The Industrial Revolution

1815-1914: A Century of Transition

CHY - The West and the World
Focus Question

- What impact did the Industrial Revolution in Great Britain have on people’s lives socially and economically?
Life Before the Industrial Revolution

- Britain: 1st to generate an appreciable and ever-increasing surplus of food and goods

- Sustained and self-sustaining economic growth leads to unprecedented growth of population

- Lives of all except kings, large landowners, upper clergy, and small merchant and professional elites tended to be “solitary, poor, nasty, brutish, and short” (Thomas Hobbes)

- Infant mortality was high
Background

- The industrial Revolution began in Great Britain in the 1780s; between the American War of Independence (1775-1783) and the French Revolution (1789-1799)

- However it would not affect continental Europe until after 1815

- 18th C - Europe experiencing rapid population growth (Britain - 9 Million in 1780 to 21 million in 1850)

- Some historians argue that the full impact of the industrial revolution was not felt until the 1830s-40s
Beginnings

- The Industrial Revolution wasn’t a “revolution” and wasn’t planned

- England was the first country to initiate technological change.
  - They did so without models to copy or research to forecast change

- England pioneered industrial technology, social relation reforms, and revolutionized urban living
Why Britain First?

- Britain had relative freedom from external threat
- Breakdown of religious monopoly after the Reformation allowed for free flow of knowledge
- Property rights were much more advanced, resulting in much greater social mobility than the rest of Europe
- Better transport, constantly upgrading (locks, roads, canals, and eventually railroads)
- Expanding export trade creates mass market and helps raise the standard of living
Agents of Industrialization

- Industrialization was made possible through a variety of forces:
  - Technical Discoveries
  - Entrepreneurs
  - Government
  - Banks
Agents of Industrialization

- The British tried to keep their technical discoveries secret by making it illegal for skilled mechanics to leave Britain.

- **Entrepreneurs** helped stimulate the demand for products and promoted economic development.

- **Governments** provided tariff protection and monetary support for the building of national projects to improve travel and transport.

- **Banks** modified their own practices to reduce risk and better facilitate business ventures.
Entrepreneurs

- The expanding Atlantic economy served mercantilist Britain well.
- Britain had both foreign markets and domestic demands, as well as limitless resources that could be shipped by sea.
- These conditions were idea for aspiring entrepreneurs.
- Agriculture was important and English farmers were second only to the Dutch in terms of productivity.
The monarchy and the aristocratic oligarchy provided stable and predictable government.

The gov’t sponsored and shouldered the cost of public projects that included building roads, railways, bridges and tunnels.

The gov’t imposed few controls, encouraged personal initiative, technical change, and a free market.
Banks

- Prior to the Industrial Revolution Britain had an effective central bank and well developed credit markets

- Banks created ‘limited liability’ reducing risk and, thus, attracting shareholders

- They helped facilitate interest in business ventures by increasing their financial support services
Workers

- Britain’s rural wage earners were relatively mobile compared to the village-bound peasants in France and Germany.

- Britain had a large class of hired agricultural labourers and rural proletarians readily available.

- BUT... technological advancement did not favour everyone. Some jobs became redundant or obsolete. Angry workers destroyed machines as a revolt ("Luddites")
Factories

- Rapid population growth created larger markets, which called for the creation of large factories.

- The first factories were in the cotton textile industry in the 1770s.

- Factories were initially located in rural areas where they had access to water power but moved to the cities with the invention of efficient steam engines.
Machines

- 1765 - James Hargreaves invents cotton-spinning jenny
- 1765 - Richard Arkwrite invents water frame
- 1790 - Samuel Compton invents spinning machine that did not require manual work using the human arm.

- By 1790 the new machines were producing 10 times more cotton yarn than in 1770
Cotton

- Cotton textiles came to Britain by way of the East India Company
- Industries made cotton goods quickly and companies sold them cheaper
- Before, only the wealthy could afford to buy body linen (underwear), now everyone could!
- Weavers became more valuable and among the best paid workers in England
Energy

- Prior to Industrial Revolution, energy was supplied by manual means, by water (mills), and by burning wood

- Rapid population growth + decrease in homegrown timber = energy crisis

- Breakthrough! Steam engine powered by coal to power machinery

- Thomas Savery (1698) and Thomas Newcomen (1705) invent first primitive steam engines
Technological Advancements

- Primitive steam engines were relatively inefficient.
- James Watt created a condenser to improve the steam engine’s performance by reducing the cooling process.
Technological Advancements

- Watt’s new and improved steam engine is the Industrial Revolution’s most fundamental advancement

- Replaced waterpower as the primary source
  - Waterforce varied with the seasons, factories/mills had to be located on suitable streams
Technological Advancements

- Watt’s innovation promoted breakthroughs in other industries, most importantly in the iron industry.

- 1780s - Henry Cort developed the “puddling furnace”, allowing pig iron (weaker form of iron) to be refined using coke (derived from coal) which was unlimited as opposed to using charcoal for heat.
Cottage Industry vs. Factory System

- Production of goods begins to shift from cottage industry where entrepreneur provided raw material to the home worker, then sold the finished product
  - “putting-out system”

- Factory System: power-driven machinery was faster, more efficient, and larger and more expensive than anything in the home or small workshops
Railroads

- 1825 - George Stephenson build an effective locomotive using the steam engine

- 1830 - his ‘Rocket’ sped down the track of the recently completed Liverpool-Manchester railway at 16 miles per hour

- This was the first important railroad and was situated in the heart of industrial England
Railroads

- Railroads - significant because they dramatically reduced the cost and uncertainty of shipping freight over land

- Barrier of high transportation costs was reduced, enabling markets to grown to nation-wide proportions

- Larger markets = later factories = cheaper production costs for people of all classes

- Railroads created work and allowed people to get to places where work could be found
Working Conditions

- The first factories appeared in the 1770s, set up in rural areas (close to power supply - water).

- Cottage workers did not find factory work appealing, resulting in the hiring of children.

- By 1790 this pattern changes, the use of pauper children is forbidden by parliament in 1802

- Factories move to cities where steam power replaces water power and workers are in ready supply.
Working Conditions

- Work conditions in the early stages of the Industrial Revolution were poor
  - Air was toxic in factories and mines
  - Machinery was not built with safety in mind
  - Work days were long and without breaks
  - Treatment of workers was unregulated
  - Along with ventilation, lighting was poor
  - Work areas were filthy and cramped
Working Conditions

- After the 1790s, women and children made up an increasing portion of the work force in factories and mines.

- Entrepreneurs could pay them less and dominate them more effectively than they could men.
Division of Labour

- Prior to Industrial Revolution people worked in family units, roles defined by sex

- With technological advancements and the need for labour, jobs were made available to anyone

- Specialized work and skills emerge, new pattern of “separate spheres” established the male as the primary wage earner
Child Labour

- Many adults found factory work unappealing
- Factories resembled poorhouses where destitute workers made little pay
- Factory owners turned to employing young children
- Many were orphans or were “apprenticed” by local parishes to save money
- Without guardians, children worked in slave-like conditions
Child Labour

- Children were apprenticed as young as 5 or 6 years of age.

- Boys and girls were forced by law to work for their master for as many as 14 years.

- Many were housed, fed, and locked up in the factory dormitories.

- Subject to abuse, many children would miss meals, worked without shoes, lost fingers or limbs, ingested toxic fumes, and often died.
Social Conditions

- In the early stages of the industrial revolution there was little time for recreational or family life outside the workplace.
- Workers were stressed and resorted to alcohol as a means of coping.
- Chronic fatigue led many to sleep in public if their homes were far from work.
- Living conditions in the city deteriorated due to crowding and poor sanitation.
Social Conditions

- In the cities, overcrowding, poverty, and the sudden release from traditional rural religious and social restraints led to widespread illegitimacy, alcoholism, and prostitution.

- A dramatic increase in life-expectancy reflected the paralleled rise in real income.

- The relative gap between the rich and the poor widened: the rich grew richer faster than the poor.
New Social Structure

- Old social groups were weakened and new ones created
- Rise of a new business elite undermined the social power of the nobility
- Middle class expanded rapidly
  - Entrepreneurs
  - Lawyers, doctors, bureaucrats, professors, white collar workers
  - Industrial workers, domestic servants
  - Landless rural peasants, pickpockets, prostitutes, beggars
Social Conditions
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The reality of factory life and corresponding conditions prompted government intervention.

1833 - Factory Act
- Limited workday for children between 9-13 to 8 hours per day; teenagers between 14-18 to 12 hours per day
- Prohibited children under 9 from working; enrolled in elementary schools established by factory owners
Child Labour in the Industrial Revolution

http://www.youtube.com/watch?v=kfuUoINOU5I
Focus Question: Revisited

- What impact did the Industrial Revolution in Great Britain have on people’s lives socially and economically?
Conclusion

- The Industrial Revolution had a significant impact on the development and growth of commerce.

- This benefited all people regardless of class.
  - Created jobs and affordable goods
  - Prompted gov’t to reconsider the negative impact of technological change on workers and families.
Reflection

- In your opinion, what were the major impacts of the Industrial Revolution? What do you think was the single most important factor that allowed the Industrial Revolution to emerge?

- Explain the role of children in the Industrial Revolution. How were they treated? How did some factory owners often perceive them? What ‘improvements’ did they experience following government intervention?

- Describe the working conditions during the Industrial Revolution. How would they compare to the working conditions of today?