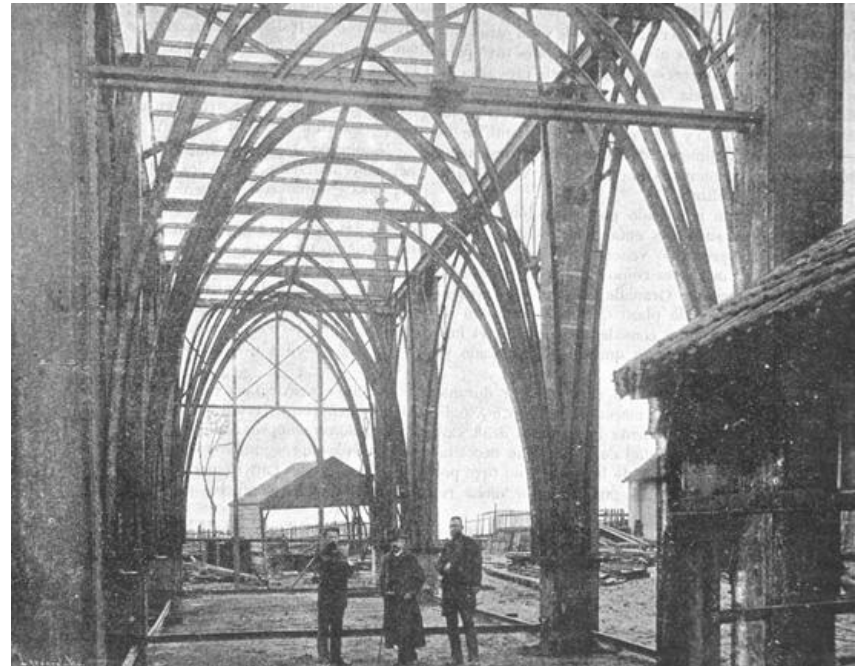


# Industrial Revolution

The Industrial Revolution began in Great Britain. The U.S. and Germany were the next two countries to industrialize.



# Why in Britain?

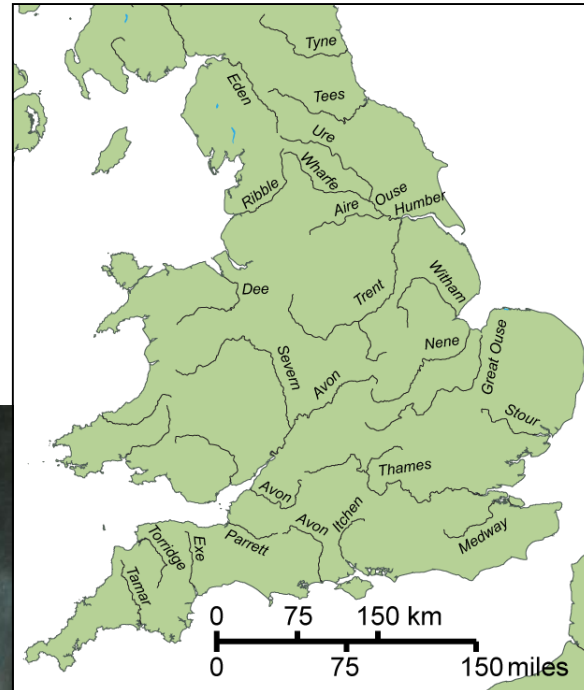
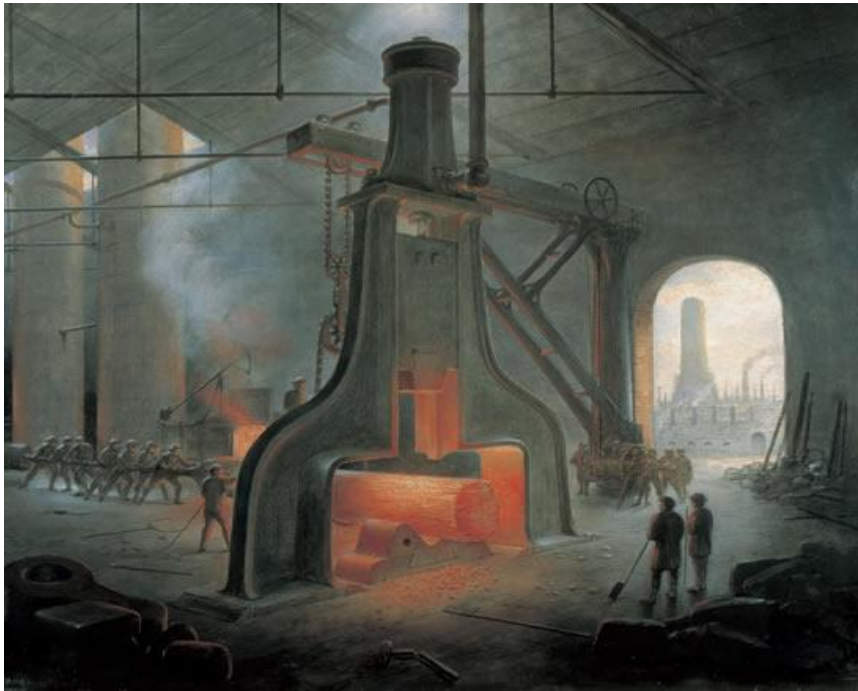
## Great Britain's advantages:

- Natural Resources
- Capital
- Infrastructure
- Entrepreneurs
- Supportive Government
- Labor



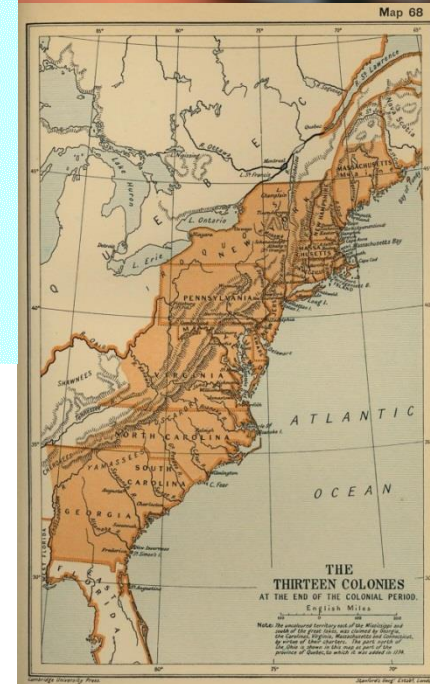
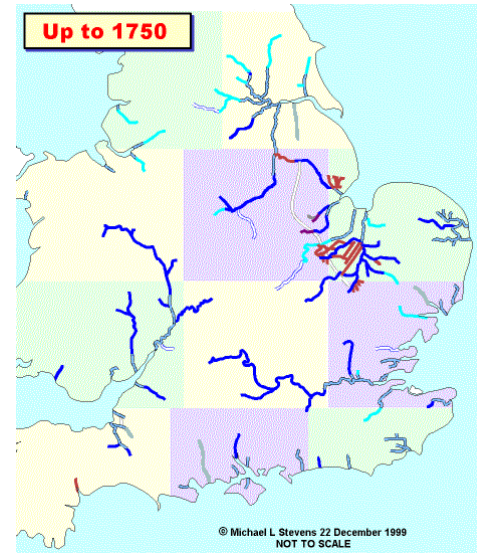
# Natural Resources

- Plentiful iron and coal
- A navigable river system



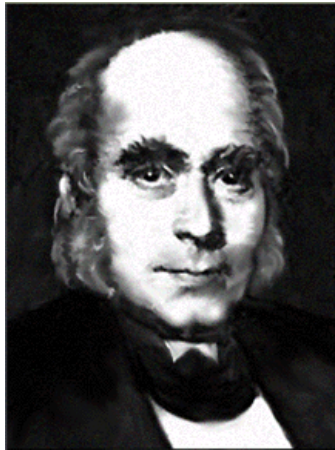
# Capital and Infrastructure

- A strong commercial bank system provided merchants with capital (money) to invest in new enterprises
- Colonies supplied raw materials and bought finished goods
- Infrastructure—the canals, buildings, roads, etc., that are necessary to conduct business



# Entrepreneurs

People willing to take the risk to go into business for the sake of earning profit.



Henry Bessemer

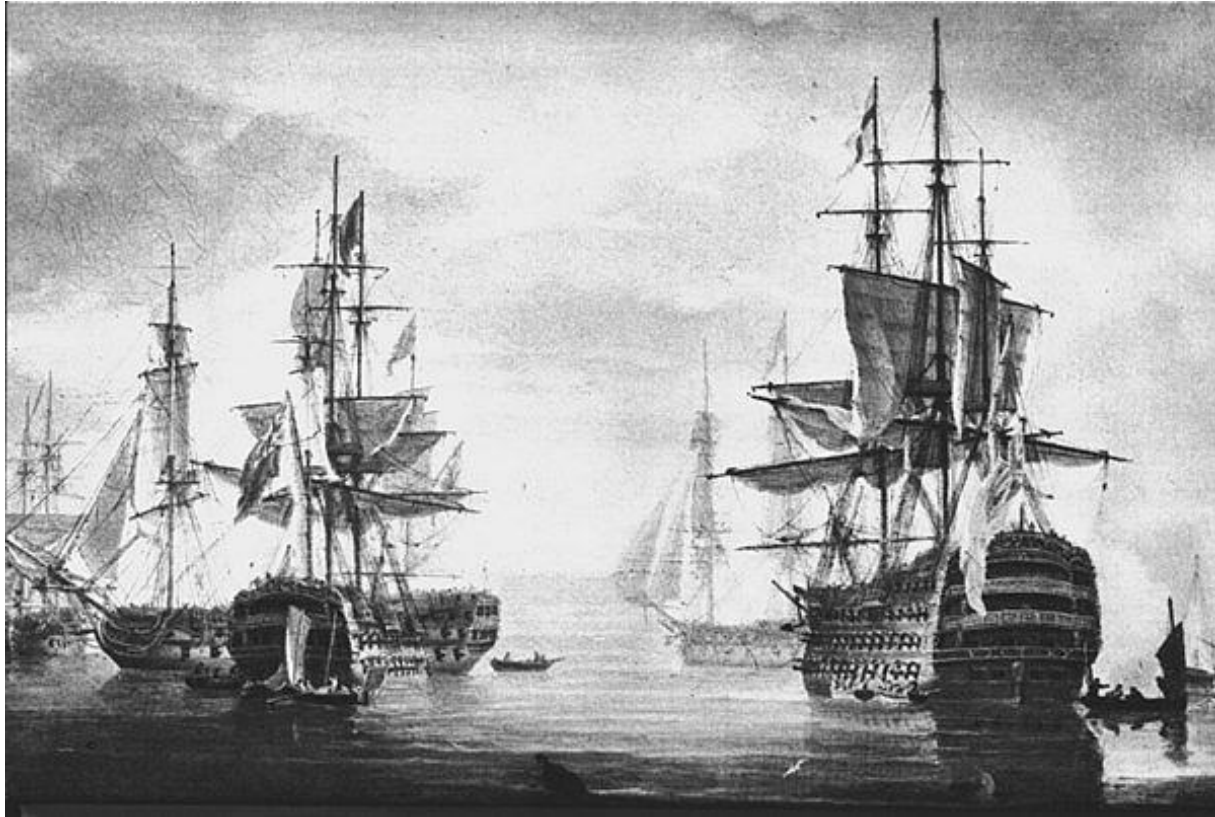
The Bessemer converter for producing STEEL



© 2002 historypictures.com

# Supportive Government

- A government that encouraged improvements in transportation and used its navy to protect British trade



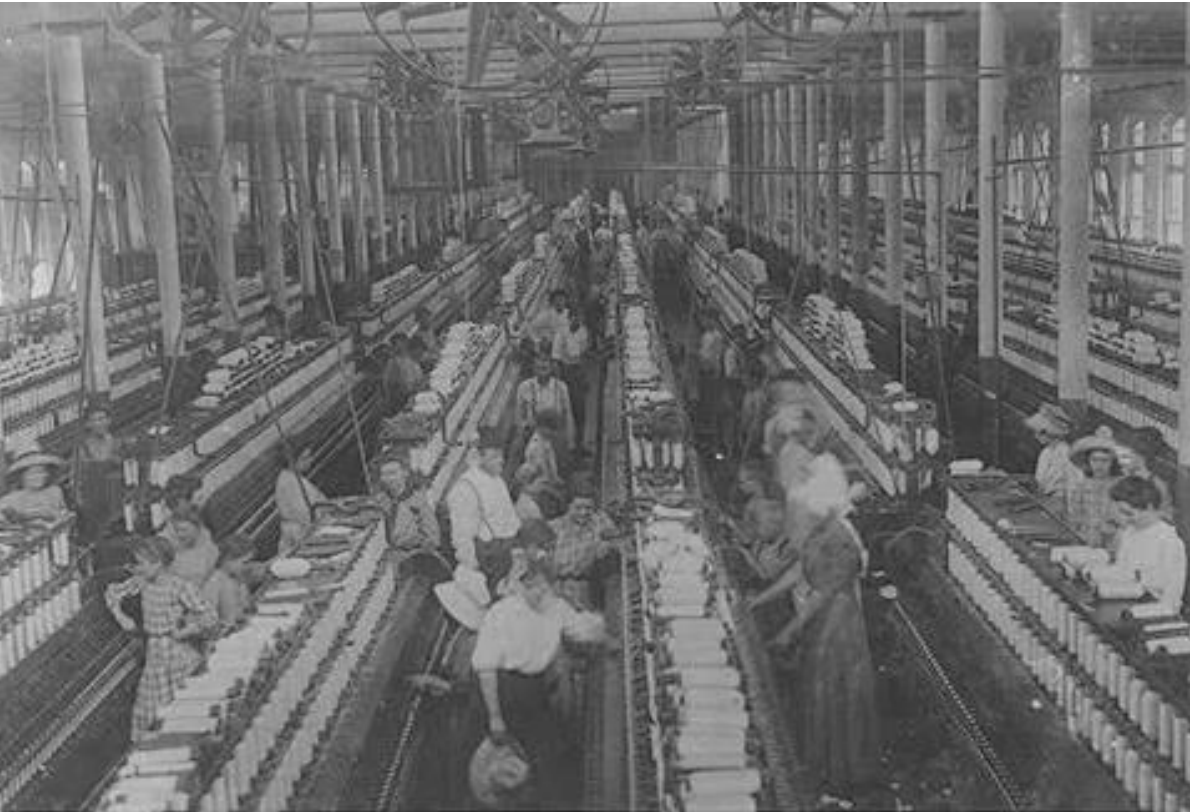
# Enclosure Movement

With advances, landowners wanted to control land in order to make more money

- Fenced in land that had been available for public use by small farmers/villagers
- Smaller part of population worked as farmers, more people available for industrial work
- Urbanization: People moved to cities



# LABOR



- Plenty of workers as a result of
  - Enclosure Movement
  - Population growth



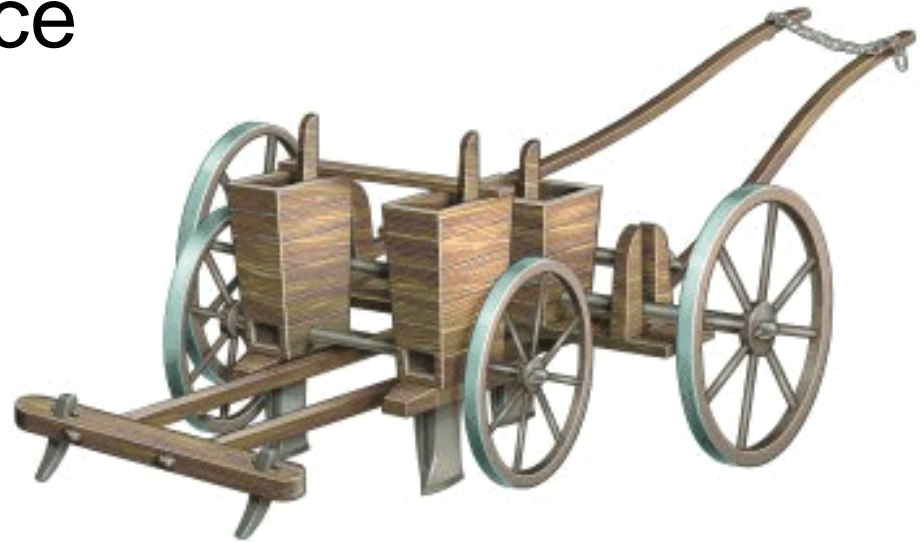
# Agricultural Inventions

- Seed Drill-----
- Crop Rotation-----
- Improved Breeding --- methods
- Mechanical reaper----
- Horse-drawn hoe
- Replaceable plow blades
- Cotton gin---- Eli Whitney
- Jethro Tull
- Charles Townshend
- Robert Bakewell
- Cyrus McCormick



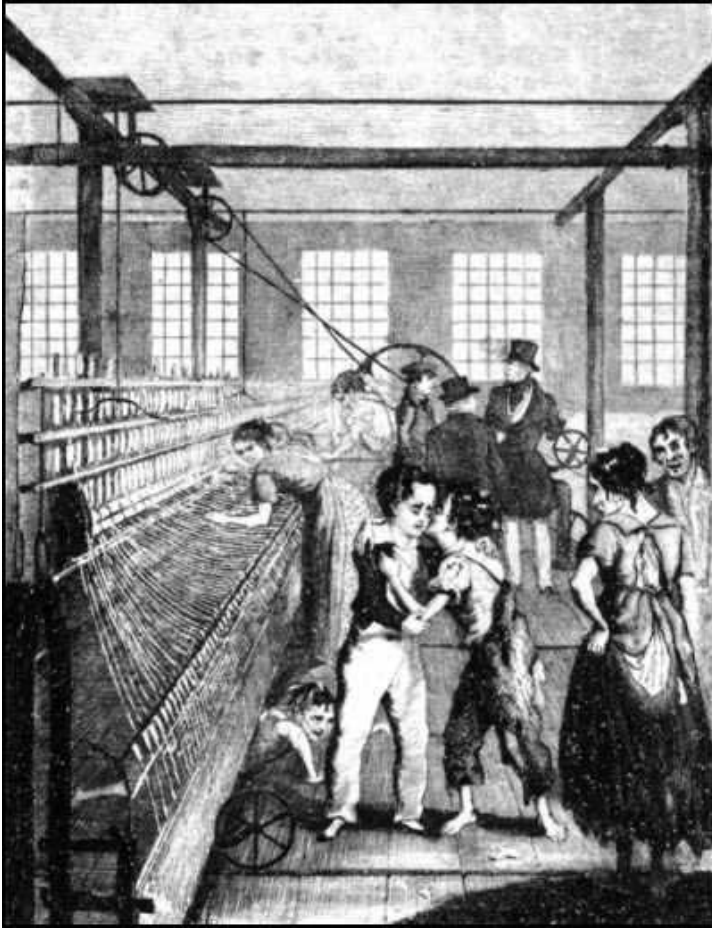
# Agricultural Inventions— What difference did they make?

- [Enclosure Movement]
  - Increased labor force
  - Urbanization
- More production
- Led to increased population
- Increase in income—  
more spending money



Seed Drill

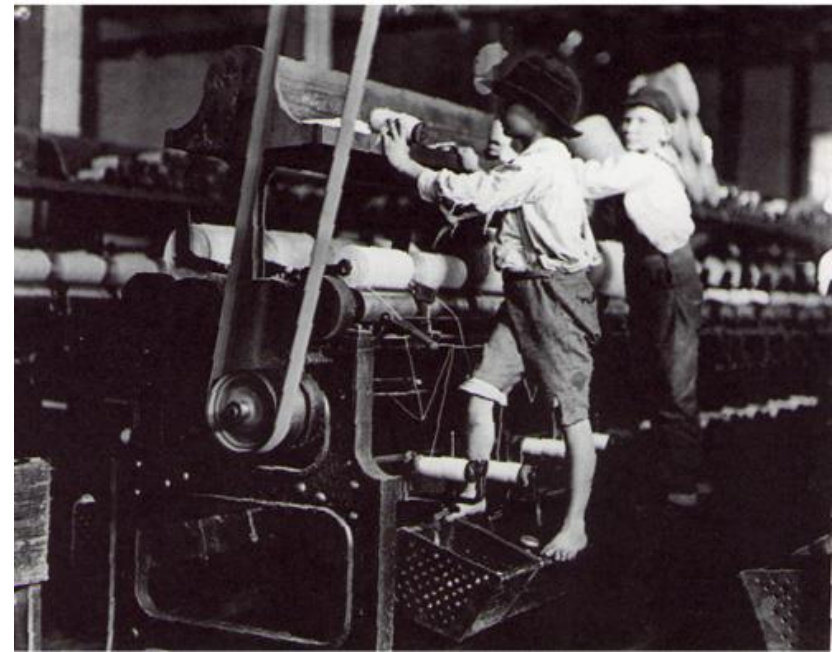
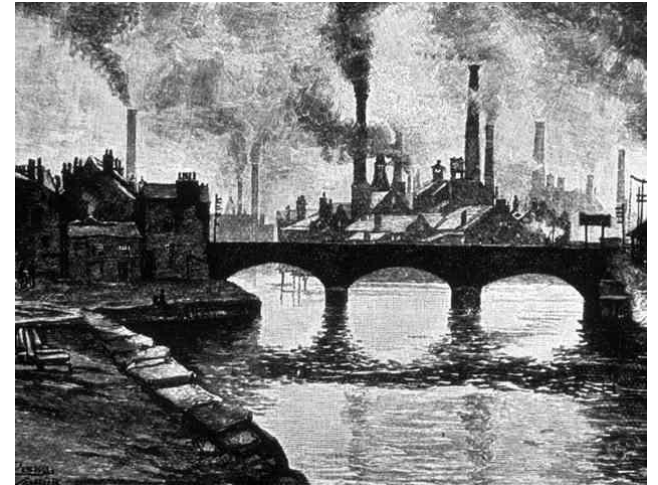
# Textiles



- Cotton gin--Eli Whitney
- Flying shuttle—John Kay
- Spinning jenny—  
James Hargreaves
- Water-powered loom--  
Edmund Cartwright
- Factory System—  
Richard Arkwright
- Sewing Machine—  
I.M. Singer

# What difference did these make?

- FACTORY SYSTEM  
(instead of Cottage Industry)
- Women and children to work
- Urbanization
- Pollution
- Cotton gin—led to greater demand for slave labor



# Transportation

- Steam Engine
  - Thomas Newcomen
    - \*\*James Watt
- Locomotives
- Steamboats (Robert Fulton)
- Stone-topped roads



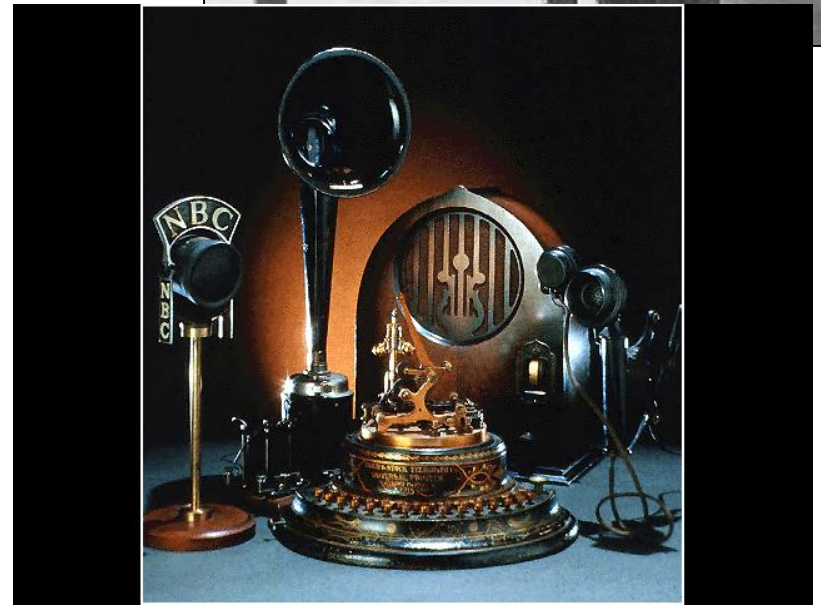
# What difference did it make?

- Easier long-distance travel
- Long-distance shipping of trade goods
- Settlement of American West



# Communication

- Telegraph (and Morse Code)
  - Invented by Samuel Morse
- Telephone
  - Inv. by Alexander Graham Bell
- Radio
  - Inv. by Guglielmo Marconi



# What difference did it make?

- Faster communication over long distances made a difference in
  - government
  - war/military actions
  - business
  - entertainment
  - personal communication



Telegraph Wagon. Taken in 1864 by David Knox  
[old-photos.blogspot.com/2007\\_05\\_01\\_archive.html](http://old-photos.blogspot.com/2007_05_01_archive.html)



# Medicine



- Inoculation against smallpox (and later, other diseases)—  
Edward Jenner
- Safer surgery with disinfectants—  
Joseph Lister
- Anesthetics—  
William Morton

# What difference did it make?

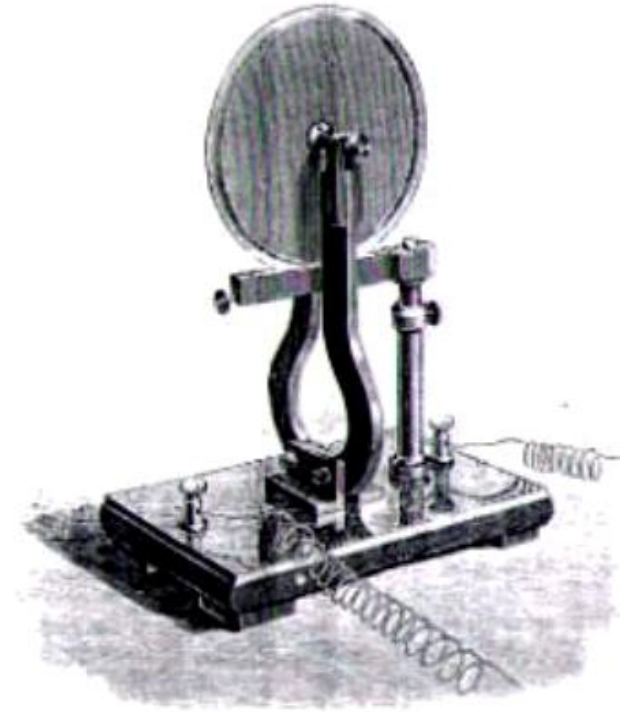
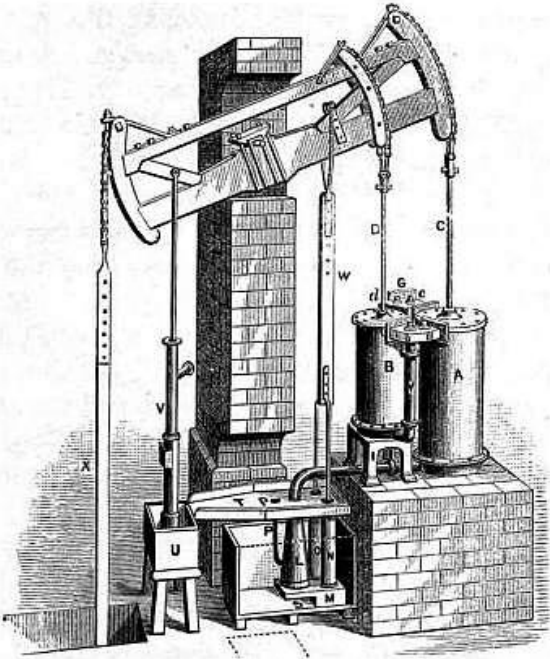
- Improvements in sanitation promoted better public health
- An increase in the food supply meant fewer famines and epidemics, especially as transportation improved
- Population increase

# Science/Technology

- Louis Pasteur—  
microbiology/bacteria
- Marie Curie—chemistry/radiation
- Charles Darwin—  
biology/evolution
- Albert Einstein—physics/ theory  
of relativity
- Ernest Rutherford—chemistry/  
discovered the atom
- Henry Bessemer—steel-making  
process

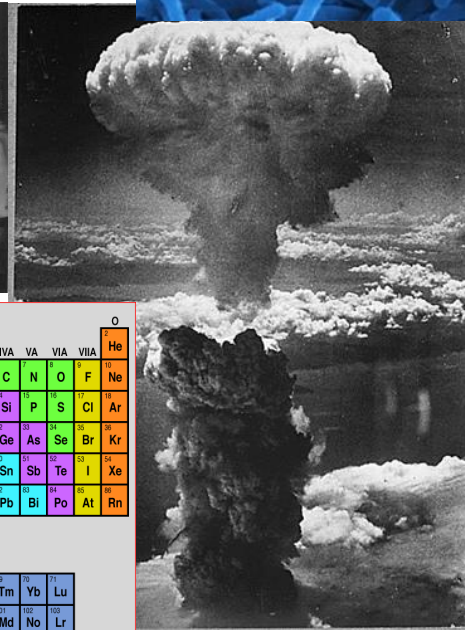
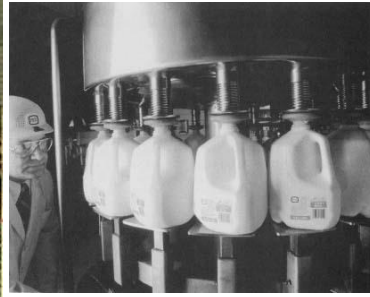
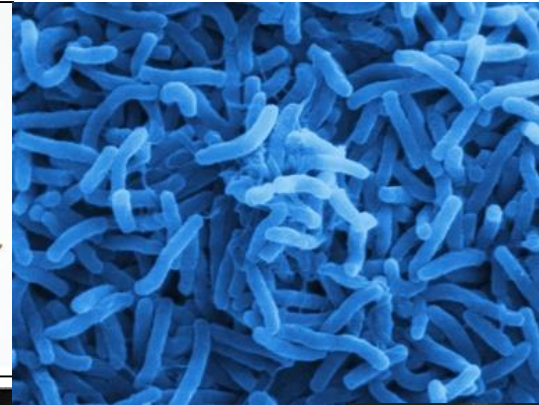
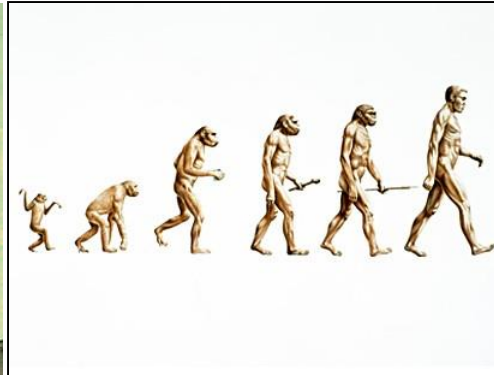


# Technology



- Michael Faraday's Dynamo/Electric Generator
- James Watt's Steam Engine
- Thomas Edison's Electric Light Bulb

# What difference did it make?



Periodic Table of the Elements

|   |    |    |                     |    |    |    |    |    |    |     |     |     |     |    |    |    |    |    |    |  |
|---|----|----|---------------------|----|----|----|----|----|----|-----|-----|-----|-----|----|----|----|----|----|----|--|
| 1 | 2  |    |                     |    |    |    |    |    |    |     |     |     |     |    |    |    |    | 10 | 11 |  |
| 1 | H  |    |                     |    |    |    |    |    |    |     |     |     |     |    |    |    |    | He | 2  |  |
| 2 | Li | Be |                     |    |    |    |    |    |    |     |     |     | B   | C  | N  | O  | F  | Ne | 10 |  |
| 3 | Na | Mg |                     |    |    |    |    |    |    |     |     |     | Al  | Si | P  | S  | Cl | Ar | 18 |  |
| 4 | K  | Ca | Sc                  | Ti | V  | Cr | Mn | Fe | Co | Ni  | Cu  | Zn  | Ga  | Ge | As | Se | Br | Kr | 36 |  |
| 5 | Rb | Sr | Y                   | Zr | Nb | Mo | Tc | Ru | Rh | Pd  | Ag  | Cd  | In  | Sn | Sb | Te | I  | Xe | 54 |  |
| 6 | Cs | Ba | *La                 | Hf | Ta | W  | Re | Os | Ir | Pt  | Au  | Hg  | Tl  | Pb | Bi | Po | At | Rn | 86 |  |
| 7 | Fr | Ra | +Ac                 | Rf | Ha | Sg | Ns | Hs | Mt | 110 | 111 | 112 | 113 |    |    |    |    |    |    |  |
|   |    |    | * Lanthanide Series |    |    |    |    |    |    |     |     |     |     |    |    |    |    |    |    |  |
|   |    |    | Ce                  | Pr | Nd | Pm | Sm | Eu | Gd | Tb  | Dy  | Ho  | Er  | Tm | Yb | Lu |    |    |    |  |
|   |    |    | + Actinide Series   |    |    |    |    |    |    |     |     |     |     |    |    |    |    |    |    |  |
|   |    |    | Th                  | Pa | U  | Np | Pu | Am | Cm | Bk  | Cf  | Es  | Fm  | Md | No | Lr |    |    |    |  |

# What difference did it make?

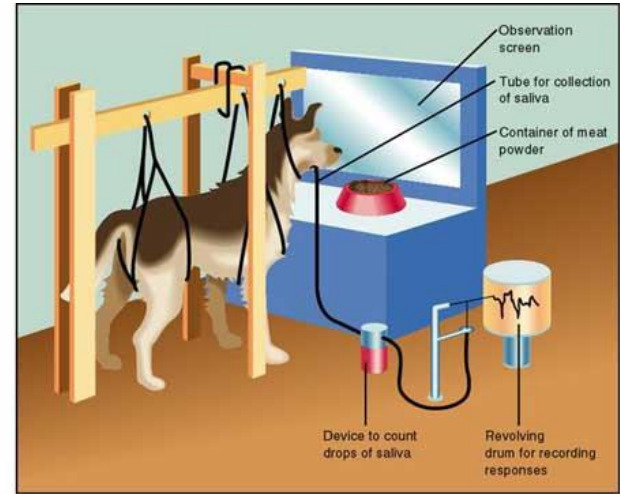
- Mechanization
- Factories
- Electric lights—  
changed daily  
lifestyle/ rhythm of  
days and nights



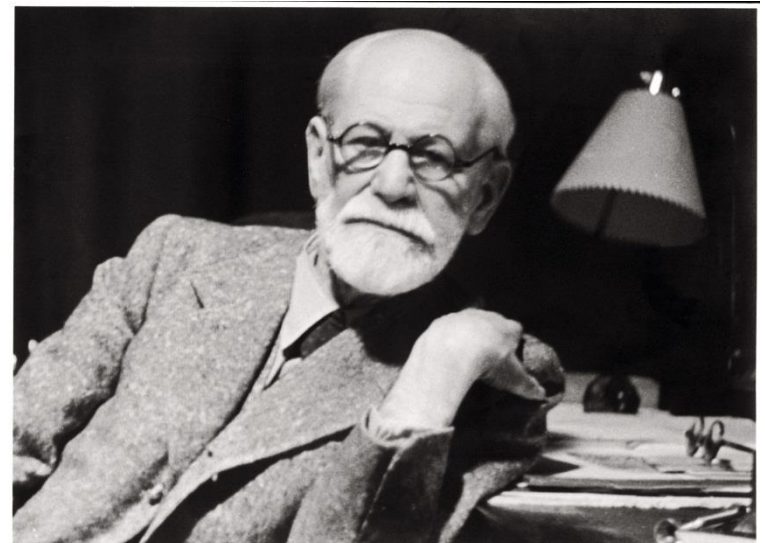
**Carbon arc searchlights beaming out of the  
Electric Building at  
Chicago's 1893 Exposition**  
<http://einhornpress.com/electric.aspx>

# Psychology

Ivan Pavlov—Human behavior



Sigmund Freud—  
Unconscious mind/  
--psychoanalysis



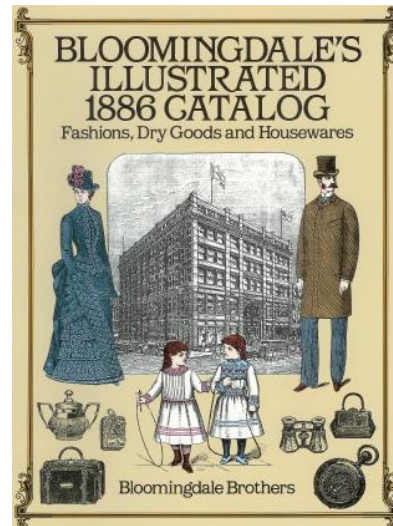
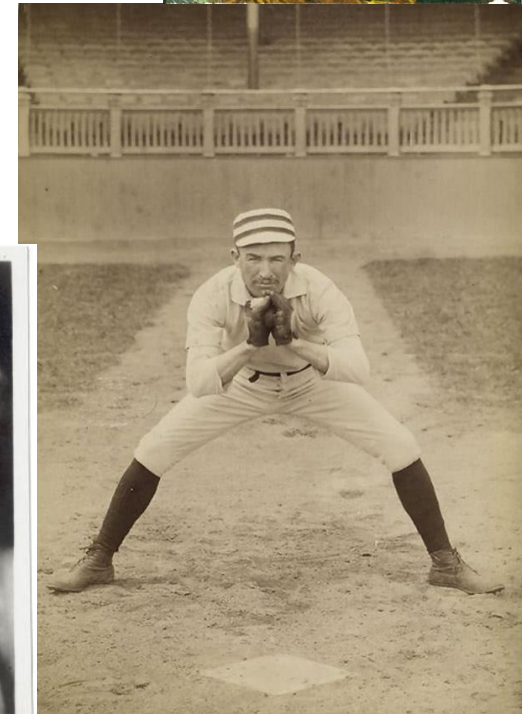
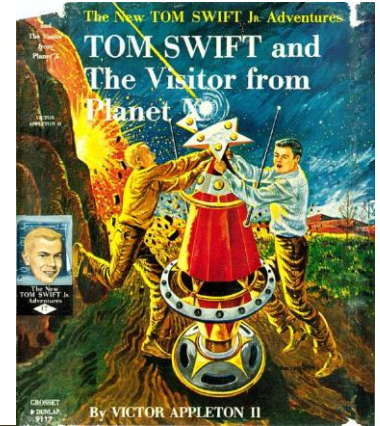
# What difference did it make?

- Challenged the fundamental ideas of the Enlightenment—that reason was supreme and people could perfect themselves and their society by use of reason



# Entertainment

- Mass produced culture
- Music halls/movies
- Sports
- Books for entertainment



# What difference did it make?

- American-led, development of a clearly American culture
- Leisure time became a bigger priority