calendar

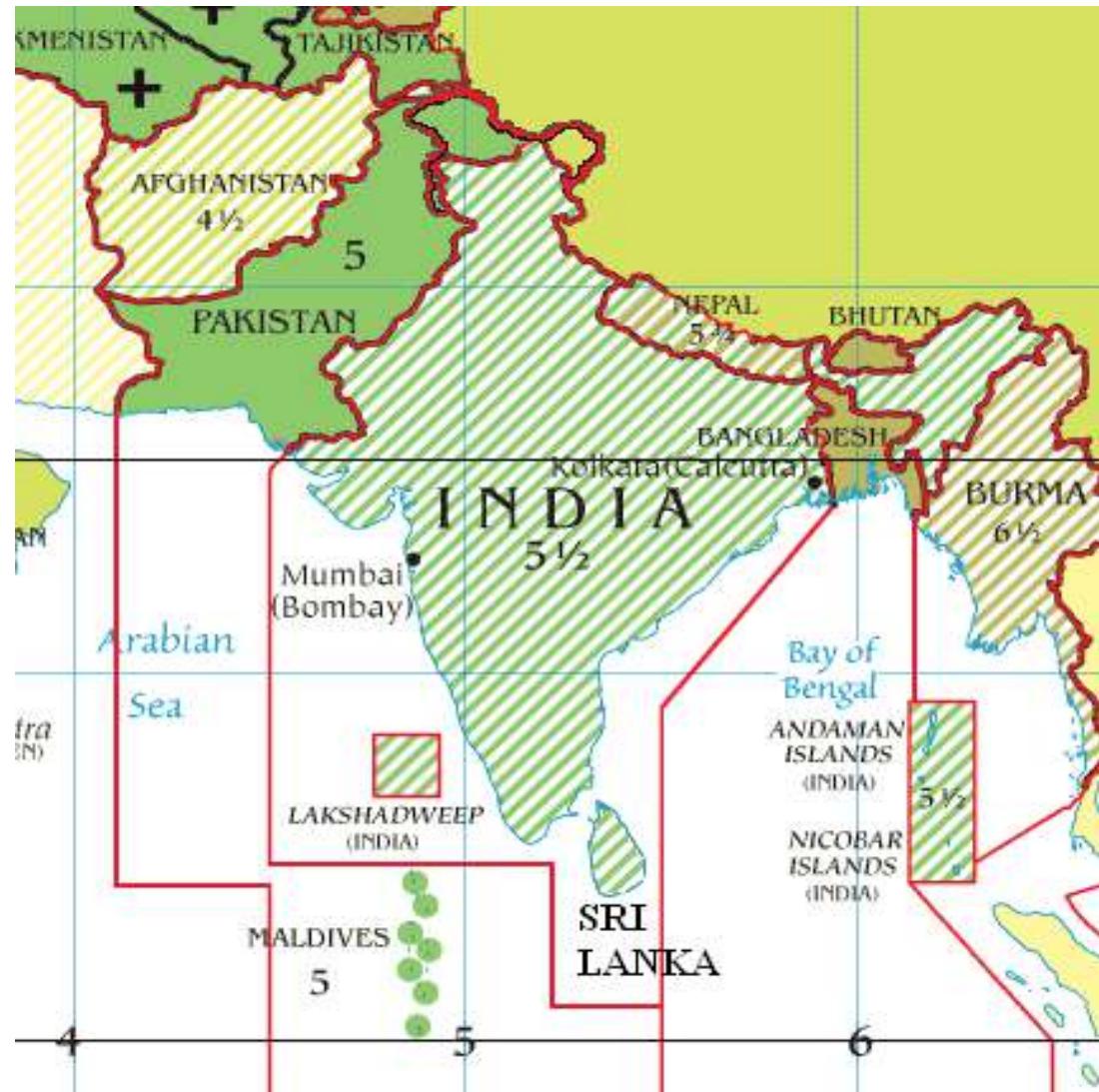
- Old Indian Calendar: Luni-Solar
 - Vikram Samvat (57 BC)
 - Saka Samvat (78 AD)
- Mughal Calendar under Akbar
 - Combined Islamic Lunar calendar with Hindu Luni-Solar calendar
 - New year starts with Spring Harvest
- Financial Year and Calendar Year

Time in India

- Time controlled by religious leaders
- Time controlled every action of individual...
 - Name ceremony, marriage, work, travel, etc
- ...and the community
 - Agriculture, war, policy, trade, etc
- Religion, Social, and Political Authority deeply intertwined with Time

Indian Standard Time

82.5°E
longitude
Shankargarh
, Allahabad
1905



Madras Time

- 1802 by John Goldingham, first astronomer of the EIC.
- 80th Meridian East from Greenwich
- 9 minutes in time (~2 degrees longitude) away from what became IST point
- Became the basis of Railway Time
- Communicated through telegraphs (1860s) from Madras Observatory all across railway network

Bombay Time

- Formally established in 1884 at International Meridian Conference
- Based on 75th Meridian
- 4 hours 51 mins before GMT
- Continued till 1955
- Balgangadhar Tilak and Pherozshah Mehta opposed shift from Bombay time to IST in 1906

Calcutta Time

- Also established at the 1884 International Meridian Conference
- Based on 90th Meridian
- 5 hours 54 mins ahead of GMT
- Continued till 1948
- Used as standard for scientific measurements
 - Astronomical and geological measurements

Indian Standard Time

- Proposed in 1884
- Established in 1905-06
- Railway time shifted to IST
- 29.8 deg (West) Baluchistan
- 101.1 deg (East) Burma
- 290 mins(4 hrs 50 mins) of time difference
- Even after Partition 29 deg longitudes between India's western and eastern points
 - 1 hour 56 mins