

Industrialization

Why not “Industrial Revolution”?

- Areas industrialized at different times, while “Revolution” implies sudden change.
- “Revolution” suggests sharp break from past, but industrialization was a gradual process
- Roots of industrialization go back to Medieval Period, Abbasid Caliphate, Song China
- “Industrial Revolution” almost always associated with Western Europe and the US only

Why would we call it a revolution?

- Qualifies as a “marker” event in that it helps periodize history:
 - Crosses national and cultural borders, affecting many civilizations
 - Changes or development in history later can be traced to it
 - It has impact on other areas, i.e. government, belief systems, social classes, and economy

Represents one of a few major economic revolutions:

- Neolithic (agricultural) – c. 10,000 BCE
- Urban (civilizational) – c. 3,000 BCE
- Industrial – c. 1600 – 1800 CE
- Informational – c. 1950 CE
- Biotechnical, Robotic, Artificial Intelligence
-- ???

General Causation

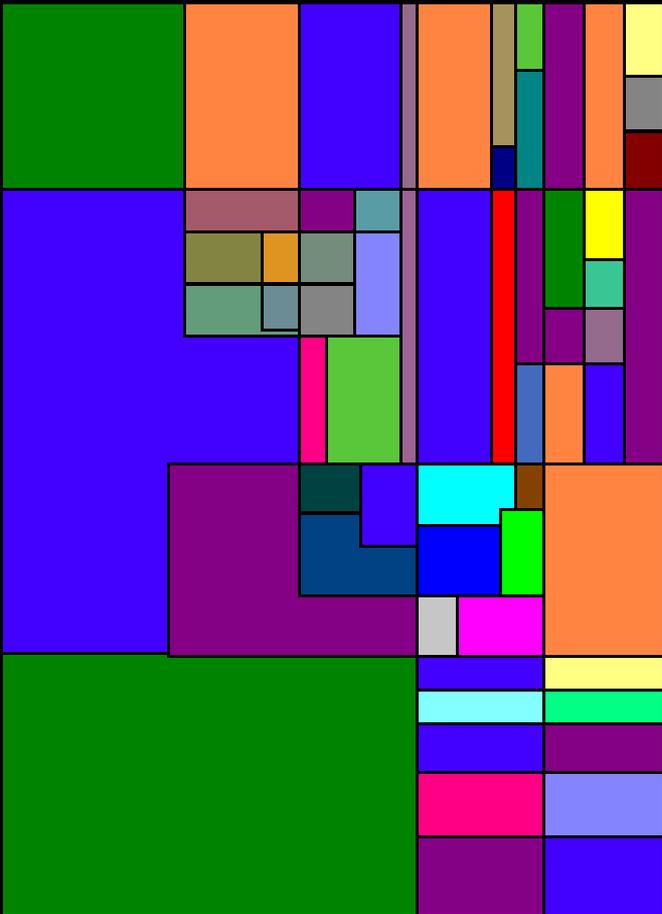
Population Growth

- **Reliable food supplies**
- **Higher birth rates**
- **High percentage of young people**
- **Migration to cities (urbanization)**
- **Migration to Americas**

Causes (cont)

The Agricultural Revolution

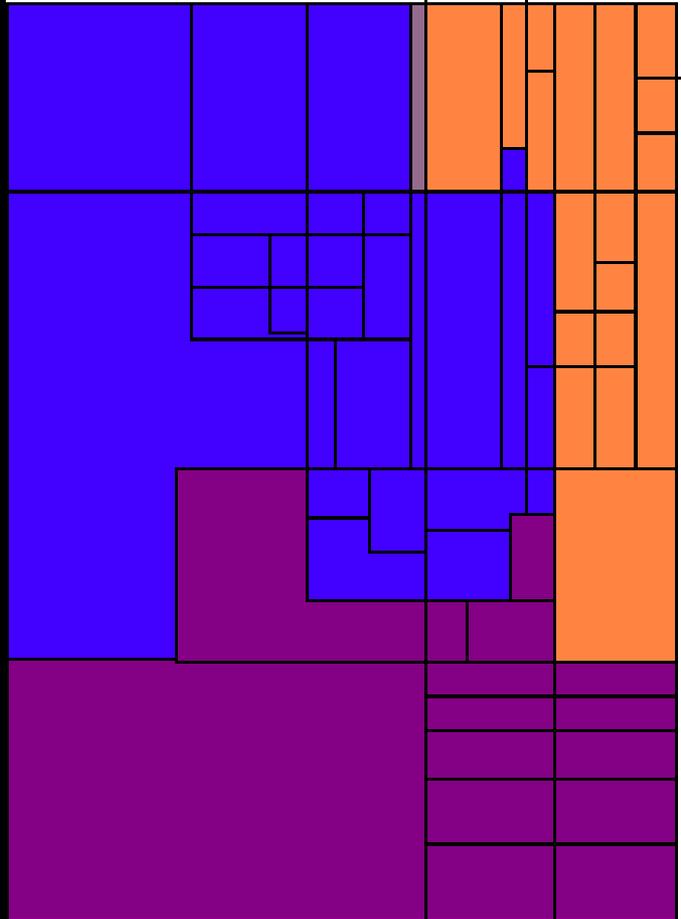
- New Food Crops, Better Productivity**
- Dominance of Wealthy Landowners (enclosure)**
- Rise of Sharecropping, landless labor**



Legend



Other
Colors



Causes (cont)

Trade and Inventiveness

- Increasing Demand**
- Putting-out system**
- Enhanced trade**
- New Technologies and innovation (relationship between science and tech)**

garment making in their own homes. Early 19th-century print of English families sewing uniforms for the British army under the domestic, or putting-out, system that preceded the factory system.



Why it might have started in Qing China:

- Already had coal – back to Yuan dynasty
- Had history of complex machinery, e.g. dragon spine irrigation
- Had mass-production capabilities, e.g. ceramics
- Had robust interior economy
- History of technological innovation, esp. Song – Tang era (gunpowder, paper, etc.)

Why didn't it start in Qing China?

- Massive population (400 million) meant less need for automation
- Conservative government officials; neo-Confucianism
- Underdeveloped industries, esp. mining
- Restricted foreign trade – Canton system
- Excellent waterways meant less need for trains, etc.

Why did it start in Britain?

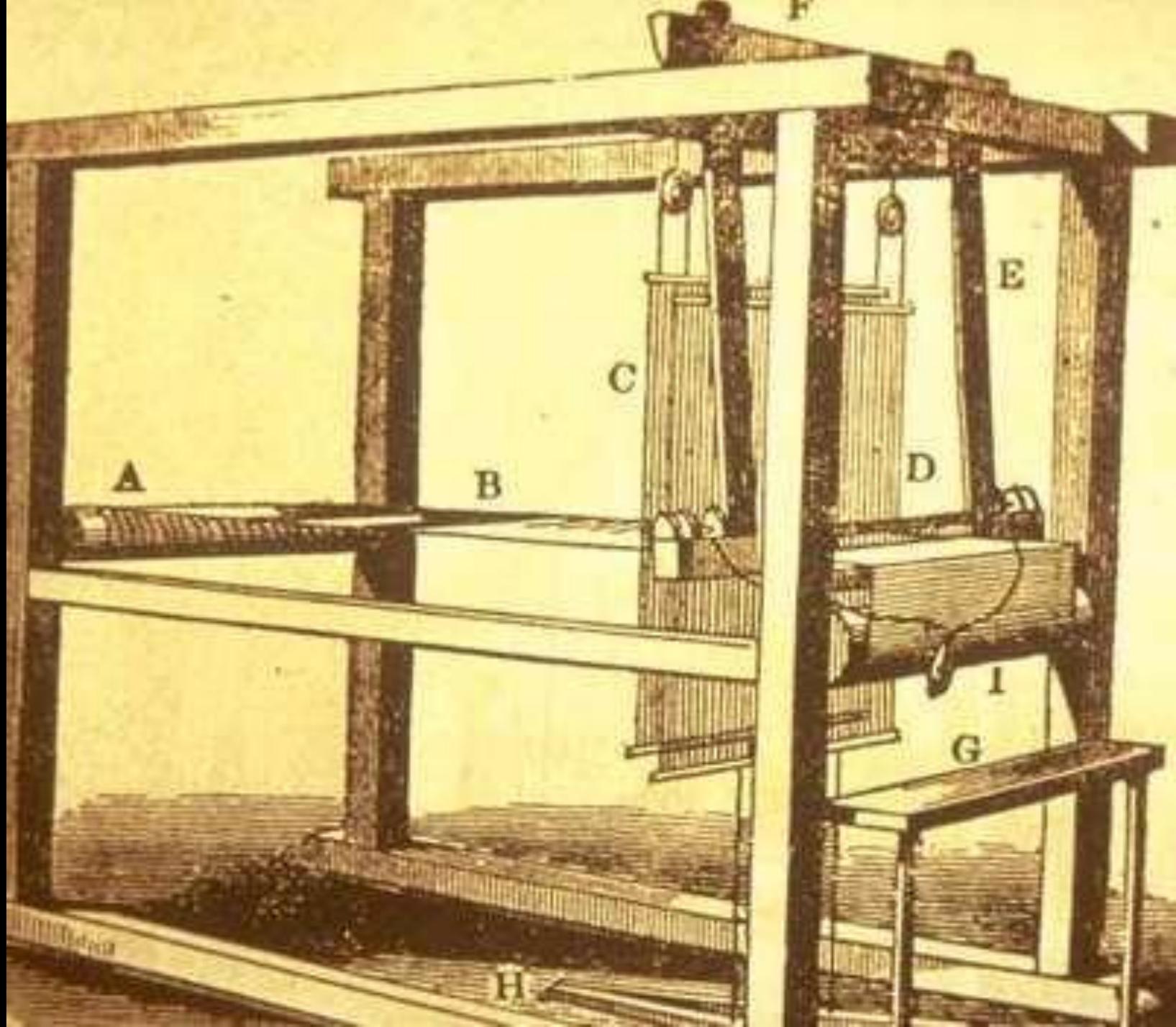
- **Rising Population, social mobility**
- **Strong mining and metal industries**
- **Large merchant marine**
- **Good water transportation**
- **Unified market, strong commercial sector**
- **Technological revolution: key inventions that were “seeds”; core technologies**
- **Political stability; but limited governmental power**

What inventions led to it?

- Textile production was beginning; each invention led to the next
 - Flying shuttle
 - Spinning jenny
 - Water frame
 - Spinning mule
 - Power Loom

Problem: Machines were too big for home, hence could not be done using “putting out” system

Flying Shuttle





Spinning Jenny

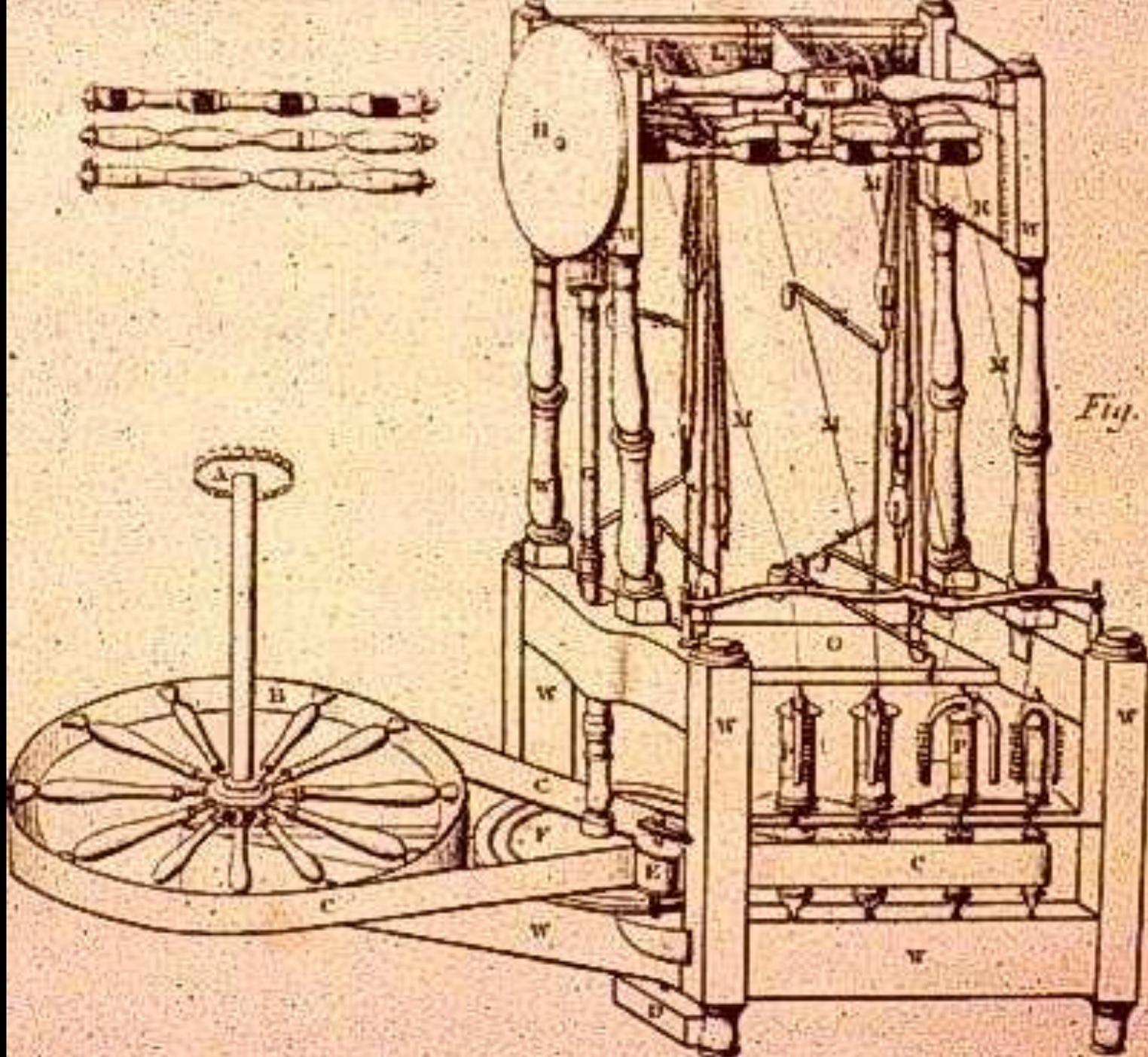


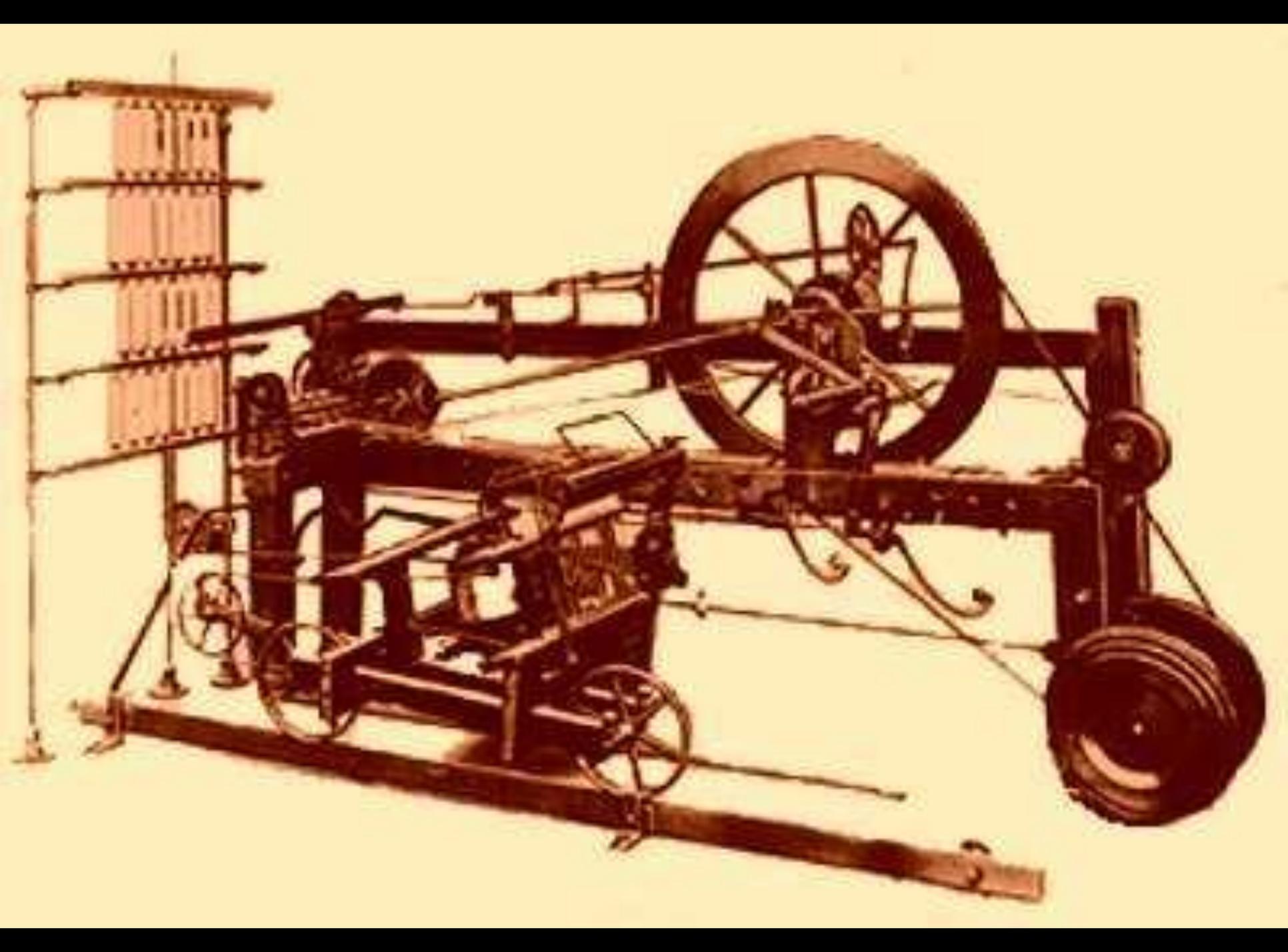
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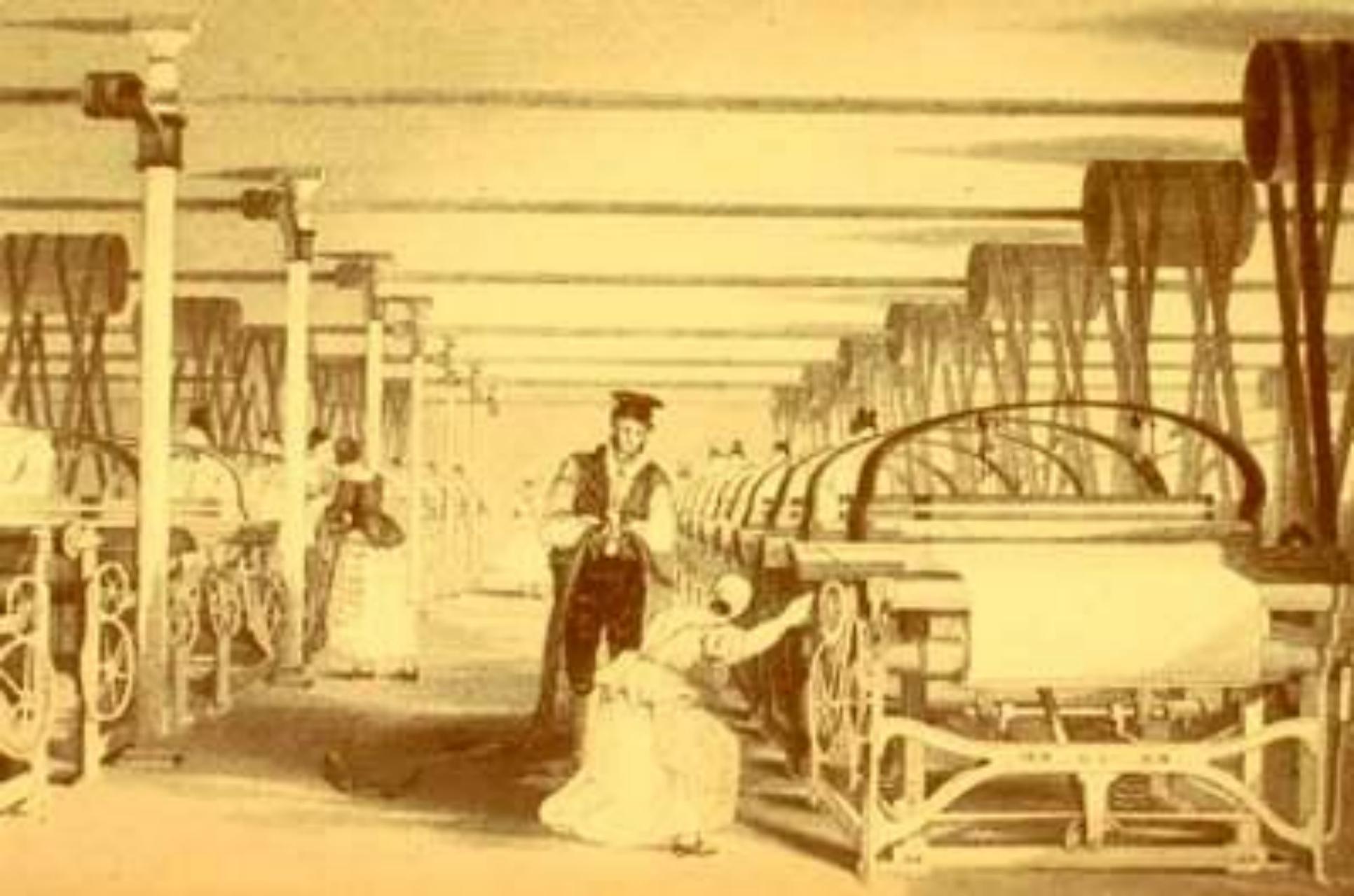
THE DIGNITY OF THE FRANCHISE.

QUALIFIED VOTER. 'AH, YOU MAY PAY TAXES, AN' YOU MAY 'AVE RESPONSERBILITIES AN' ALL; BUT WHEN IT COMES TO VOTIN', YOU MUST LEAVE IT TO US MEN!' October 5, 1905
Punch

Water
Frame







Power Loom

How was industrialization linked to slavery and colonialism?

- Supply of cotton primarily from USA
 - 1790's – 1.5 million pounds/year
 - 1810 --- 85 million pounds/year

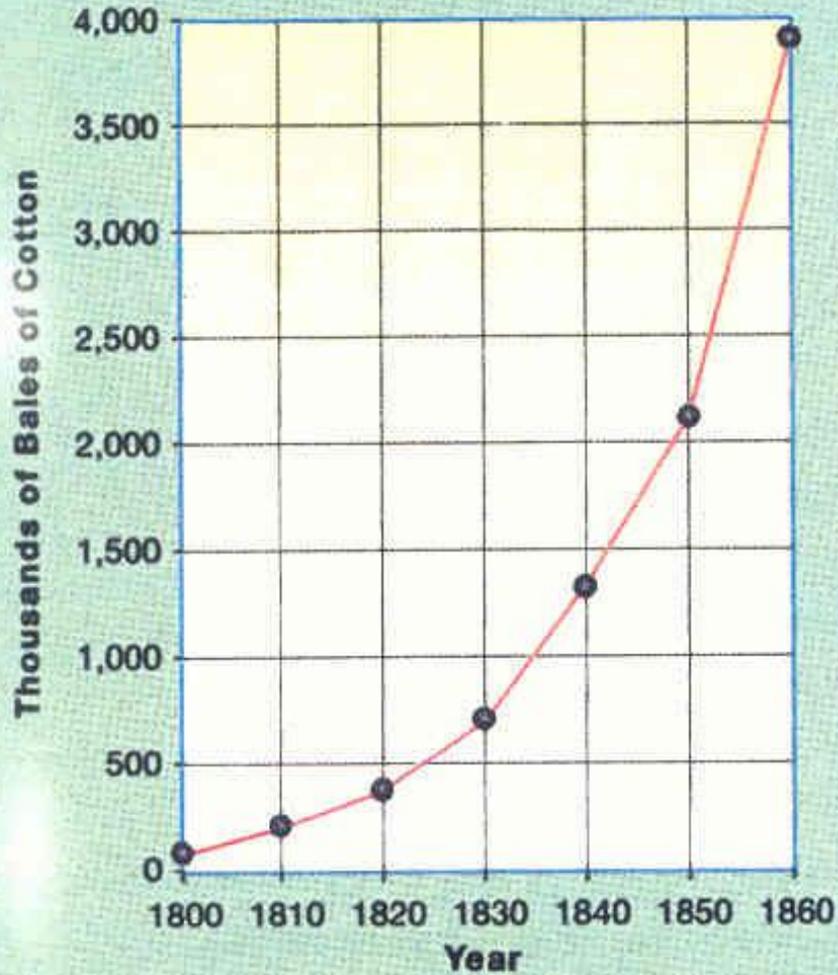
Other source for cotton: India

Impact of technology – Cotton Gin

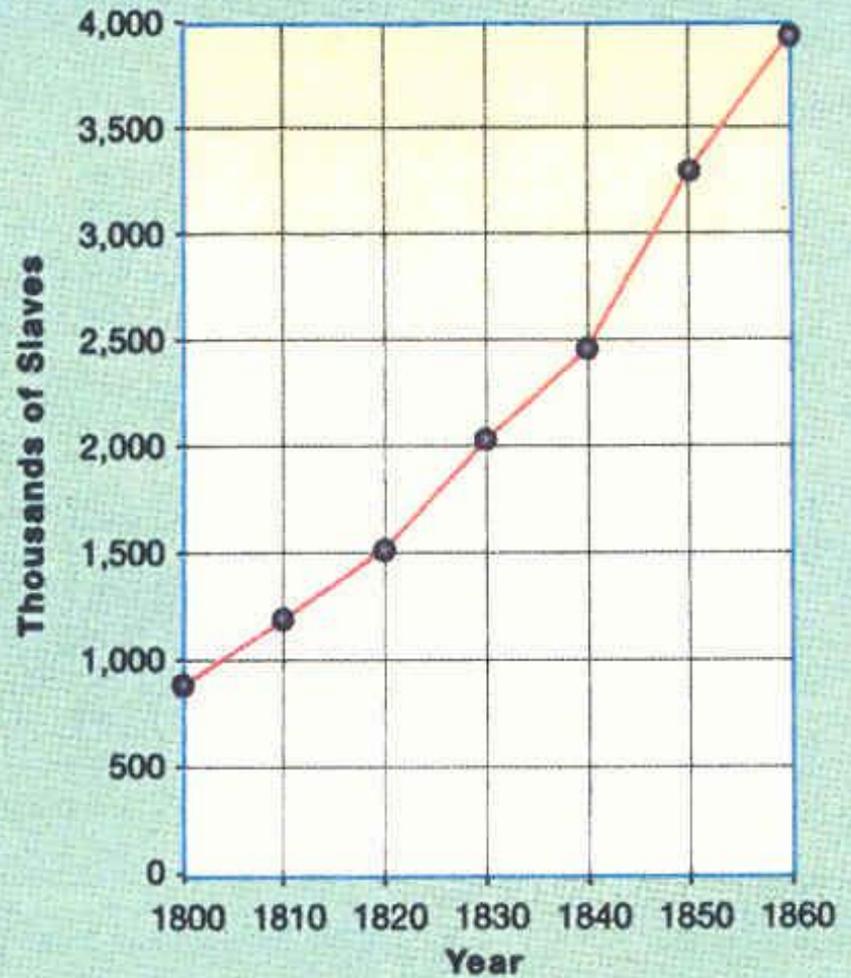


Cotton Production and Slavery

Cotton Production



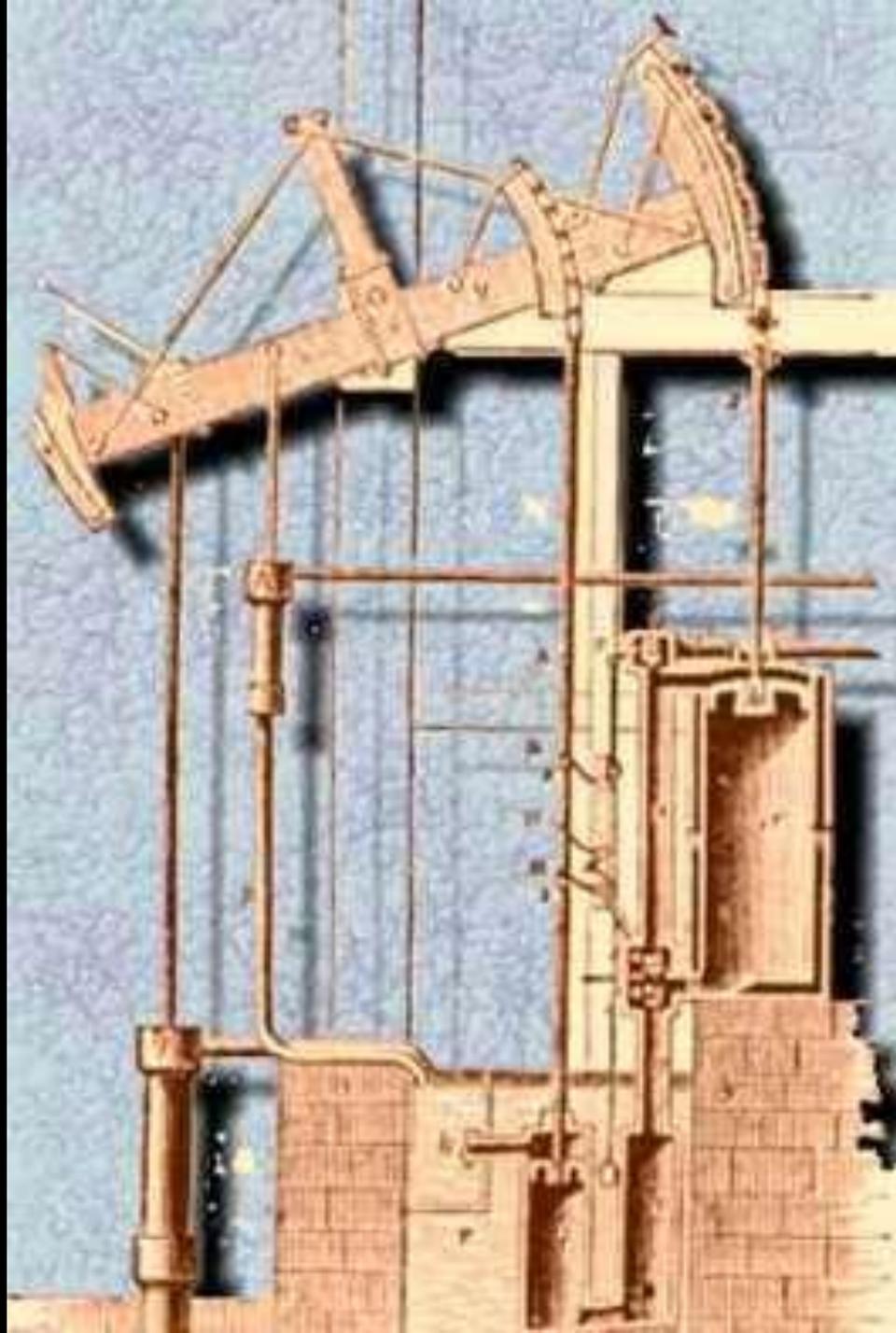
Growth of Slavery



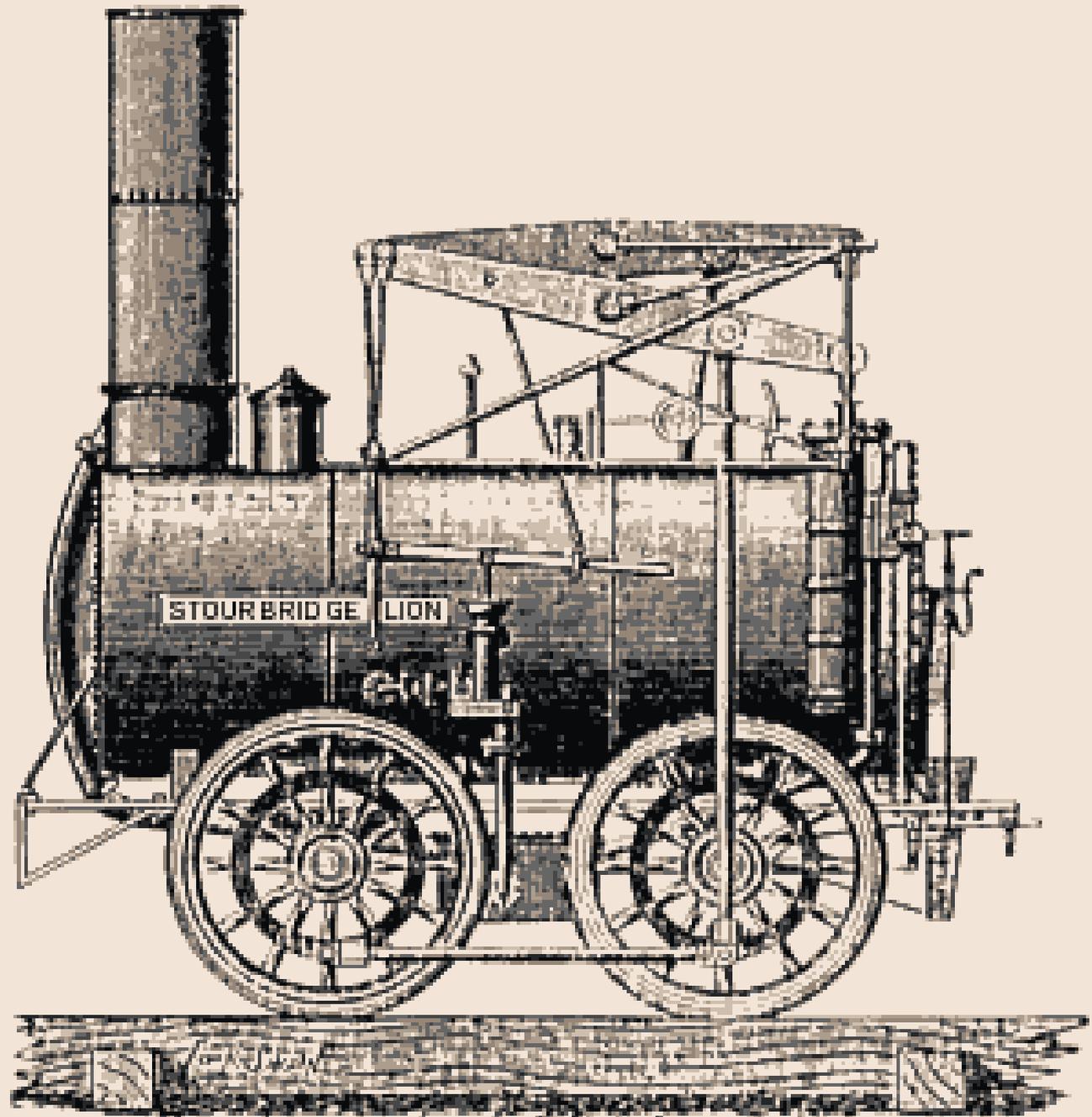
Transportation innovations

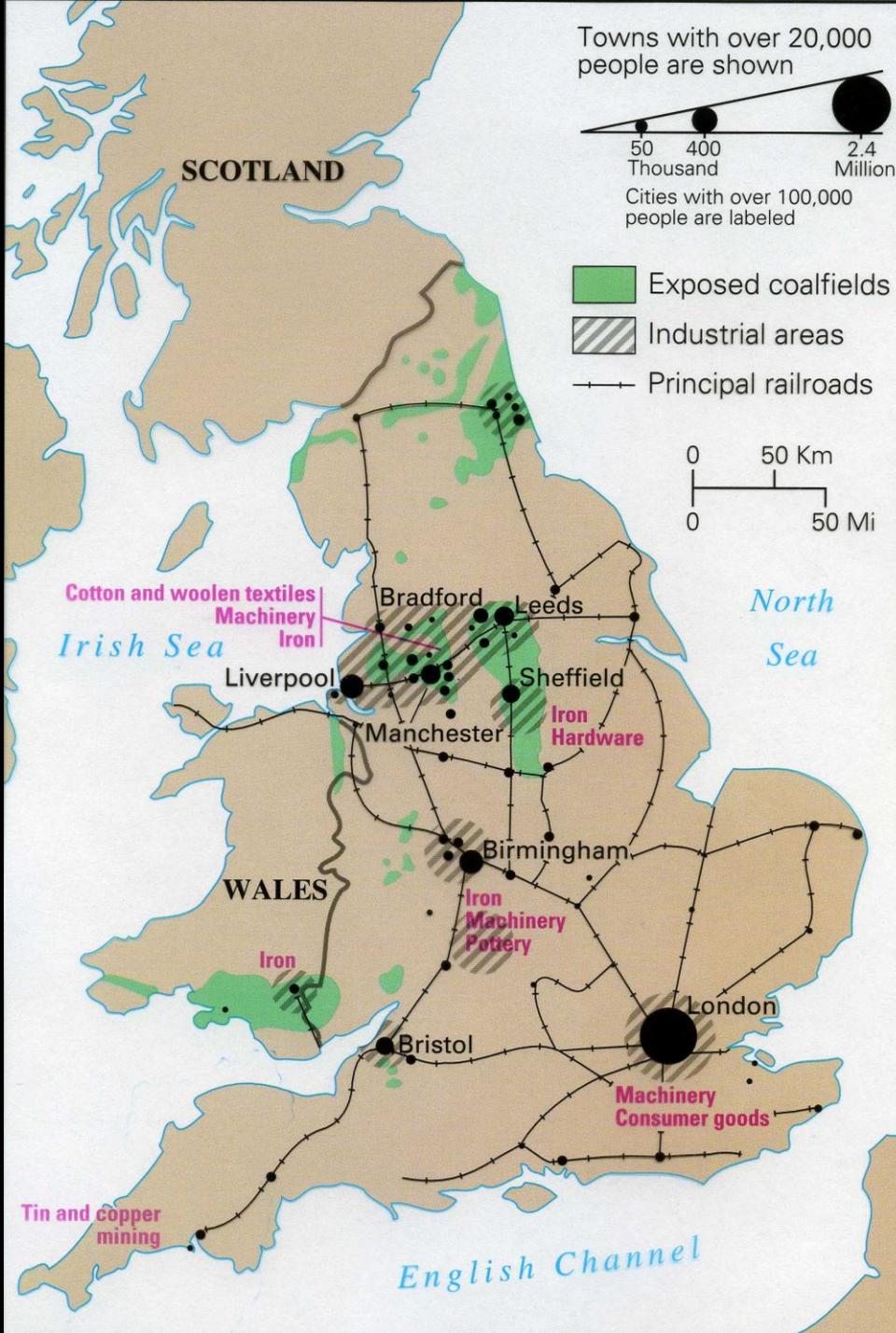
- Needed way to transport goods to and from factories
- Steam engine, originally invented to pump water out of mines, led to railways
 - Cheap transportation for goods
 - Hundreds of thousands of new jobs for railroad workers and miners
 - New industries as offshoots: produce
 - Movement of people, leisure travel

Thomas
Newcomen's
Steam Engine



Early Steam
Locomotive





Spread of Industrialization

- Spread to Continental Europe, USA, Russia, and Japan
 - 1820's USA, but delayed by lack of labor & capital
 - Civil war initially slowed down but eventually sped up industrialization
 - 1830's – Belgium
 - 1850's – Germany
 - 1880-1890 – Russia & Japan

