Empire Era

Tribal
- Farming: 11,000 BCE

Empire
- Cities: 3500 BCE
- Renaissance: 1500 CE

Planetary
- Now

Agriculture – Hierarchy – Literacy
Largest Settlements

Inhabitants

Year

-4,000 -3,000 -2,000 -1,000 1 1,000 1,700

First Cities

Rome

Chang’an

Kaifeng

Hangzhou
Later Empire Era Inventions:

- Coal for smelting (China)
- Horse saddle (Eurasian nomads)
- Watermill (Greeks)
- Papermaking (China)
- Advanced mathematics (Islamic & India)
- Printing (China)
- Advanced astronomy (Islamic)
- Gunpowder (China)
- Compass (China)
The Empire-To-Planetary Transition

- Tribal
  - Farming: 11,000 BCE
- Empire
  - Renaissance: 1500 CE
- Planetary
  - Cities: 3500 BCE
  - Now
Innovation Seen As An Asset

• “Innovation” includes technological, social, economic, philosophical change

• Innovation has always been a factor

• Europe best positioned to lead on using innovation in 1500 CE
Innovation’s European Dynamics

- Multiple Centers Of Power
- Dependence On Technological Superiority
- Local Arms Race
  - Accelerates Europe's Advantage
  - Costs Increase Dependence On Commerce
  - Commerce Benefits From Tech Advances
  - Power Spreads To Commercial Elites
  - Commerce Expands
Process Is Self-reinforcing

Innovation's European Dynamics

Commerce Expands

Commercial Competition Drives More Innovation

Demand For Literacy Grows

Old Knowledge Authorities Undercut

Deference To Old Elites Diminishes

Religious, Political and Social Innovations Emerge

Process Is Self-reinforcing
## The Empire-To-Planetary Transition

<table>
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Communications Level of Development

- Expansion of travel
Age Of Discovery Voyages
Communications Level of Development

- Expansion of travel
- Expansion of literacy
World Literacy

UN data

S-curve fit

50% in 1943

84%

Percent of Literate Adults

Year

1900 1950 2000 2050
Communications Level of Development

- Expansion of travel
- Expansion of literacy
- Increase in speed of communications
- Beyond language: multi-media, multi-sense
- Increase in person-to-person access
World Bank: 75% of humanity had access to a cellphone in 2012.
Cellphone Subscriptions

A billion smartphones sold in 2013, exceeding feature-phone sales.
28% of humanity age 15 and older had smartphones by the start of 2014
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More People Get More Choice

* occupation
* place of employment
* political leaders
* friends and associates
* marriage partners
* where to live
* information sources
* beliefs
* goods and services
Two Responses To More Choice

• A shift to more indirect, covert and psychological methods of control

• The growth of self-organized consensual collaboration
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We Are In A Different World

Billions of People

Year

Ecologically Full Earth, Communications Small World

Earth's "Business As Usual" Carrying Capacity

Farming

First Cities

Renaissance

Rome